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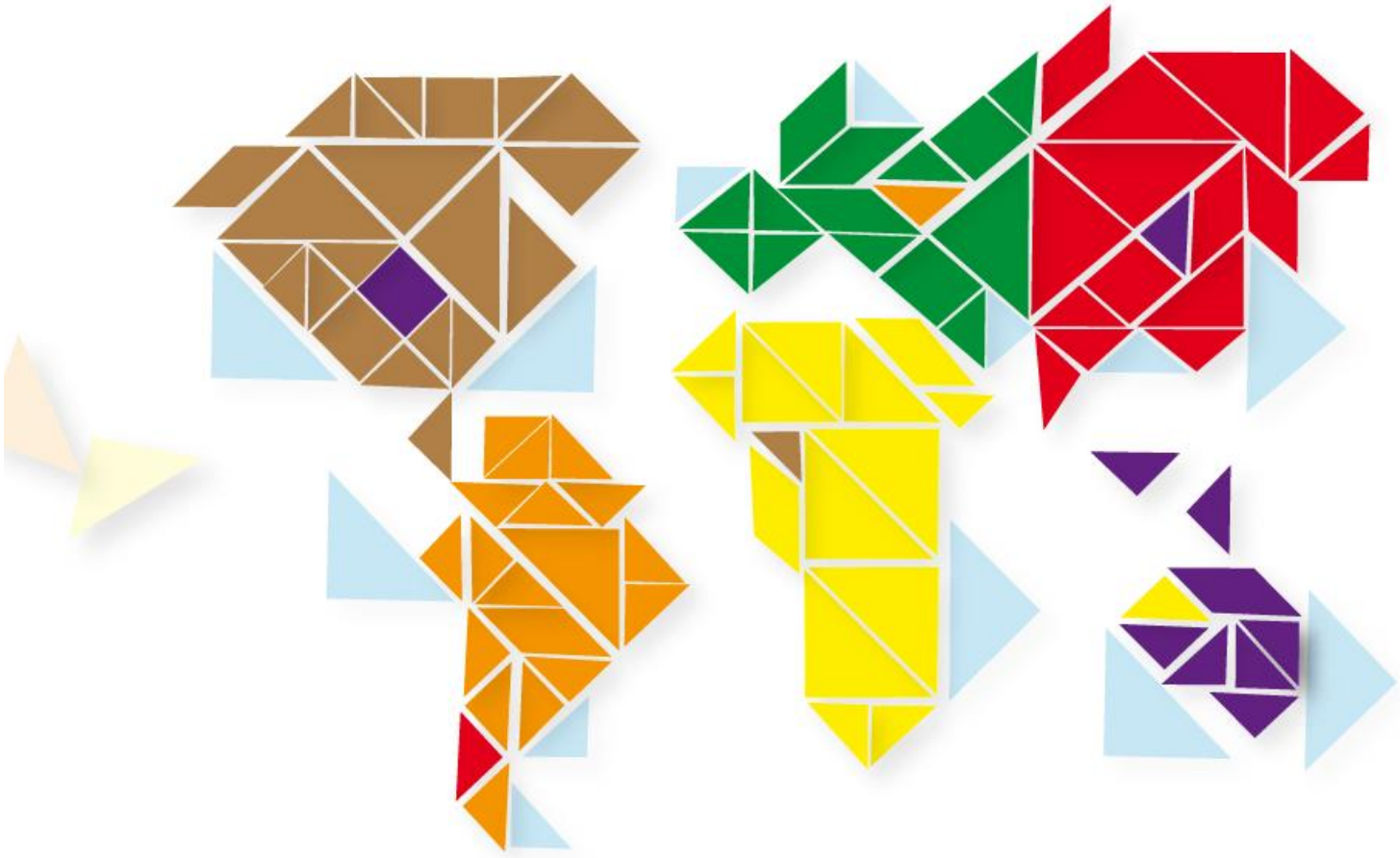

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SOMMARIO
TABLE OF CONTENTS

3. SESSIONE 2

LA RICERCA COME LEVA PER LO SVILUPPO: APPROCCI ED ESPERIENZE

4. SESSIONE 3

IL RUOLO DELLE UNIVERSITÀ NEI PROGETTI GOVERNATIVI E NON GOVERNATIVI DI COOPERAZIONE

5. SESSIONE 4

IMMIGRAZIONE: MULTICULTURALISMO E NUOVE STRUTTURE SOCIOECONOMICHE

6. SESSIONI SPECIALI

7. SESSIONE POSTER

EDITORIALE - PRESENTAZIONE DEL N. 1/2018

Egidio Dansero*, Francesca De Filippi**, Emanuele Fantini***, Carlo Semita*

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Care lettrici e cari lettori di JUNCO,

siamo lieti di ospitare in questo nuovo numero gli Atti del convegno CUCS di Milano, svoltosi nel settembre 2017, sul tema "Migrazioni, pace e sviluppo. Nuove sfide e nuovi volti per la cooperazione".

JUNCO è nato in occasione del convegno CUCS svoltosi a Torino nell'ottobre del 2013 e con gli Atti di CUCS Milano 2017 continua nel suo ruolo di documentazione e divulgazione del dibattito scientifico sui temi della cooperazione allo sviluppo.

Il numero, la diversità e la qualità dei contributi testimonia l'interesse e la crescita di una comunità di riflessione e di pratica che si è consolidata nel tempo e che coinvolge oltre al mondo accademico molteplici partner del mondo della cooperazione, sia in Italia sia nei paesi di intervento.

Questi Atti riaffermano il ruolo che il CUCS ha svolto, sia attraverso seminari e incontri di coordinamento tra le università e in particolare le delegati e i delegati dei Rettori, sia attraverso i convegni biennali (Pavia 2009, Padova 2011, Torino 2013, Brescia 2015 e Milano 2017), in vista del prossimo convegno di Trento 2019 che si preannuncia ricco di riflessioni e partecipato.

MIGRAZIONI, PACE E SVILUPPO. NUOVE SFIDE E NUOVI ATTORI NELLA COOPERAZIONE INTERNAZIONALE PER LO SVILUPPO IN ITALIA.

V CONGRESSO DEL COORDINAMENTO UNIVERSITARIO PER LA COOPERAZIONE E LO SVILUPPO (CUCS)

Guido Sali*, Emanuela Colombo**

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Premessa

La cooperazione allo sviluppo oggi è chiamata a rispondere a nuove emergenze derivanti dai tanti mutamenti degli assetti sociali, politici e ambientali sulle comunitàin molte parti del mondo con particolare riferimento alle aree fragili.

La cooperazione deve essere sempre più strumento valoriale della politica di un paese. Più cooperazione per combattere la povertà, ma anche per perseguire la pace, per garantire lo sviluppo, per governare in modo sano ed equo le migrazioni.

Le frontiere della cooperazione si estendono a nuovi orizzonti e diventa quanto mai indispensabile sistematizzare l'azione facendo sì che gli attori coinvolti, dalle istituzioni pubbliche al mondo delle imprese, dalla società civile al sistema universitario trovino linguaggi comuni e strumenti condivisi idonei a elaborare politiche e azioni efficaci ad affrontare vecchie e nuove povertà, crescenti instabilità, inaspettati bisogni sociali.

Alcune Università Italiane, in sinergia con la CRUI e la DGCS del MAECI hanno avviato d tempo una riflessione sul ruolo della formazione e della ricerca nello sviluppo. Riflessione che ha trovato risposte a livello nazionale nella Legge 125 dell'Agosto 2014 e a livello internazionale nell'Agenda 2030 che riconosce il mondo accademico come un attore chiave nello sviluppo

Questo il cuore del dibattito che si è svolto a Milano in occasione del V Congresso Nazionale del CUCS il Coordinamento Universitario per la Cooperazione e lo Sviluppo organizzato e ospitato dall'Università degli Studi e il Politecnico di Milano.

Il coordinamento Universitario per la Cooperazione allo Sviluppo

Il Coordinamento Universitario per la Cooperazione allo Sviluppo (CUCS) si costituisce formalmente nel 2007 con un protocollo d'intesa a cui aderiscono attualmente più di 30 università

italiane. Il CUCS si inserisce in un lungo e articolato processo di dialogo avviato tra il mondo universitario e la Direzione Generale Cooperazione allo Sviluppo del Ministero degli Affari Esteri e oggi aperto a tutto il Sistema Italia della Cooperazione allo Sviluppo.

Le università del CUCS ritengono di essere chiamate a coprire un ruolo innovativo e concreto nel potenziamento della cooperazione internazionale allo sviluppo. Profonda è la riflessione sulle direzioni verso cui ampliare i confini della missione accademica in termini di ricerca e di trasferimento di conoscenza o di tecnologia per allinearla alle nuove sfide globali. A livello mondiale, infatti, l'Agenda 2030 di sviluppo delle Nazioni Unite e i 17 Obiettivi di Sviluppo Sostenibile da essa declinati rappresentano sfide complesse e multidisciplinari che spronano gli attori della cooperazione a individuare differenti e sinergici ruoli per proporre strategie efficaci, efficienti, di impatto e ben validate attraverso processi di monitoraggio e valutazione solidi e trasparenti.

A queste considerazioni, si aggiunge a livello italiano, il contesto della cooperazione nazionale che, a partire dalla L.125/2014 apre un quadro di riferimento in cui la cooperazione diventa elemento qualificante per l'intera politica estera del paese e dove al ruolo degli attori più tradizionali come le organizzazioni della società civile, la cooperazione territoriale e gli organismi internazionali si potrà affiancare quello di altre esperienze e competenze provenienti dal mondo universitario e della ricerca e dal settore privato.

Ruolo dell'Università nel Sistema della Cooperazione Italiana

L'intervento del sistema universitario nella cooperazione allo sviluppo ha acquisito negli anni un ruolo via via più rilevante parallelamente al crescere dell'esigenza di migliorare l'efficienza e l'efficacia delle iniziative di partenariato messe in atto con gli altri attori della cooperazione, delineando un sistema nel quale istituzioni, società civile, imprese e università hanno ormai trovato una collocazione precisa e ruoli complementari nell'affrontare i temi dell'aiuto allo sviluppo. In questo quadro il ruolo dell'università è cresciuto proprio in virtù del processo di riequilibrio del fulcro decisionale, spostatosi dal paese donatore alla partnership bilaterale, rovesciando il processo di trasferimento (di tecnologie, di risorse finanziarie, di competenze) a favore della crescita endogena e della condivisione dei saperi, fino alla elaborazione di sintesi culturali nuove ed originali. Una spinta fondamentale in tale senso è derivata anche dal bisogno di favorire la crescita del capitale umano attraverso la formazione, gli scambi di studenti e docenti, l'allacciamento di rapporti sempre più stretti tra università sul fronte della ricerca e della didattica.

Parallelamente è ormai prassi consolidata da parte delle organizzazioni, governative e non, avvalersi del supporto universitario per le fasi di analisi ed elaborazione dei problemi, così come per la verifica ex ante ed ex post dei progetti elaborati.

Il coinvolgimento universitario nei progetti di sviluppo locale a fianco della cooperazione non governativa ha consentito l'elaborazione di metodologie di intervento basate sulle "tecnologie appropriate", soluzioni non improntate ai criteri di efficienza propri dei paesi industrializzati, ma in grado di adattarsi al sistema di vincoli strutturali delle realtà in cui devono essere implementate. Il sistema universitario opera all'interno del perimetro delle proprie competenze e della propria missione, valorizzando e qualificando nel contempo l'azione della cooperazione, dotandola di una solida impostazione metodologica e mettendo a disposizione competenze, strutture e tecnologie.

Sul fronte dei partenariati con le istituzioni governative, l'università è chiamata a ricoprire un ruolo di cerniera tra l'individuazione del problema e la predisposizione di strategie per affrontarlo. E' a questo livello che si riscontrano le attività di cooperazione dell'università nel campo delle grandi strutture sanitarie e dei programmi di lotta alle malattie endemiche, dei progetti di sviluppo agricolo ed energetico, di tutela e valorizzazione delle risorse culturali (archeologiche, linguistiche, etnografiche, ecc.), fino alla predisposizione e realizzazione di progetti di istruzione universitaria e di alta formazione.

Le riflessioni degli ultimi dieci anni hanno potato il CUCS ha proporre un triplice ruolo per la cooperazione accademica

- Arricchire i percorsi formativi con nuove professionalità, sia in studenti italiani destinati ad un'attività (diretta o indiretta) nel mondo della cooperazione internazionale sia in studenti dei Paesi partner da preparare e specializzare nel nostro Paese e/o nel loro paese di origine in specifiche aree professionalizzanti. Questa urgenza formativa va intesa anche come risposta all'esigenza di dotare le economie dei paesi meno sviluppati di strumenti e politiche in grado di prevenire l'insorgere di crisi derivanti da shock esterni (economici, ambientali, politico-sociali). Uno dei modi per raggiungere questo scopo è l'implementazione ed il potenziamento dei programmi di interscambio già esistenti, mediante l'istituzione di borse di studio da offrire ai giovani dei Paesi partner per periodi di studio in Italia (congiunto con le università locali ove possibile) e ai nostri giovani che intendano impegnarsi nelle Istituzioni internazionali di cooperazione allo sviluppo.

- Contribuire allo sviluppo e al rafforzamento di capacità istituzionali ponendo l'università in triangolazione con il settore pubblico e privato, valorizzando sia la creazione indigena di attività imprenditoriali/artigianali che il patrimonio di relazioni scientifiche internazionali già in atto. Le

relazioni che le università hanno con analoghe istituzioni di alta formazione e ricerca in tutto il mondo rappresentano una rete inestimabile di conoscenza reciproca e di dialogo. Molti atenei italiani hanno contribuito e tuttora contribuiscono attivamente a formare la generazione di professionisti e dirigenti in molti Paesi partner. Tali azioni diventano volano di sviluppo per ulteriori future relazioni per il nostro Paese in ambito privato o pubblico.

- Offrire la conoscenza maturata nelle rispettive discipline e mettere a disposizione avanzati strumenti di ricerca scientifica destinati a produrre innovazione per lo sviluppo e a elaborare metodi e modelli di valutazione degli interventi che siano allineati allo stato dell'arte delle buone pratiche internazionali. L'Università vanta una consolidata tradizione di cooperazione scientifica caratterizzata dal dialogo con gli interlocutori locali, in una prospettiva di apprendimento reciproco. In tal senso la ricerca scientifica diventa strumento per lo sviluppo e può essere utilizzata per innovare le pratiche della cooperazione e migliorarne l'efficacia, mediante l'elaborazione di modelli di sviluppo e di trasferimento tecnologico appropriati, partecipati e in grado di creare sviluppo autonomo. In secondo luogo l'Università può dare un valido contributo ad un'approfondita ed efficiente analisi dei risultati e dell'impatto degli interventi di cooperazione. In particolare gli atenei possono essere valutatori disponibili, competenti, istituzionali, in grado di assicurare un elevato grado di obiettività scientifica – nel quadro dei principi OCSE-DAC -, e possono mettere a punto, a seconda della tipologia di intervento o programma, le più appropriate e moderne metodologie di valutazione.

La struttura del Convegno

Il congresso ha voluto celebrare il decennale del Coordinamento Universitario Cooperazione e Sviluppo e porrà l'accento sul nesso tra migrazioni, pace e sviluppo alla luce dei pilastri della missione accademica:

– formazione e capacity building: le università devono preparare professionisti di grande competenza in grado di svolgere un ruolo più attivo, da attori protagonisti, nelle trasformazioni della società, nel Nord e nel Sud del Mondo e partecipare al processo di costruzione di capacità istituzionali nei paesi partner;

– ricerca e innovazione: la ricerca deve mirare a modelli di sviluppo appropriati, partecipati e in grado di creare sviluppo autonomo. Servono pratiche di cooperazione caratterizzate dal dialogo con gli interlocutori locali, metodi e modelli più efficaci sia per valutare l'impatto di lungo periodo delle azioni di cooperazione, sia per indirizzare le strategie future;

– diplomazia scientifica: le relazioni scientifiche che le università hanno nel mondo diventano un'occasione di incontro e di dialogo tra culture e così il trasferimento tecnologico e l'innovazione della conoscenza diventano sempre più strumenti condivisi per uno sviluppo umano e sostenibile.

Prima giornata

Il via ai lavori è stato dato in Via Festa del Perdono alla presenza dei rettori Gianluca Vago (UniMI) e Ferruccio Resta (PoliMI) e con la partecipazione di Anna Scavuzzo del Comune di Milano e Fabrizio Sala di Regione Lombardia e di Andrea Carignani, della Direzione Generale Ricerca della Commissione Europea.

La prima giornata del convegno è stata anche occasione per l'allora Vice Ministro del MAECI con delega alla Cooperazione Internazionale, Mario Giro, di effettuare una tappa del suo tour universitario "Cooperazione internazionale - Il nostro futuro nel mondo". Il tour voleva portare suggerimenti professionali ai giovani, universitari e diplomandi, interessati al mondo della cooperazione internazionale eillustrare tutte le opportunità di lavoro che la Cooperazione internazionale offre ai giovani, incluse le modalità di accesso alle borse di studio offerte dall'Agenzia Italiana per la Cooperazione allo Sviluppo.

Una sessione speciale, molto tecnica sul tema delle migrazioni ha chiuso la prima giornata parlando di strumenti di tutale e approccio multidimensionale.

Seconda giornata

La seconda giornata si aperta al Politecnico di Milano e ha visto l'organizzazione di 4 sessioni in parallelo a cui è seguita una tavola rotonda molto partecipata da varie rappresentanze del mondo della cooperazione.

Il convegno ha avuto il patrocinio del Ministero degli Affari Esteri e della Cooperazione Internazionale, di Regione Lombardia, del Comune di Milano, della Conferenza dei Rettori delle Università Italiane, della The World Academy of Sciences. Inoltre, in occasione del Convegno il Presidente della Repubblica ha voluto consegnare al Convegno la Medaglia riservata ad eventi di particolare valore civile, segno dell'apprezzamento delle istituzioni all'iniziativa.

Programma 14 settembre 2017 Università degli Studi di Milano – Via Festa del Perdono, 7 – Aula Magna

10:00-11:00 Sessione di apertura - Saluti istituzionali

Gianluca Vago, Rettore, Università degli Studi di Milano

Ferruccio Resta, Rettore, Politecnico di Milano

Anna Scavuzzo, Comune di Milano

Fabrizio Sala, Regione Lombardia

Andrea Carignani, DG Research and Innovation, Commissione europea

11:00-13:00 **Sessione plenaria**: Migrazioni, pace e sviluppo. Nuove sfide per la cooperazione

Chairman: Massimo Galli, Università degli Studi di Milano

Gianni Vaggi, Università degli Studi di Pavia, The evolution of the notions of development: a personal view.

Romain Murenzi, The World Academy of Sciences, Science as a builder of peace.

Mario Giro, Ministero degli Affari Esteri e Cooperazione Internazionale, Le nuove sfide della Cooperazione Internazionale.

Discussant: Gabriele Pasqui, Politecnico di Milano

13:15-14:30 Pausa

14:30-16:30 **Incontro del Vice Ministro Mario Giro** con i giovani delle università milanesi Modera: Massimo Zaurrini, Africa e Affari

16:30-18:30 **Sessione speciale** "Immigrazione irregolare: strumenti di tutela e approccio multidimensionale" Coordinano: Umberto Triulzi, Università di Roma "La Sapienza", Nerina Boschiero, Università degli Studi di Milano

Elena Sciso, Luigi Prosperi, Centro di ricerca sulle organizzazioni internazionali ed europee, Luiss Guido Carli, Il traffico di migranti dalla Libia come crimine contro l'umanità: nuove prospettive per la repressione sul piano nazionale e internazionale.

Alessia Di Pascale, Università degli Studi di Milano, The EU Policy on return: instruments and shortcomings.

Paolo Bargiacchi, Università degli Studi di Enna "Kore", Elementi di una possibile convergenza del modello di sicurezza europeo verso quello statunitense nella gestione dei flussi misti irregolari.

Maria Teresa Trapasso, Università di Roma "La Sapienza", The punishment for migrant smuggling in the italian legal system.

Giulia Vicini, Università degli Studi di Milano, Dal Decreto Minniti alle riforme europee: il diritto dell'immigrazione diventa securitario.

Simona Ragazzi, Tribunale di Catania, Il contrasto penale al traffico di migranti nel Mediterraneo nell'esperienza italiana: strumenti, efficacia e prospettive. Discussione

Programma 15 Settembre 2017 Politecnico di Milano Aula Magna , S13, S15, Piazza Leonardo Da Vinci 1 Auditorium, Viale Romagna 62

9:00-11:00 Sessioni parallele

Sessione 1 – Aula Magna: L'Università nei partenariati multilaterali per la cooperazione allo sviluppo

Coordinano: Egidio Dansero, Università degli Studi di Torino, Francesca De Filippi, Politecnico di Torino

Alberto Brugnoli and Alessia Pastorutti, Multi-Stakeholder Partnerships and Subsidiarity Approaches: Cases and Proposals for Sustainable Development

Navarro Ferronato, Vincenzo Torretta, Guido Zolezzi, Marco Bezzi and Marco Ragazzi, International Cooperation and University Agreements: New Opportunities for a Sustainable Development

Serena Massa, Nelly Cattaneo and Susanna Bortolotto, Past landscapes to shape future societies: research in the Horn of Africa

Flavio Bertinaria, Marco Pedretti Dal Covolo, Silvia Tomasi and Andrea Pronti, Participatory Assessment of Sustainability: the Agroecological Case in Central America

Silvio Cristiano, Camilla Falchetti and Francesco Miacola, Cooperationbeyonddevelopment. Rethinking international aid for the self-determination of recipient communities.

Emanuela Colombo and Lorenzo Mattarolo, The Italian Multi-stakeholder Platform and the guidelines for "Energy and Development"

Camilla Falchetti, Silvio Cristiano and Alfredo Mela, Failingwhilesucceeding? On the delicate effects of a yet sincere cooperation.

Valerio Bini, Egidio Dansero, Andrea Magarini, Yota Nicolarea and Roberto Sensi, The role of cooperation amongst cities, universities, research bodies and civil society organizations Food on Urban Policies in Africa as innovative actions in the cadre of the Milan Urban Food Policy Pact

Alessandra Zanelli, Knowledge transfer into a system design process: the case study of S(p)eed kits - rapid deployable kits as seeds of self-recovery

Francesco Garbati Pegna, Pietro Bartolini, Lhoussaine El Rhaffari, Soumia Fahim, Enrico Bonaiuti, Quang Bao Le and Claudio Zucca, Sustaining Moroccan oasis agricultural system through small mechanization inputs

Sessione 3 – Aula S15: Il ruolo delle Università nei progetti governativi e non governativi di cooperazione Coordinano: Gian Battista Parigi, Università degli Studi di Pavia, Massimo Zortea, Università degli Studi di Trento

Stefano Corsi, Luigi Orsi, Ivan De Noni and Francesca Mapelli, Innovative development model: collective actions and social enterprises. The cashewvalue chain in Sierra Leone

Carlo Cerini, Nerisia Da Nelola Mauricio Tique, Benedetta Rossi, Nigritella Brianese, Paola Zanotti, Paola Lanza, Bruno Comini, Silvio Caligaris, Lina Tomasoni and Francesco Castelli, Estimated access to care of patients with HIV infection in rural communities in Mozambique

Francesco Roncallo, Elisa Ferrara and Alberto Traverso, Community involvement in a low cost biogas plant in an Andean region

Andrea Carlo Lonati, Ilaria Polloni, Filippo Ciantia, Thomas Odong and Mirella Pontello, Strategic Planning process in a general rural hospital: an experience at Dr. Ambrosoli Memorial Hospital, Uganda

Pietro De Marinis, Giacinto Manfron, Arianna Facchi, Giorgio Provolo and Guido Sali, Remote Sensing and landsecurization in Nord Kivu, DRC

Marta Domini, Silvia Gibellini, Lavinia Difrancesco, Antonella Vidoni, Francesca Villa, Sabrina Sorlini and Mentore Vaccari, The challenge of sharing data in cooperation projects: cause for reflection

Maria Nannini, Mario Biggeri, Giovanni Putoto and Gavino Maciocco, Programming interventions on Community Health Insurance: a Feasibility Case Study in Uganda

Giulia Lanzarini, Stefano Bolzonello, Valeria Pecchioni, Micol Fascendini and Marilena Bertini, Servizi sanitari e attività artistiche per coinvolgere i giovani nella lotta contro la migrazione irregolare in Etiopia

Sessione 4 - Auditorium: Immigrazione: multiculturalismo e nuove strutture socioeconomiche Coordinano: Alberto Brugnoli, Università degli Studi di Bergamo, Francesca Declich, Università di Urbino

Pietro Barbetta, Arianna Barazzetti, Rita Finco and Paolo Pressato, Ethnoclinic: Languages, Migrations, Identities

Maria Vittoria Calvi, Plurilinguismo e azione sociale nel paesaggio linguistico milanese

Sandro Rinauro, Labour market and migratory flows in Italy during the current economic crisis

Alberto Brugnoli, Matteo Matteini, Circular Economy, Migration and Development: Italy and Countries with Strong Migratory Pressure

Franco Locatelli, Alessia Montanari, Chiara Schiavo, Sabina Tangerini, Mattia Viano and Marilena Bertini, La competenza culturale in ambito sanitario

Marco Pastori and Maria Alessandra Verrienti, A possible alternative to illegalmigration in South Wollo, Ethiopia

11:00-13:00 **Sessione speciale** - Aula Magna: "Didattica e formazione nella cooperazione allo sviluppo. Metodologie e approcci" Coordinano: Francesco Castelli, Università degli Studi di Brescia, Donatella Taramelli, Università degli Studi di Milano

Giorgio Guariso and Giacomo Toffano, A model of the role of education in 2015 UN international migration data

Carlo Semita, Elena Ferrero, Angela Calvo, Abdourahamane Balla, Malloum Soultan and Florent Lankoande, The Project RUSSADE (Network of Sahelian Universities for Food Security and Environmental Sustainability): the role of universities as engines of development

Zeno Gaburro, Training a new generation of leaders for Africa

Stefano Corsi, Marco Fiala, Gabriella Giovanelli, Teaching Agriculture and Food Science in Sierra Leone between continuity and inconsistency

Alessandro Villari and Sebastiano Nucifora, Complex networks, simple solutions. The University between education and new job opportunities in international cooperation projects

Federica Tarabusi and Arianna Taddei, Professional Changes and new Challenges in the field of International Aid

Maurizio Marceca, L.M. Salvatori, "Irregular" Migration and Health: implications for protection and education policies

13:00-14:30 Light Lunch

14:30-15:30 Aula Magna - Sintesi delle sessioni

15.30-17.30 Aula Magna - **Tavola rotonda: "Il sistema italiano della cooperazione: nuove sfide e nuovi volti"** Modera Gianfranco Belgrano, Direttore Editoriale Info Africa. Partecipano:

Rita Mannella, DGCS; Bernardo Bini Smaghi, Cassa Depositi e Prestiti; Enrico Materia, AICS; Silvia Stilli, AOI; Giampaolo Silvestri, AVSI, CNCS; Emanuela Colombo, Politecnico di Milano; Guido Sali, Università degli Studi di Milano.

SESSIONE 1

L'UNIVERSITÀ NEI PARTENARIATI MULTILATERALI PER LA COOPERAZIONE ALLO SVILUPPO

INTRODUZIONE

Egidio Dansero*, Francesca De Filippi**

* Università degli Studi di Torino
** Politecnico di Torino

La cooperazione allo sviluppo è oggi chiamata a rispondere a nuove emergenze per l'impatto dei mutamenti degli assetti sociali, politici e ambientali sulle comunità in molte parti del mondo, in particolare quelle più fragili.

La sessione "*L'Università nei partenariati multilaterali per la cooperazione allo sviluppo"* del V Convegno CUCS ha adottato, come focus principale, il ruolo dei partenariati, in particolare dalla prospettiva dell'accademia, nel dialogo e collaborazione con la società civile, le istituzioni pubbliche e private impegnati in programmi e progetti di cooperazione allo sviluppo. L'obiettivo è individuare possibili linguaggi comuni e strumenti condivisi per elaborare politiche e azioni efficaci ad affrontare le prossime sfide che pongono dinnanzi vecchie e nuove povertà, crescenti instabilità, inaspettati bisogni sociali.

Sono state selezionate dal Comitato Scientifico 10 comunicazioni, di cui 9 presentate al Convegno. I contributi alla sessione offrono un panorama vario e articolato intorno al tema dei partenariati multilaterali per la cooperazione allo sviluppo: metodi e approcci nella Cooperazione per la Cooperazione; modelli di partnership e ruolo delle Università, metodi e strumenti di trasferimento/condivisione della conoscenza con i Paesi del Sud Globale.

Metodi e approcci nella Cooperazione per la Cooperazione

Il contributo di Silvio Cristiano, Camilla Falchetti e Francesco Miacola, "*Cooperation beyond development. Rethinking international aid for the self-determination of recipient communities"*, presenta gli esiti di un Seminario Partecipativo organizzato al Politecnico di Torino, articolato in quattro tavoli di lavoro (autodeterminazione e reciprocità, emergenza e sviluppo, formazione, co-progettazione / progettazione partecipata), e propone una riflessione critica sui temi cardine della cooperazione, sugli obiettivi reali e apparenti, sugli effetti, sui vincitori e i vinti dell'aiuto internazionale.

Il paper di Camilla Falchetti, Silvio Cristiano e Alfredo Mela, "*Failing while succeeding? On the delicate effects of a yet sincere cooperation",* pone al centro i possibili approcci per valutare gli effetti delle azioni di cooperazione sulle popolazioni destinatarie. Partendo da un'esperienza guidata dal mondo accademico in un'area interna rurale di El Salvador (America centrale), il contributo intende stimolare la discussione su come la cooperazione internazionale possa servire realmente e unicamente gli interessi dei destinatari, il loro potenziamento strategico e - soprattutto - la loro autodeterminazione.

Partenariati multilaterali. Il ruolo dell'Università.

Nel paper di Navarro Ferronato, Vincenzo Torretta, Guido Zolezzi, Marco Bezzi e Marco Ragazzi, "*International Cooperation and University Agreements: New Opportunities for a Sustainable Development"* è presentato un caso interessante di partenariato universitario, per lo studio di problematiche ambientali, che apre la collaborazione con enti locali, Ong e imprese private. L'analisi evidenzia il ruolo importante che possono giocare gli accordi universitari, se fattivi, operativi e ben impostati, tra Atenei italiani e Istituzioni universitarie di Paesi a reddito medio-basso.

Valerio Bini, Egidio Dansero, Andrea Magarini, Yota Nicolarea e Roberto Sensi, in *"The role of cooperationamongstcities, universities, researchbodies and civil society organizations Food on Urban Policies in Africa as innovative actions in the cadre of the Milan Urban Food Policy Pact",* propongono una riflessione sul possibile ruolo della cooperazione allo sviluppo e in particolare della cooperazione decentrata degli enti locali, con il supporto dell'Università, nell'ambito delle politiche urbane del cibo, contesto inedito di confronto e collaborazione meno asimmetrica tra città del Nord e del Sud del mondo.

Emanuela Colombo e Lorenzo Mattarolo, in "*The Italian Multi-stakeholder Platform and the guidelines for Energy and Development*", illustrano l'iniziativa, promossa dalla Cattedra UNESCO per l'energia per lo sviluppo sostenibile presso il Politecnico di Milano, che prevede l'attivazione di una "piattaforma multi-stakeholder per l'energia nello sviluppo", prima esperienza pilota nazionale di collaborazione multi-attori (enti pubblici, settore privato, società civile, istituzioni accademiche e di ricerca) con obiettivo di identificare, formulare e convalidare le strategie di intervento in linea con l'SDG7. La piattaforma è in coordinamento con l'Agenzia italiana per la cooperazione allo sviluppo e con la Direzione generale per la cooperazione allo sviluppo del Ministero degli Affari Esteri e della Cooperazione Internazionale.

Il paper *"Participatory Assessment of Sustainability: the Agroecological Case in Central America",* di Flavio Bertinaria, Marco Pedretti Dal Covolo, Silvia Tomasi e Andrea Pronti, illustra gli esiti di

un progetto in America centrale nell'ambito del programma UniCoo, frutto di una collaborazione tra l'Università degli Studi di Torino e l'Ong Rete. In particolare vengono descritte le fasi del processo partecipativo che ha coinvolto gli stakeholder più rilevanti al fine di giungere a una definizione condivisa di sostenibilità e mettere a punto uno strumento per la valutazione dei sistemi agro-ecologici basato su indicatori e facilmente fruibile.

Conoscenze locali e condivisione/trasferimento di saperi

Il paper di Blal Adem Esmail e Davide Geneletti, "*Knowledge transfer and capacity building: an example from the urban water sector"* mette in evidenza gli ambiti chiave in cui l'Università può dare un contributo concreto, principalmente in termini di trasferimento di conoscenze e sviluppo di capacità, supportando i processi decisionali a scala locale. Il paper fa riferimento a un caso studio ad Asmara, in Eritrea, dove l'erosione del suolo e le sfide legate alla scarsità d'acqua impongono strategie ed azioni a medio-lungo termine per favorire insieme la sicurezza idrica in ambito urbano e la riduzione della povertà nelle aree rurali.

Il contributo di Serena Massa, Nelly Cattaneo e Susanna Bortolotto, "*Past landscapes to shape future societies: research in the Horn of Africa",* presenta l'esperienza maturata dagli autori nel Corno d'Africa, nell'ambito del progetto archeologico eritreo-italiano avviato nel 2011 per la tutela e la gestione del sito dell'antica Adulis. Lo studio evidenzia come la tutela del patrimonio culturale e naturale sia strettamente legata allo studio e alla valorizzazione delle conoscenze tradizionali, al fine di contribuire allo sviluppo locale e promuovere la consapevolezza di una interdipendenza di fattori, che comprendono la scarsità di risorse idriche, l'impoverimento del suolo e lo sviluppo sostenibile.

Il contributo di Salvatore Viscuso, Anna Cantini e Alessandra Zanelli, "*Knowledge transfer into a system design process: the case study of S(p)eedkits – rapid deployable kits asseeds of self-recovery"*, presenta i risultati del progetto di ricerca S(P)EEDKITS, co-finanziato dall'Unione Europea nell'ambito del Programma Quadro FP7, che ha coinvolto - dal 2012 al 2016 - quindici partner europei tra organizzazioni umanitarie, centri di ricerca, accademia e aziende private, per lo sviluppo di Unità di Risposta all'Emergenza (ERU), soluzioni modulari e iper-leggere. L'articolo si concentra sulle modalità di trasferimento delle conoscenze lungo il processo di progettazione, secondo un approccio multidisciplinare e orizzontale.

INTERNATIONAL COOPERATION AND UNIVERSITY AGREEMENTS: NEW OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

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Sommario

Il processo di internazionalizzazione delle Università rappresenta un'opportunità di sviluppo per quanto concerne le tematiche ambientali e sociali. Questo articolo esplora un caso studio in cui gli accordi tra università di paesi a alto e medio-basso livello economico e lo scambio di studenti hanno permesso di iniziare un processo di cooperazione diretto per lo studio di problematiche ambientali. Gli accordi, firmati nel 2015 tra due università italiane e due boliviane, includono la cooperazione tra imprese private, governo locale e organizzazioni-non-governative. Questo processo di cooperazione prova l'importanza delle Università per l'implementazione di programmi di sviluppo in paesi a medio-basso livello economico, aprendo nuove opportunità per uno sviluppo sostenibile.

Abstract

Internationalization of higher education institutes is becoming a real opportunity of development in environmental and social subjects. This paper explores a case study where university agreements and student exchanges between low-middle income and high-income countries have started a process of international cooperation about environmental themes. The agreements, signed between two Italian and two Bolivian Universities, started formally in 2015 and include the cooperation through local authorities, private companies and non-governmental organizations. This case study proved the importance of Universities for implementing international programs concerning environmental issues in low-middle income countries, opening new opportunities for sustainable development.

Keywords: International Cooperation, university agreements, environmental management, sustainable development

Introduction

Globalization is becoming a reality always more emphasized by the phenomena of migration, exportation of goods, internationalization of industries and common environmental issues. International objectives developed by the United Nations about economic, social and environmental concerns led to the implementation of new international partnerships with the aim to introduce new plans for sustainable progress (Undp 2017). In this framework, the cooperation through low-middle income and high-income countries is becoming more popular and of interest in order to spread social equity and environmental sustainability. Indeed, International Cooperation between different communities, Governments and companies is the most important form for increasingthe number of new projectsin low-income countries, where the lack of economic sustainabilityand political will are barriers which cannot be overcome merely by local communities.

Usually, the international cooperation is introduced by collaborations through National Ministries or international Non-Governmental Organizations (NGO) which start new projects by the support of economic funds invested for specific topics such as sanitation, water supply, education and hygiene, among others. Such supports are underlined in the 17thobjective of the sustainable development goals (SDGs) with the scope to enhance global partnerships between Governments, civil society, the private sector, the United Nations and other actors, especially for improving the least developed countries (Undp 2017).

Nonetheless, one important role could be taken by the University. This institution is useful to start new agreements able to implement new programs for future project-development. Indeed, Universities are considered as strategic institutions in the processes of social inclusion and the enhancement of public awareness (Stefanini 2013)while the cooperation through international Universities has a key role in global markets since graduates most likely to deal with people from different cultural background (Chan 2004). The cooperation through scholars and the activities structured by University agreements, like students exchange and sensitivity campaigns, could be of utmost importance for improving the public awareness about ecological topics whereas the ability of higher-education institutions to contribute to international researches and sustainable-development-project can be a valuable strength point for future sustainable programs encouraged by the Governments (Koehn et al. 2011). The most relevant management issues could be represented by the lack of budgets, the different cultureand the unclear or unreliable exchange of information (López et al. 2011). Anyhow, such problems do not represent a real barrier for implementing new agreements which continuing to be a real benefit for higher education institutes.

The aim of this work is to introduce a case study where Universities play the most important role

for the implementation of new international agreements. In particular, the partnership between two Italian and two Bolivian Universities is reported in this study, highlighting main roles of the actors involved and the steps applied for introducing an integrated process for future development programs. The activity introduced by these academies' institutions allows implementing new alliances between NGOs, private companies and national stakeholders for developing integrated tools for enhancing the environmental sustainability of La Paz, a developing city inserted in a low-middle income country (Ferronato et al. 2016). The aim of the work is to underline the important activity introduced by the Universities into the international framework for the environmental protection and sustainable development. Students exchange, agreements signature, collaboration with the Bolivian authorities and with NGOs is reported as example of multi-stakeholder approach useful for mutual advantages.

The study area, the time required, and the actors involved

Bolivia is the country where the research took place, specifically in the city of La Paz. The city, at an average altitude of 3,600 m a.s.l., counts about 900,000 inhabitants and is subjected to worrisome environmental issues which, in a future perspective, will become dangerous for the life of local citizens. For instance, solid waste management, lack of land-use administration, river contamination and air pollution are issues which are not fully considered by the local policy. Moreover, lack of potable water during the dry season and the miss of clean water for agricultural use are topics which should be addressed for a sustainable development in future programs.

In this framework, University agreements were signed by two Italian Universities (University of Trento – Department of Civil, Environmental and Mechanical Engineering; University of Insubria - Department of Theoretical and Applied Science) and two Bolivian ones (Major Universities of S.Andrés – Department of chemical Engineering; Salesian University of La Paz), in order to develop environmental plans for anecologicalprogress.

Preliminary interactions took places in 2015, for implementing a thesis about environmental engineering. The subscription of the first agreements occurred in September 2015 by the University of Trento for allowing the first field work about solid waste management, developed from February to May 2016. Thanks to the good implementation of the study, a PhD study led to implementing future programs and introduced a second agreement (with University of Insubria) and the work of other two students about water treatment and supply. The schematic representation of the time required for introducing the process of internationalization is depicted in Figure 1.

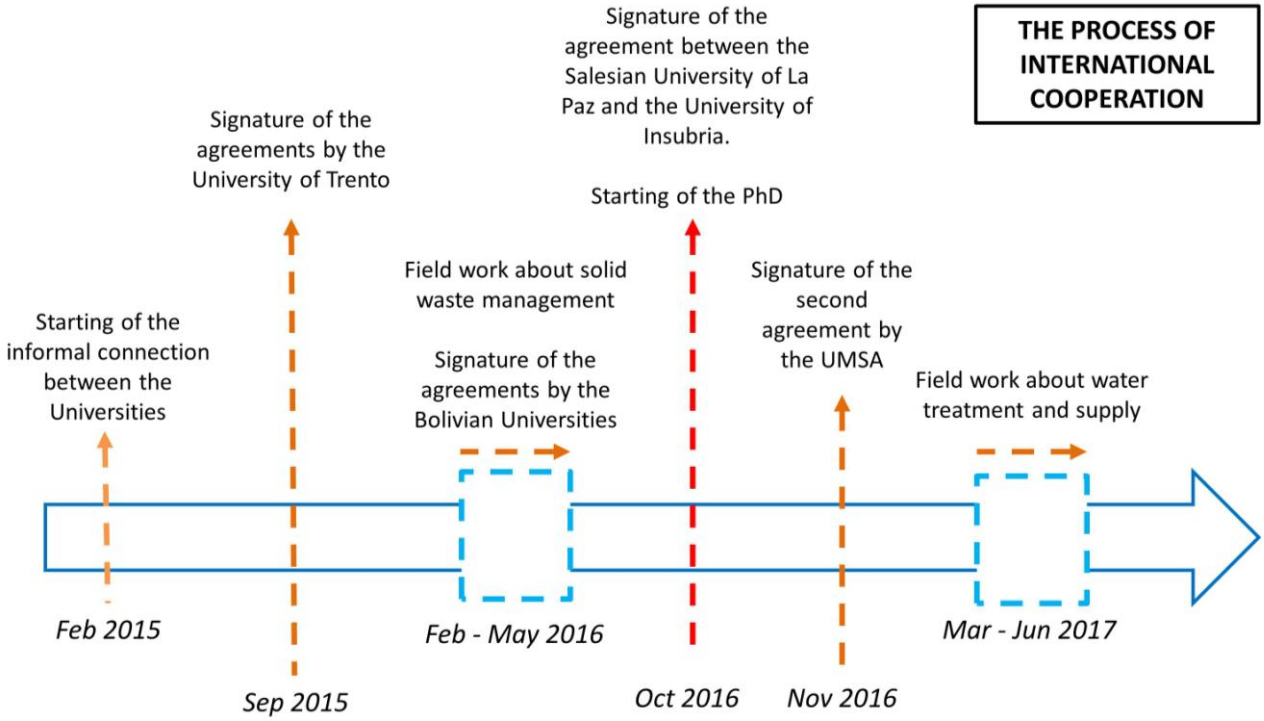

Figure 1 – Timeline of the starting process for developing the international cooperation between the Italian and Bolivian Universities

The local Universities of La Paz were interested in introducing new relations with European Higher Education Institutes, since, over the last years, NGO from Spain, Germany, Netherland, Italy and Switzerland, among others, were involved in local development activities about environmental topics, while the University of Trento was organized for implementing these kinds of agreements due to a dedicated master degree in environmental engineering for international cooperation. As a result, the international cooperation between scholars of European countries has been viewed as an opportunity for improving the network between the municipal authorities and the NGO which are operating within the country, and in the city of La Paz. So, NGO, local authorities and Universities started a strong connection thanks to the students who dedicated the whole period (three month) to a specific research. Moreover, the future inclusion of the private sector can be viewed as an opportunity in order to engage new form of investments able to create new jobs and enhance the environmental state.

The role of the universities and the researches involved

Differently with the usual objective of the international cooperation which is the implementation of projects about water treatment and management, the agreements between the Bolivian and Italian universities started thanks to the implementation of a thesis about solid waste management. The aim

of the work was the introduction of a circular economy approach useful for allowing new economic advantages by waste valorization. In particular, interviews to the local stakeholders, social surveys to the students of the universities, participation to the conferences and lessons about the topics and visits to the main solid waste management facilities were the main activities included in the study (Ferronato et al. 2016; Ferronato et al.2017). As a result, the inclusion of the university allows building a report about the current solid waste management practices of the city, providing suitable information for introducing a recycling company within the city and a management tool advantageous for planning future activities. The work has been developed thanks to the aid of an NGO, the local Municipal Government and a private Italian company (Ferronato et al. 2016). In particular, the Italian company provided the most important information for researching the needs for introducing a recycling activity into a new area without selective collection; the local NGO gave reliable previous studies about local issues and the activity of the informal sector; the local Government provided the information which were not accessible and confirm some hypothesis that were made. As a result, these dealings led to start an integrated and multi-stakeholder cooperation for the development of programs about municipal solid waste.

So, the commonly approach of international cooperation, which considered water supply as the most important subject to address, has been inverted: solid waste, like resource which should be valorized, became the most important topic into the agreements.Moreover,university has a central role in developing new researches, holding the contacts with the local government, private companies, NGOs, citizens and mass media (Figure 2).

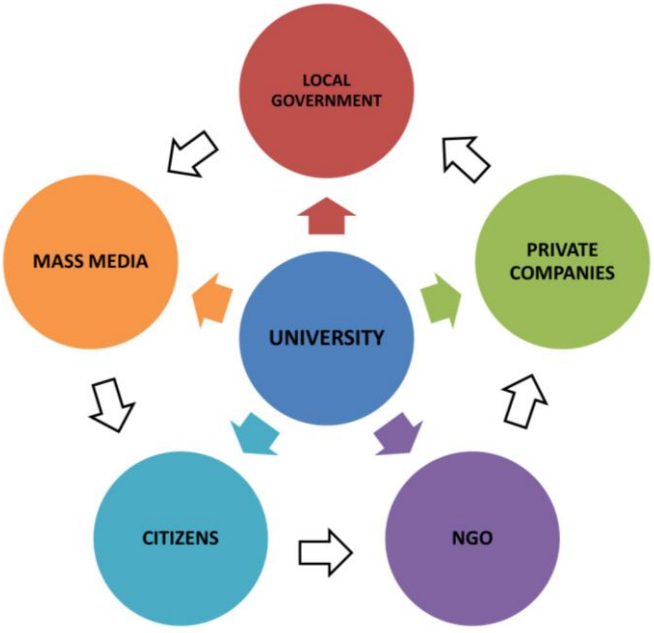

Figure2 - Actors involved into the international cooperation and main linkages between each other

As mentioned before, two othermaster degree thesis are implemented in 2017 for introducing new systems of water supply and wastewater treatment and supporting the local government and NGO. As applied in the first experience, other two students were involved in this international cooperation introduced, developing two different topics. The first project concerns the rain water harvesting, for answering to the lack of potable water during the dry season, while the second regards a project about wastewater treatment at household level. These works follow the same approach presented for the case introduced about solid waste management and according with Figure 2.

Future perspectives for improving the international agreements

The experiences introduced until now are encouraging for expecting future relevant results in environmental topics. The waste management program is going to be deepened by the enlargement of the team work and the inclusion of other private companies and NGO. In particular itis carried on by a PhD student, supervised by Bolivian and Italian professors, and will focused on the sustainable management of municipal and special solid waste, including the activity of the informal sector and thebehavior of local citizens. In this framework, private and public sectors, universities and NGOs are working in the same topics into an integrated management perspective and considering local issues, international requirements, social inclusion and future economic investments.

Other researches will be implemented mainly by Italian students of environmental engineering within their thesis work, including other subjects and environmental issues (i.e. air pollution, renewable energy, urban planning), as well as Bolivian students will support the activities too. Hence, in this context, thenetwork of universities' students is not viewed as a secondary actor, as stated by the classical vision of international cooperation, but is the most important form of bilateral relation which could develop new plans about environmental programs, useful for the local government and the city.Anyhow, attention needs to be paid to the cooperation process in order to maximize benefits and avoid failure (Spencer-Oatey 2012) since the relation between each stakeholder musthavean equal importance and each required specific attention.

Conclusions

International cooperationisaddressedby University strategies as a way for promoting internationalization and students exchange. In addition, the globalization and the sustainable development encouraged by international authorities transform these practices as an important tool for spreading awareness in environmental topics. Moreover, Universities can become a central actor for including other stakeholders into development processes.

The main objective of the international cooperation here presented is the implementation of applicable projects for improving the La Paz current environmental state. La Paz, as developing city inserted into a low-middle income country, can be consideredan example for introducing other researches in more Bolivian cities for globally enhancing the welfare of the Bolivian population.

A project about solid waste management has been introduced as first point for addressing future plans in environmental concerns, including other studies in water, sanitation, air and sustainable energy. Results are encouraging since Universities help in spreading new environmental programs, in alliance with other stakeholders like NGO, local municipalities and the private sector.

The study here introduced can be considered an example of international cooperation started by University agreements and improved by the inclusion of all the stakeholders, able to implement projects about environmental and social sustainability. The deals between these institutions can provide an answer to current issues about conservation of the resources, the use of different form of clean energy, the management of the land surrounding the city and the improvement of social equity. Hence, "within this multi-stakeholder approach, technology and know-how transfer become a collective building for a real and mutual learning".

Nomenclature

NGO	Non-Governmental Organization
SDGs	Sustainable Development Goals

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PAST LANDSCAPES TO SHAPE FUTURE SOCIETIES: RESEARCH IN THE HORN OF AFRICA

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Sommario

Il contributo presenta l'esperienza maturata nel Corno d'Africa nell'ambito del progetto archeologico eritreo-italiano avviato nel 2011 nel sito dell'antica Adulis. Uno degli obiettivi del progetto è la tutela e la gestione del sito con la creazione del Parco Naturale e Archeologico di Adulis. La tutela del patrimonio culturale e naturale è strettamente legata allo studio e alla valorizzazione delle conoscenze tradizionali, al fine non solo di contribuire allo sviluppo locale ma anche di promuovere la consapevolezza di una interdipendenza di fattori, con particolare attenzione alle sfide mondiali relative a scarsità di risorse idriche, impoverimento del suolo e sviluppo sostenibile.

Abstract

The paper presents the experience achieved in the Horn of Africa thanks to the joint Eritrean-Italian archaeological project in the ancient area of Adulis, started in 2011. A first objective is the protection and management of the site with the creation of the National Archaeological and Natural Park of Adulis. The preservation of the cultural and natural heritage is linked to the study and enhancement of the traditional technological heritage, in order not only to contribute tolocal development, but also to increase awareness about mutual interdependency with regard to the worldwide challenges of drought, soil depletion and sustainable development.

Keywords

Archaeology, intangible heritage, natural heritage, cultural heritage, preservation

Premises: the Eritrean-Italian Adulis Project

In 2011, the Eritrean Government and the Local Authorities of the Northern Red Sea Region, started a collaboration with the Research Centre on Eastern Desert (Cerdo) that resulted in the Eritrean-Italian Archaeological Project at Adulis. The main goal was to promote Eritrean Cultural Heritage, but also to boost the touristic attractiveness of the Country. This cooperative ties have been formalized and regulated through official agreements between the Eritrean Ministry of Culture and Sport and Cerdo.

The project aims at the rediscovery, study and valorisation of the archaeological remains of the town, *emporium* and harbor of the capital Axum (now in Ethiopia), also with the intent to create the first archaeological park in sub-Saharan Africa, for the touristic development of the region.

Principal goal of this project is to valorise the economic impact of the archaeological research in the domain of sustainability. To assess sustainability in past civilizations helps us to understand the limitations of present society and to look for alternatives, which may have great potential. The study of eco-systems, like the Eritrean Lowlands and the Dahlak Archipelago, where agriculture techniques used in ancient societies can offer solutions to actual problems and turn out to be more sustainable then modern ones, thus ensuring the preservation not only of Cultural Heritage but also biodiversity.

To understand contemporary problems, it is crucial to know how humans in the past related to and exploited the environment: sustainable development of past and modern societies are strictly linked. It is important to study how environmental risk was perceived and evaluated in the past and how ancient societies reacted to sudden and long-term changes, focusing also on adaptive strategies in the face of environmental challenges and variations in situations as mobility, migration, conflict and internal collapse.

The way we understand and value landscapes directly affects how we change them, this is just as true today as it was for people in the past.

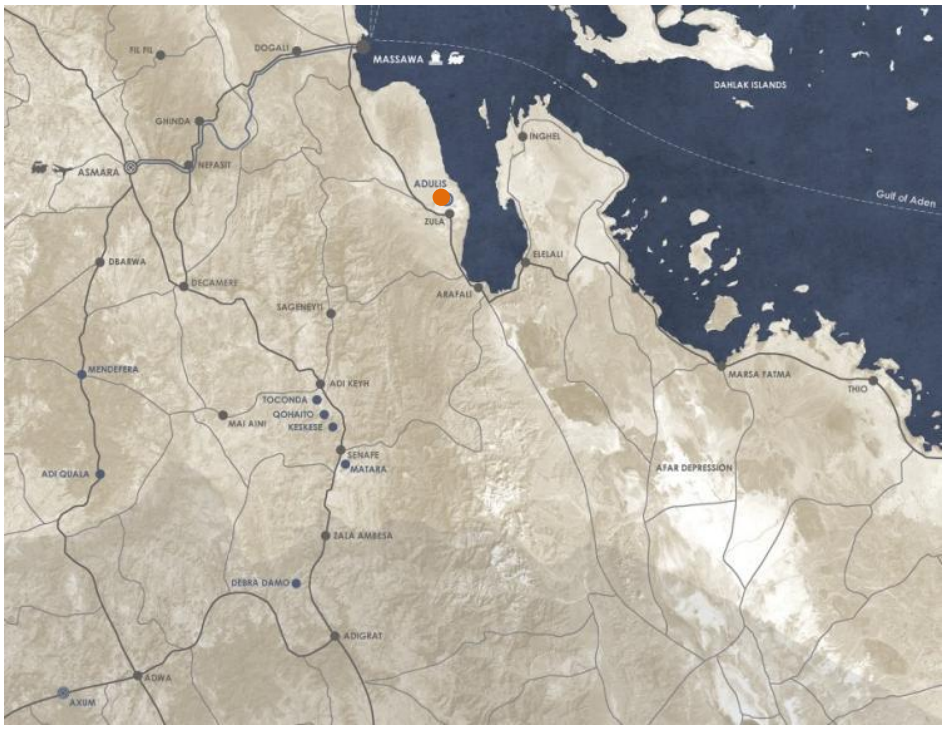

Figure 1 – Eritrean territorial setting.

'Landscape archaeology'and 'Public archaeology' should have something to contribute not only to understanding how people lived in past landscapes, but also to managing landscapes today and planning them for the future. Understanding the development of the cultural landscape is a crucial issue for academics and policy makers alike. Its importance goes far beyond this, however.

Cultural landscapes form the backdrop to all our lives and provide a key element in our sense of place and identity. It is essential that we understand them so that we can manage them effectively and develop them sustainably. By revealing the value in regional landscapes and the real nature of the similarities and differences between regions, this type of research can have important implications for ordinary people, planners and policy-makers from the local to the international level (Citter 2015).

Adulis Archaeological site: state of the art

The importance of the Red Sea in Antiquity is comparable to that of the 'Silk Route' or to that of the 'Amber Route', and its fate is intertwined with the 'African Route of Aromas' (De Romanis 2006) and the 'Route of Gold'. Legendary itineraries along which luxury goods, merchants, men and ideas travelled: one of the biggest commercial artery of the ancient world. And they had a nodal point in the present Eritrean territory, and in its most important port, Adulis.

Adulis commercial vocation was probably already active in the Pharaonic era (Ancient Kingdom, 2650-2150BC), in the context of the traffic in precious materials not found in Egypt and sought in the fabulous *Land of Punt*. The location of Adulis can be included in the area of the Land of Punt, identified in the regions bordering the southern Red Sea. Archaeological levels dating to the latter half of the second millennium-early first millennium BC were documented by the excavations: Adulis in this period is part of the Afro-Arabian cultural complex, which extends from southern Arabian regions to the Eritrean plateau.

From the size of village and *oppidum* reported by the sources (*Periplus Maris Erythraei*; Pliny the Elder) in the second half of the first century AD, an increasing development and importance of the site until the Byzantine period is concomitant with the rise of the Aksumite kingdom, of which Adulis represented the gate to the sea (Casson 1989).

The destruction and abandonment of Adulis between the seventh and eighth centuries AD, probably due to natural catastrophic events more or less concurrent with the Arabic conquest led to the isolation of the kingdom from the access to the sea, while the Islamic communities who settled along the coast took over the role of Aksum in the control of the trade between the Mediterranean and the Indian Ocean (Fattovich 2014; Bowersock 2013).

The Research in 19th and 20th centuries

The name of Adulis in the modern era is reported in the cartography from the sixteenth century.The rediscovery of the ancient town ruins is described in the reports of travellers, scientists, and military who, since the early nineteenth century, visited the region for different purposes.

The first survey of the site dates to 1840; in 1868 the first excavations, conducted by the British army after an initiative of the British Museum, led to the discovery of a large church at the south eastern end of the town.In 1906 the Swede Richard Sundström performed limited investigations northwest of the British excavation, bringing to light a building that he identified as 'palace' (Salt, 1814;Sundström 1907; Munro-Hay 1989).

A more extensive excavation campaign was carried out by Roberto Paribeni in the same year, 1906, the results of which are still fundamental for the reconstruction of the topography of the site and its chronological phases, from prehistory to the seventh century AD (Paribeni 1907).

In 1961-62 new archaeological research was carried out at Adulis by the Institut Ethiopien d'Archéologie directed by Francis Anfray(Anfray 1974). Trenches were opened in the western sector of the town, revealing rooms pertinent to different chronological phases, still visible today.

In 2004-2005 the survey project conducted by the University of Southampton led to the identification of the port of the town in Aksumite times, in relation to the locality of Gabaza, and of a more ancient harbour at the island of Diodorus, near the Galala Hills, asknown by the literary sources.

The new Research Project

At the time of launch of the Eritrean-Italian cooperation project in 2011, the site appeared almost completely buried by the sand and bushes, a landscape not dissimilar from the one described by the first explorers of the nineteenth and twentieth centuries (Bortolotto *et al*. 2013, Castiglioni *et al*. 2013).

The new research, started in 2011 and still ongoing, has been concentrated in some sectors of the town, which is estimated to be about 40 hectares. The sectors have been chosen to return to the site the major monuments already known from previous research, beginning with the complex excavated by Paribeni in 1906 in the northern sector and referred to as 'Altar of the Sun' (sector 2). Four other areas were also investigated, two at the south western limit of the town and along the river Haddas, sector 1 and sector 5, another close to the place where the British Museum excavated

a monumental church in 1868, currently buried, called sector 3, and an area located at the eastern limit of the city, referred to as sector 4[1].

Figure 2 - Adulis camp, 2011.

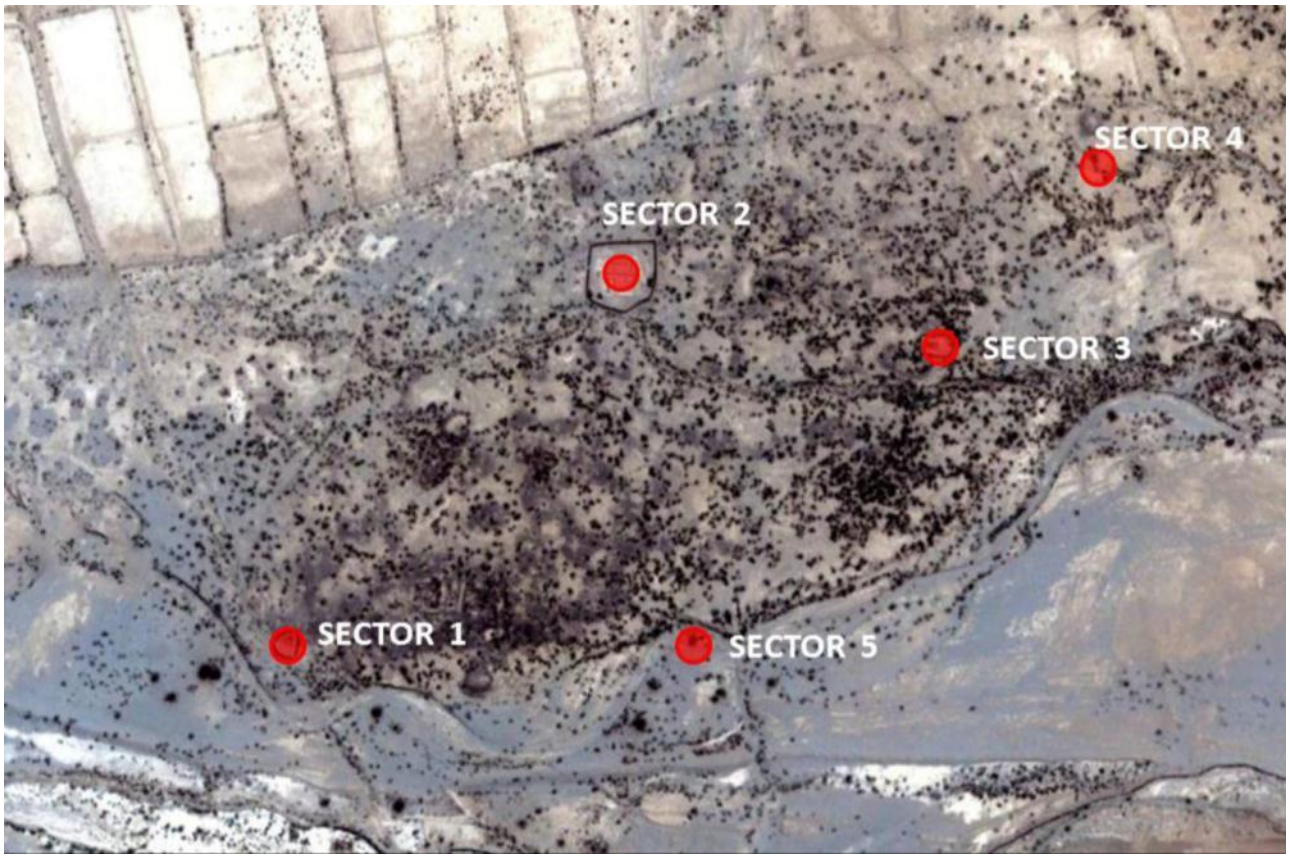

Figure 3 - Adulis 2011-2017, the excavation sectors.

[1]Annual Official Reports, 2011, 2012, 2013, 2014, 2015, 2017.

The most interesting result of excavations in sector 1 was the finding of an ancient phase of occupation at the site dating to the 1st- 2nd century AD. This occupation level was characterised by a concentration of pottery, bones, lithics and stone tools that can be referred to a domestic use of the area; associated with it, is the remains of a massive wall. Imported materials from this earlier phase include Nabatean fine ware and Egyptian amphorae, beside some almost complete pots and beakers with thin walls and incised and painted geometric decoration, probably imported from the highlands or similar to the highland production.

The most important monument of the site, so far, is located in sector 2. It is a building with basilical plan divided into three naves, east-west oriented, standing on a high base of truncated pyramidal shape. Its dimensions are 18,80 x 10 m. The monumental basement is constructed of basalt blocks carefully squared, alternating to courses of schist slabs and bound with clay. The perimeter contains projections and recesses and is elevated with offsets at regular intervals, in the typical mode of the Aksumite monumental architecture. It is the expression of an original architectural style, in which the Mediterranean model of the Christian basilica meet the local tradition.

The important, new information coming from the stratigraphic excavations is the chronology of the monument, dating to the second half of the fourth century: this new excavation data at Adulis provide for the first time a chronological reference for the early Christianization of Sub-Saharan Africa. This finding constitutes a valuable confirmation of the testimony of the textual sources about the early Christianization of the Aksumite kingdom, which is counted among the most ancientcivilisations of the Christian world.Impressive is the liturgical furnishing of the building, carved in marble coming from the Byzantine Mediterranean and probably donation by the Court of Byzantium or commissioned by local aristocracy. The marble furnishings of the Adulis church has so far no parallel within Ethiopia's ancient Christian architecture. This evidence lies chronologically in the background of the historical and political context that, in the sixth century, involved the port town in international events around 525 AD at Adulis was gathered the allied fleet of the Byzantine and Aksumite empires, led by Kaleb, the Aksumite kings of Aksum Kaleb, to move to the other side of the Red Sea, in South Arabian territory, against Yusuf, the King of Himyar, supported by the Persian Empire.Archaeological investigations in sector 3 revealed a series of rooms near the monument excavated in 1868 by the British Museum. The walls and their collapses provide almost intact evidence of the abandonment of the town; the finds included imported amphoras and Glazed Ware, local pottery fragments - some forming almost complete pots - many *Cypraea moneta* specie of shells - some of which burnt - few fish and animal bones, fragments of glass vessels and ostrich eggs, one blue beads bracelet. The most outstanding find from room ‘C’ consisted in an

anthropomorphic ceramic figurine showing oriental features ascribable to the Indian 'Gupta' art of the 4th-6th century AD.Architectural features and quality of the material culture evidence the high level of this building, probably an aristocratic residence for an important personage.

Sector 4involves a second very important building, a monumental church located at the eastern extremities of the town, oriented east-west and standing on an imposing basement. Its dimensions are 26 x 18 m, to which may be added the churchyard that stood in front. The church as a whole is rectangular in shape, but the main chamber is square and the central area bordered by eight pillars arranged in a circle; to the east, two rectangular rooms flank the apse. The room south of the apse contains the baptismal font: the tank is circular, two steps to the east and two to the west facilitated the immersion. A big staircase functional to the ascent to the church wasin front of the façade. Such centrally-planned churches with an ambulatory are rare not only in the kingdom of Aksum, but also in Nubia and Egypt.The date is estimated to the fifth - sixth centuries.

Sector 5 was opened in the southern limit of the town, on the edge of the river Haddas. Excavations in this area revealed the presence of an intense and continue building sequence in a period comprised between the 5th and early 7th century AD. The rooms investigated during this field season revealed the presence of a possible workshop area for the manufacture of the mother of pearl, ostrich shells and red coral, a food processing area with the evidence of three ovens similar to the contemporary *tannur*, still in use by the people inhabiting the Eritrean and South-Arabian coasts, and a domestic area characterised by fireplaces and by fragments of cooking pots and jars. It is worth to note the finding of a gold coin (Manzo 2014).

Environment and Landscape

The flourishing of Adulis, related to the trade of luxury items as well as of foodstuffs, had to be based also on a close connection with the surrounding area, supplying water and fresh food to its inhabitants also during the months of inactivity of the harbor. It was not by chance that the plain where Adulis rose is advantaged by the presence of seasonal floods: at its west the first mountains of the highlands raise, and the axumite site is nowadays not far from the place where Haddas, Alighede and Komailo rivers join their waters, collected during summer and winter rains. Seasonal rivers promoted the constructions of barriers and dams in order to collect the surplus of water, providing it during the dry season, and to control its violent flow.

Today one of the main dams of Eritrea, built in 1958-60, is in Foro, three kilometers upstream the archaeological site of Adulis, in a place where natural basaltic terrace provided a good anchorage of the barrier. In a few days during summer rains the water collected by the dam is directed in a fan of

canals down into the fields, using soil barriers and embankments. This technique is called ‘spate irrigation’: the fields are flooded and the embankments are meant to retain water long enough. It is an ancient technique, already in use in Yemen several centuries BC; from there, according to some scholars, it was introduced in Eritrea at the beginning of the 20th century, when many workers coming from Yemen were employed in the wide agricultural compounds promoted by colonial land tenure policies, but it might have been in use already at the time when the other side of the Red Sea was part of the Axumite kingdom.

The water flushing down from the mountains carries big amounts of soil, silt and stones, and as they deposit in the plain the ground level increases and the coastline moves towards the sea.

Figure 4 - Adulis archaeological site, the irrigation system and the cultivated areas.

Figure 5 - Embankments of the fields between Adulis and Afta

According to Peacock and Blue's archaeological investigations (2004-2005), the current coastline, compared to the ancient one, has an offset towards east of approximately 1 kilometer (Peacock, Blue 2007).

By an Abyssinian legend, Adulis was destroyed by a flood caused by an earthquake and the sudden total drain of a little lake upstream: the event was so violent that the sound could be heard in Axum. Beside seismic occurrences, the violence of Haddas river is still well known, and the good maintenance of Foro dam, as well as the important water management system carried out by the local community of farmers from Foro, Zula and Afta, are the main safeguard measures of the archaeological site of Adulis: the traditional way of farming in Foro and downstream is of paramount importance for the protection of the site. To maintain this water system efficient, a huge and permanent man-powered work is necessary, and this fact created very strong community ties. It is usual in Foro, Afta and Zula villages to work together for the community benefit. These strong ties can be clearly noticed also during the archaeological excavation activities.So Community is the first and main partner in the protection of the site. And community should be the first to benefit from it. The enhancement of the visibility of the site and the idea of making it more accessible to tourists thanks to the creation of an archaeological park, must be planned very carefully together with the local community.The main risk is that a narrow group of stakeholders may exploit in the future the touristic attractions of the area; this would create a not equal economy and at the same time would alienate the heritage from the community.The challenge of the next years will be to develop together actions able to raise awareness of the community in their capabilities to manage the manifold aspect related to their heritage.

Fig. 6 - The dam of Foro and the natural basalt wall

Adulis Archaeological Site: strategies for the future of Eritrean Heritage

As already stated in the premise, sustainable development of past and modern societies are strictly linked. In recent decades, researchers have focused on sustainability by searching for new techniques and new methods through a holistic approach. Environment's capacity to sustain human communities, exploitation of natural resources, changing settlement patterns and human adaptive strategies are key themes, also linked with the topic of resilience.

Resilience, in relation to external changes, especially environmental ones, requires technical knowledge derived from a historical memory rooted locally and able to develop new adaptive landscapes.

Studying sustainability with a single source approach is insufficient. To understand environmental sustainability means to understand the complex relationship between the natural environment and the human communities in the long term.

A historic landscape may be defined as the context in which people realise the material needs of subsistence, social coexistence and psychological self-esteem.

Infrastructures determine the degree of inter-connection between different areas of a territory, local, regional and national. In other words, infrastructures define nodality.

In order to survive, an independent settlement must integrate different resources, including agricultural and uncultivated land, the potential for craft production and exchange.

The durability of an economic system depends on the organisation of settlement and economy and its social cohesion, which in turn is based on religion and on a common identity: in Eritrea the Christian and Islamic communities live peacefully in harmony.

From a theoretical perspective, the study of an historic landscape must be diachronic, complex and relational. A relational approach is crucial because all elements that create landscape are interconnected in different circuit of integration at local, regional or larger scales and with many relationships: economic, social, ideological. The study of historic landscape implies connectivity between the various elements that compose it: settlements, production sites and ideological and cultural places, within which there is a whole world linked to the supernatural and to the identity and collective memory of a community.

Every human activity is part of a sequence and archaeology is distinguished by the principles and standardizes methods that it uses to identify relative events. The modern archaeology operates under the principles of stratigraphy.

In this holistic perspective, the approach is multi and inter-disciplinary, without the presumption of an impossible global knowledge (Brogiolo 2015).

The Adulis project can demonstrate the high economic potential of Public Archaeology, and the effective role of culture in creating better life conditions.

Fig. 7 - Dinner at Adulis Camp.

Within the methodological framework stated above, specifically for the site of Adulis the strategies for the future should take into account the solution to the following problems:the training support and formation, required for the protection and management of the Eritrean Cultural and Natural Heritage, with the application of standard qualified procedures about research, conservation and preservation. This knowledge is needed for their valorisation as assets for the economic growth of the territory, compensating for the shortage of professionals capable of handling such pivotal resources. In this direction had been signed an Agreement between Politecnico di Milano and Eritrean Institute of Technology (E.I.T.), Mai Nefhi (2016). Therefore, a presence of the University teachers and experts can be assured for education and training courses (also for tourist guide) and the preparation of related materials (books, guidelines, scientific tools, etc). Essential is further the realization of the buildings and facilities of the Adulis ArchaeologicalPark, starting with a house, laboratory, store room for the preservation work; most important will be the building of the visitors' centre. To connect the site of Adulis to its territorial context should be necessary to link the archaeological itineraries with the rural/cultural landscape and villages. In a broader view,to create a system that can enhance the understanding and valorisation not only of the archaeological evidences, but also of its setting in relation to the environment and resources exploitation since

Antiquity, could be planned the net of the natural parks (Buri peninsula and Semenawi Sahri), and other places near Adulis as: salt flats, Galala Hills, basalt quarries, Foro dam, Zula Bay. This will also increase the time that tourists can spend in the territory and the economic activities of the local people.At the larger scale the connection of Adulis with the other Aksumite archaeological sites on the route to the Highlands (Qohaito, Matara, Kaskase, Tokhonda) will be profitable. Lastly, during the Unesco Council held in Nairobi in January 2017, the application of Adulis and the Highlands sites has been proposed for a future tentative list of inscription as serial sites in the World Heritage List[2].

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Nomenclature

Cerdo	Centro Ricerche sul Deserto Orientale
Eit	EritreanInstitute of Technology

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PARTICIPATORY ASSESSMENT OF SUSTAINABILITY IN SMALLHOLDING AGRICULTURE: THE AGROECOLOGICAL CASE IN CENTRAL AMERICA

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Sommario

Nell'ambito del progetto Uni.Coo, è stato realizzato un progetto di ricerca in partenariato tra l'Università di Torino e l'Ong Re.Te. Con il fine di valutare la sostenibilità dei sistemi agroecologici di piccola scala in America centrale è stato promosso un processo partecipativo coinvolgendo tutti gli stakeholder più rilevanti. Il processo partecipativo mirava innanzitutto a sviluppare una definizione condivisa di sostenibilità, e in secondo luogo a definire uno strumento per la valutazione della sostenibilità dei sistemi agroecologici basato su indicatori e facilmente fruibile. Questo articolo descrive ed analizza le diverse fasi del processo partecipativo fornendo suggerimenti per ulteriori attività di ricerca nell'ambito degli strumenti di valutazione partecipata della sostenibilità per l'agricoltura su piccola scala.

Abstract

Within the Uni.Coo project, a partnership research project between the Turin University and the Italian Ngo Re.Te has been developed. A participatory process has been carried out to assess the sustainability of agroecological small-scale agricultural systems in Central America considering all relevant stakeholders. A participatory process was initialized firstly to develop a shared definition of sustainability and secondly to design a user-friendly and indicators-based framework for the assessment of the sustainability of agroecological farming systems. This paper aims to describe and analyze the steps of the participatory process giving insights for further research in the field of sustainability participatory assessment tools for small-scale farming.

Keywords

Uni.Coo, sustainability, agroecology, small-scale farming, Hesofi

Introduction

The Uni.Coo project (UniTo for International Cooperation) is a university student mobility programme on international and development cooperation with African, Latin American and Asian countries, which aims to promote scientific and academic cooperation in developing countries. Within the Uni.Coo framework in 2015 a partnership research project between the Turin University and the Italian Ngo Re.Te has been initialized. Hence, a participatory process has been carried out to assess the sustainability of the agroecological small-scale agricultural systems in Central America. The aim of this research project was to merge scientific and empirical perspectives on agroecology into a tool, which would empower agroecological movements of Nicaragua, Honduras and El Salvador in their influence on political institutions and policy-makers by producing scientific data based on farmer's sustainability self-assessment. During six months of field research three scholars of Turin University, the Ngo Re.Te, academics, members of farmers' movements and local farmers worked together in order to develop a practical tool for the multidimensional assessment of sustainability in smallholding agriculture. This instrument has been characterized by a participative approach and validated by several scientific institutions. Indeed, Universities of Italy, Nicaragua, Honduras and El Salvador jointly sustained the research process collaborating with several stakeholders linked to small farming and agroecology in Central America. This process led to both empirical and theoretical results. The Uni.Coo project's experience in Central America was an interesting example of multi-stakeholder process, which could be used as basis to further develop similar research experiences in the field of smallholding agriculture and sustainability.

The objective of this paper is to show the development of the participatory process, highlighting the steps that allowed a significant participation and the production of a scientific sustainability assessment tool. Several stakeholders have been directly involved in Nicaragua, Honduras and El Salvador, such as Universities, Ngo, Institutions, National farmer organizations and farmers. The experience gained through this process comes from already existing networks and experiences, that arose thirty years ago in the Mesoamerican region, and this paper wants to continue to trace the same path in order to stimulate similar activities in the future. This paper thus first briefly analyzes the situation of small farming and agroecology in Latin America, then it describes the local farming context and finally the principal steps and results of the participatory process are showed. The authors wish that this experience would support research in this field in order to improve small farming conditions and boost the scaling up of sustainable practices in agriculture through agroecology.

1. SMALLHOLDING AGRICULTURE AND AGROECOLOGY IN NICARAGUA, HONDURAS AND EL SALVADOR

Since the Earth Summit held in Rio de Janeiro 1992 small scale agriculture has been recognized to be a key factor for food production and environment management, considering the farmer based approach crucial in international agendas in order to gain sustainability in world food production (Rio Declaration, 1992). Small farmers represent the majority of the agricultural productive units in the world, but the vast majority of them cope with low resources availability and rural poverty (Fao, 2015a, Altieri, 2009).

There is still not a universally accepted meaning of small farming, so for the aim of this paper we need to refer at smallholding agriculture considering it in the Central American context, naming a small farm an agricultural unit which is managed by family members who represent most of the farm workforce, with small productive areas and characterized by low income, few means of production and limited financial access.

The definition of agroecology was born in the ‘30s of the twentieth century principally linked to agronomic studies, its meaning evolved during time as the scientific community accepted it as a bulk of multidisciplinary knowledge and practices to get sustainability in agriculture, not just in a productive and agronomic point of view, but also considering its social, economic and environmental dimension, finally defining it as a Science, a practice and a movement (Wezel et al., 2009). Agroecology can be interpreted as the application of ecological principles to the study, design and management of sustainable agroecosystems with the aim of stabilize them, increasing their resilience and resistance, reducing needs of external inputs through the creation of benefic biological synergies in the farm system (Gliessman, 1990). Agroecological practices are peculiar to each local ecosystem and adapted to environmental and socio-economic local conditions, all of them share the aim of increasing soil regeneration, biodiversity, optimization of the use of local natural resources and diversification through low capital intensive instruments based on local traditional and scientific knowledge (Altieri and Nicholls, 2005).

In Latin America agroecology has consistently widespread over the last 30 years with important positive results obtained by means of a wide participation of various and different actors such as farmers movements, grass roots movements, Ngo and Universities. Farmers had an active and important role in the extension of agroecology in Latin America through the peasant process of technological and technical innovation “Campesino a Campesino” (CAC), farmer to farmer in English, which had taken place for the first time in Mesoamerica more than 30 years ago (Altieri e Toledo, 2011). CAC is a bottom-up process of generating capabilities based on a horizontal

transmission of knowledge through farmer to farmer knowledge sharing method of information diffusion starting from community to national scale level (Rosset et al., 2011). Various Latin American countries have experienced positive scaling up of agroecological practices use at national level through this participative and multi stakeholder approach (Holt-Gimènez, 2008).

The new scenarios of participatory approaches in rural development and agricultural research emphasize the comparative advantages of farmers and scientists in generating knowledge and propose innovative ways to combine local and global science (Neef A., Neubert D., 2011). Within the approaches that combine various forms of stakeholder participation with scientific research, our contribution aims to bring some innovation in the creation of self-assessment tools that could impact on policy-making.

Nicaragua, Honduras and El Salvador are characterized by the lowest human development indices in Latin America, large segments of the population are suffering of chronic malnutrition and high poverty rates, especially in rural areas (Fao, 2015b). Since the sixties the policies adopted for the development of the agricultural sector have been based on Green Revolution's precepts encouraging monoculture plantations of commodities for exporting markets with the use of high impact practices of input-intensive agriculture, characterized by exploitation of resources, unsuitable land use, deforestation, erosion, low returns for hectares and economic dependence. In poor rural areas, the producers operate with simplified production systems that do not allow an improvement in living conditions, with little diversification of production which sometimes do not guarantee neither the basic food needs of the family. Hence, on one side there is industrialized agriculture, which is characterized by a large use of external inputs and high outputs mainly destined for export. On the other side, there is a weak, economically and technologically, agricultural network: smallholding agriculture. Despite its weaknesses, smallholding agriculture in Central America brings together the largest number of agricultural production units compared to industrialized agriculture (Rodríguez et al., 2013).

From an historical point of view, both Nicaragua and El Salvador in the '80s experienced socio-political changes, namely the Nicaraguan and Salvadoran Civil War, which consisted in violent conflicts between the military-led governments and left-wing guerrilla groups. Especially in El Salvador indigenous minorities in rural areas were persecuted, and in both countries the armed conflict led to the creation of strong networks between peasants, which permitted to maintain ancestral traditions and cultural identity. These rural networks, developed during the civil war, last still today in form of widespread cooperativism. The solidarity of producers within associations and cooperatives today is also a form of defense to face the difficulties that have arisen since the development of the phenomena of the *Maras*, criminal gangs of youngsters which has led to a

decrement of security and an increase in violence and criminalization of the society, especially in El Salvador and Honduras. Finally, these networks of farmers and cooperatives that originated within this strong associative system can also reduce the vulnerability of rural areas, support families and smallholding farms to face climate change and preserve the ecosystem (Agrawal, 2010).

The research was inserted in a wide multi-country international cooperation project that started in 2012 and was called "*Strengthening the advocacy capabilities in public policies on Food and Nutrition Security of three organizations of small producers that promote agroecological and organic production*"[I]. The project is managed in partnership between the Italian Ngo Re.Te. and the Nicaraguan Unión Nacional de Agricultores y Ganaderos (Unag) and it has been financially sustained by the International and Cooperation program of the European Commission.

The aims of the project focus on the promotion of the participation of small agroecological producers of Nicaragua, Honduras and El Salvador in the institutional spaces in which are defined and applied policies for food security. Actions have been realized in order to strengthen the competences of peasant grassroots organizations in developing and implementing food policies based on organic agriculture and agroecology at national levels. Various peasants' movements have been boosting ecological practices at local levels in the three countries for more than twenty years, but with scarce results in terms of scaling up at institutional confrontation for policy suggestions.

The project's activities included dissemination and scientific validation of the agroecological models, which will allow producer organizations to defend their rights and to participate in the political debate on agriculture policies at national level, as well as improvement of the strategic coordination. The project promoted social network creation among national and international stakeholders such as Universities, grassroots associations, consumers, Ngo and farmers' movements for their advocacy in the process of consultation, drafting of laws, policies and setting of programs focusing on environmental sustainability, product diversification and fair trade. Main beneficiaries of the project were different farmers' organizations, bringing together 19,700 agroecological and organic producers, involving university in the three Central American countries and in Italy. Within this context, a multidisciplinary team of young researchers supported a participatory process for the creation of a tool for self-assessment of sustainability for Central American agroecological smallholding farming.

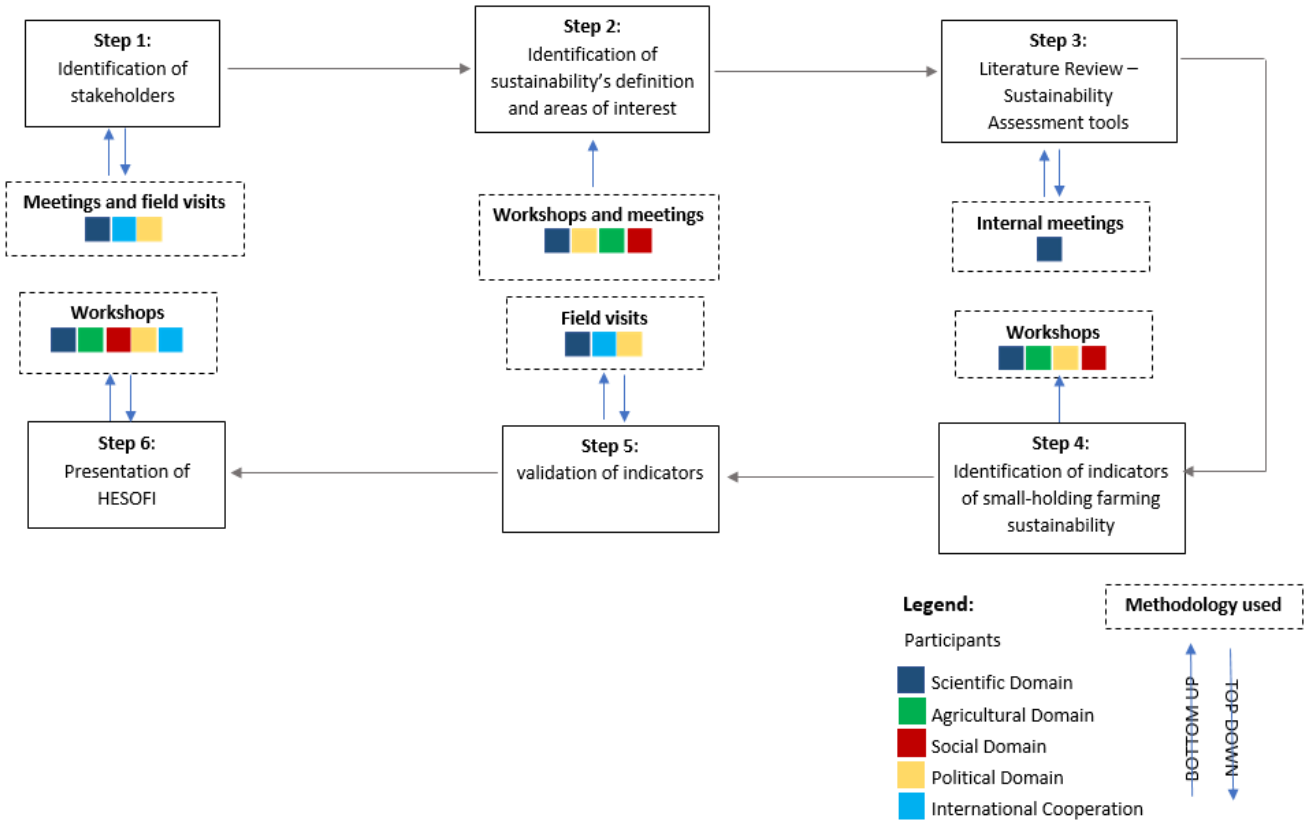
[I] The original name in spanish is: "*Fortalecimiento de las capacidades de incidencia en políticas públicas en SAN de tres organizaciones de pequeños productores que promueven la producción agroecológica y orgánica*".

2. THE PARTICIPATORY PROCESS

Agricultural sustainability can be interpreted within a multidimensional approach considering all the factors that agriculture influences such as the social, economic and environmental dimension. Therefore, during the research project a participatory process was initialized aiming to develop firstly a participatory definition of sustainability and secondly a user-friendly and indicators-based framework for the assessment of the sustainability of agroecological farming systems. Once the main areas of small-scale holding in Central America had been identified, for the purpose of conducting a participatory process to create a sustainability self-assessment methodology different types of stakeholders representing the world of research, small-scale agriculture and rural communities, and organizations of rural development on a territorial and regional scale have been involved (Wezel et al., 2009). Incorporating in the process of decision-making the multiplicity of stakeholders it is possible to create a tool that considers the various needs and can represent them jointly. During the process several stakeholders were gathered together in Nicaragua, Honduras and El Salvador. Similarly, both bottom-up and top-down approaches were combined in the different stages of this participatory process. As recent literature points out (Chamaret et al., 2007, O'Ryan et al. 2015), these approaches are combined to answer many of the needs for information and management tools of stakeholders (bottom-up) and also to enhance the legitimacy of such tools (top-down).

Figure 1 shows the steps of the participatory process that led to the development of a shared methodology to assess sustainability of small-holding farms in Central America. The diagram shows the activities of each step, highlighting the participants who have been involved, the approaches and methodologies that have been used. Each step is discussed in the following chapters presenting the main issues and methodological concerns required to obtain a sustainability self-assessment tool.

Figure 1. Steps of the participatory process. *Source*: the authors



3.1 Identification of stakeholders

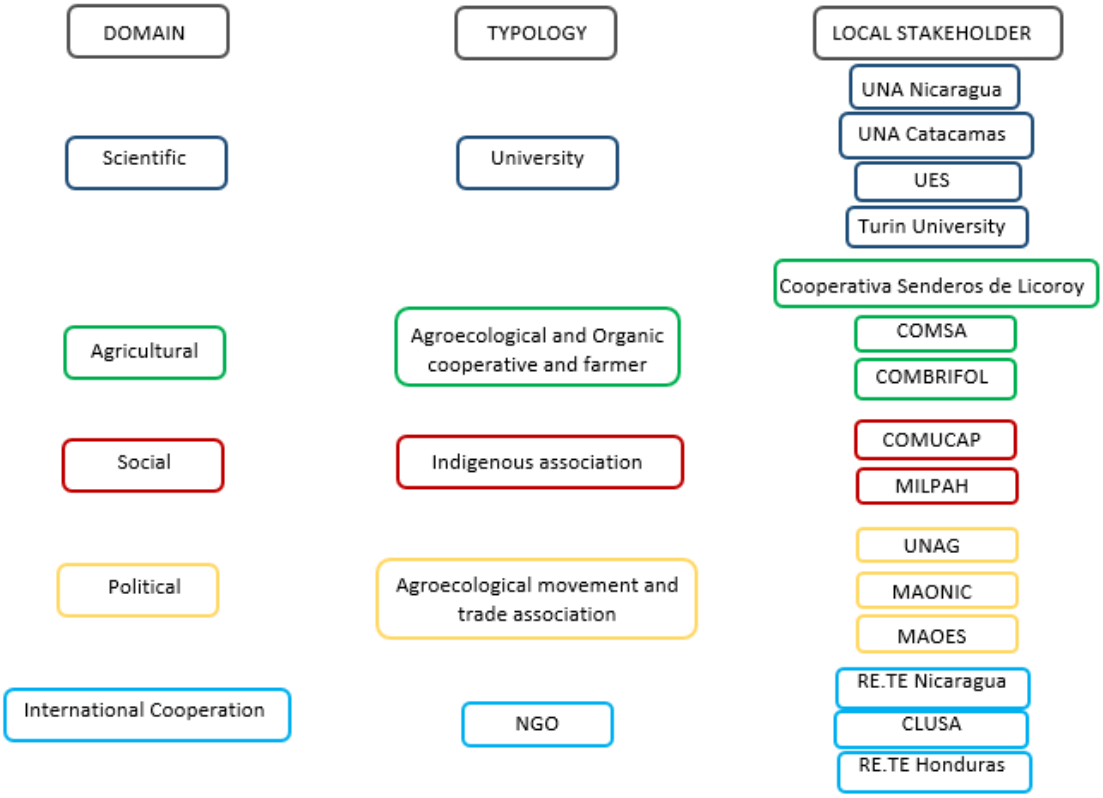
The first step was identifying all the stakeholders who would represent the complex agricultural, socio-cultural and political context. For each of the three countries, approximately a participant for each domain was selected. Priority was given to those who had already participated in past activities of evaluation of agricultural systems or in research about agroecology, who had agricultural and agroecological expertise, who had experience in dialogue with public and private institutions in policy making and in managing of rural development projects on a territorial scale, and finally who represented rural communities. Local key stakeholders have been involved through meetings and field visits to identify decision-makers' expectations (Carof et al., 2013) and needs: university professors representing the regional academic landscape; agroecological and biological farmers representing small-scale agriculture; cultural associations representing indigenous minorities and knowledge; agroecological movements and cooperatives representing the governance of territorial processes.

In their definition of agroecology, Wezel et al. (2009) highlight these domains: scientific, agricultural, social and political. As shown in Figure 2 each domain was represented by different stakeholders from Nicaragua, El Salvador and Honduras. Firstly, the scientific domain was

embodied by several universities. Secondly, the agricultural domain was represented by agricultural and organic cooperatives, which gather together agroecological and organic farmers. Thirdly, indigenous associations stand for the social domain. Moreover, the political domain was embodied by agroecological movements and trade associations.

The participatory process involved a final additional domain, not included in Wezel et al. (2009)'s definition: international cooperation, represented by local Ngo.

Figure 2. Stakeholders involved into the participatory process. *Source*: the authors



3.2 Identification of a definition of sustainability and areas of interest

After finding out the stakeholders, their main needs were collected in a participatory process through a series of workshops and meetings. The approach used in this phase was bottom-up, which permitted to capture stakeholder's concerns about sustainability. These would then be covered by the strategic areas of the new sustainability self-assessment tool.

Through this approach during the first meetings a shared vision of sustainability was identified by clustering the critical issues of farm sustainability highlighted by stakeholders in three sustainable dimensions (Figure 3). Moreover, the workshops and meetings allowed to gather their expectations about a participative tool for sustainability assessment associating these expectations with different

areas of interest (Figure 4).

Figure 3. Vision of small-scale farming sustainability. *Source*: the authors

Issues of Sustainable Farm		
Socio-political dimension	***Economic dimension***	***Environmental dimension***
· Life quality	· Business Planning	· Seeds
· Healthy nutrition	· Self-sufficiency	· Water Basin
· Education	· Product Diversification	· Soil
· Gender Equity		· Water
· Relationship with Public Institutions		· Ecosystem Protection
· Farmer and Family Awareness		

Figure 4. Areas of interest for local stakeholders. *Source*: the authors

Six different Strategic Areas emerged:	
1.	To represent cultural identity
2.	To allow comparison with other types of agricultural management
3.	To facilitate dialogue with institutions and universities
4.	To facilitate understanding by farmers
5.	To represent the production unit
6.	To analyze critically the agricultural system

3.3 Literature Review

The suggestions arisen and collected during the workshops were later complemented with information from a literature review, which was carried out mainly during internal meetings. The literature review included scientific articles about assessment methods of agricultural systems sustainability, specifically *Saemeth*[II] by Peano et al. (2015), a scientific tool of 52 indicators with the aim to assess the sustainability of a small-scale agri-food system; *Cmb*[III] by Vázquez Moreno (2013), that allows to define the level of complexity of the production system; *Mesmis*[IV] by Astier et al. (2011), an important and widespread study that uses a participatory methodology for assessing sustainability. Moreover, technical documents were analyzed, such as the *Manual Tecnico Agroecologico* (Mta) provided by Maonic (2014), a methodological framework created by farmers with the aim of gathering the information needed to plan a development program to improve the management of the agroecosystem. Finally the main legislation of agricultural practices of the region was considered, such as the *Norma Tecnica Obligatoria Nicaraguense* (Nton, 2012), that lays down the guidelines and procedures for characterizing, verifying, regulating and certifying the agro-ecological system; the *Reglamento Técnico Centroamericano* (Rtc, 2015), a binding supranational law document of 123 articles that proposes to regulate organic production and certification throughout Central America, through the alignment of the laws already existing in individual states.

3.4 Identification of indicators of smallholding farming sustainability

The following step of the participatory process consisted in planning and boosting several workshops in each country which allowed stakeholders to identify both a shared concept of sustainability and environmental, social and economic indicators to measure it. As a result, a long list of indicators came out and each one was allocated to the dimensions previously identified, namely the social, economic and environmental dimension. All stakeholders contributed in this phase identifying the indicators to be included within the tool. At the same time, researchers along with the academic sector were able to attribute various scores and ranks corresponding to each indicator. Finally, in order to allow stakeholders to get familiar with the tool and to test it, the analysis of an experimental group of farms owned by some of the participants of this part of the process has been carried out.

[II] *Sustainable Agri-Food Evaluation Methodology*.
[III] *Coeficiente de Manejo de la Biodiversidad*.
[IV] *Marco para la Evaluación de Sistemas de Manejo de Recursos Naturales Incorporando Indicadores de Sustentabilidad*.

3.5 Validation of indicators

Such indicators were later tested and validated on field visits by researchers and technical staff of agroecological movements involved in the process. A face to face interview methodology was designed based on a semi-structured questionnaire. A total of twenty field visits to agroecological small farms that produce coffee, cereals and livestock and twenty interviews to the respective holder have been realized in this phase in order to obtain farmers' perceptions on the tool and to assess its functionality.

3.6 Presentation of a new Sustainability Self-Assessment Tool: Hesofi

Finally, a workshop with stakeholders of the three countries was held to show the systematized results of the interviews and to present the new sustainability self-assessment tool. As result of the process, all stakeholders gathered together presented Hesofi[V], *Farm Sustainability Assessment Tool* its English name, the final assessment tool structured in 3 levels of analysis: dimensions, then components and finally indicators. Hesofi consists of 71 qualitative and quantitative indicators, distributed into 12 components, each gathered together in the 3 dimensions of sustainability (agro-environmental, socio-political-cultural and economic).

Hesofi aims to transpose the holistic view of sustainability into practice through stakeholder participation. This tool suggests a scientific complete insight of complex agricultural systems, considering also social issues, too often left apart in other methodologies for assessing agricultural sustainability.

Hesofi refers specifically to small-scale agriculture in Central America and therefore also to agroecological farms. It is a suitable tool for comparative analysis of sustainability of different farms at the same time, but also useful for comparison of the same farm sustainability at different times. This second feature of Hesofi permits to evaluate which sustainable practices need to be improved and whether sustainability has enhanced over time. These two connotations make this assessment tool useful for both farmers and agroecological movements. Hesofi is a tool, which rural populations can identify as their own. The acceptance of innovation by the local community is crucial, especially to ensure the use of the instrument not only for research but also for empirical small-scale systems management. This appropriation of the tool by stakeholders has been possible by its shaping through a successful participatory process.

[V] *Herramienta de Evaluación de la Sostenibilidad de Finca.*

4. DISCUSSION

The participatory process described in this paper showed some key success features. First, in order to achieve Hesofi, it was crucial to support a decision-making process that could take in consideration different points of view. During the participatory process the bottom-up approach was integrated with the top-down one to enhance a better appropriation of a scientific tool. The first approach captured the specific needs related to small-scale holding agriculture and allowed a better receptivity from the stakeholders of the indicators and the tool in its entirety. On the other hand, due to the employment of different methodologies, the top-down approach gave scientific validity to Hesofi allowing for a high value of international comparability.

Second, the process was much participated. In particular, the representatives of agricultural communities and agroecological movements showed since the very beginning of the whole process a deep interest to the research project, which led to an active participation into every step of the activities. Academic stakeholders were also very involved throughout the whole process. Moreover, it should be pointed out that the role of the field technicians was fundamental in order to succeed in the research and participation process. These persons are the engine of dissemination of local know-how through the Cac method. Without them, it would not have been possible to co-opt much of the stakeholders, who were finally involved. Whereas researchers promoted interaction within the agricultural science community and academics to combine and take into account the complexity of the participatory agroecological context and the diversity of all stakeholders.

Another successful element, that should be mentioned, was the presence of a consolidated multi-stakeholder network active on the field, namely agroecological movements and cooperatives, which permitted an advanced co-operation among the actors involved and therefore contributed strongly in spreading the process.

Finally, a key result of the participatory process is the common vision of what constitutes a sustainable farm according to all the stakeholders involved. This vision is multiform. Each indicator is created to measure the evolution of this vision over time, even if there were some indicators that could not be constructed due to lack of information. The tool contributes to the diffusion of sustainability self-assessment at a micro level, the farmers level, and at a macro one, the institutional level spreading a shared concept of sustainability.

On the other hand, the research project also showed some limits. Firstly, there were some marked context differences among the three Central American countries, which represented one of the main difficulties in conducting the participatory process. In those local realities where agricultural and

agroecological communities and organizations had strong roots showing high levels of activism, participation of the stakeholders to the process was intense. Otherwise, where the existing relational nets were not equally strong, participation levels were quite lower. Nevertheless, it should be mentioned, that the role of researchers helped to create a basis for a supranational networks and to foster dialogue and stakeholder participation among the different domains.

Secondly, it should be said that the validation phase started only in Nicaragua, while in the other countries the validation took place later without the presence of the researchers. Therefore local stakeholders directly led the final steps of the process. Hence, even if the research process finished, the participatory process is still ongoing and the dissemination is spreading. This shows that Hesofi accomplished to be a tool used and usable by the farmers' movements themselves.

Thirdly, a large limit that fostered the disparity among the contexts were logistical restraints to participation, e.g. the possibility to take part physically to the activities for those stakeholders who lived in remote rural areas. Distances and lack of resources contributed to this.

Finally, it should be stressed that the selection of stakeholders, on the one hand, was supported by the presence of an already existing network, but on the other it was flawed by it.

In conclusion, some topics remain open: firstly, concerns about the sustainability of the process itself are still open. Such a tool, useful and cost-free, is definitely a benefit for all the stakeholders involved. However, the participative process should continue to be managed in an enlarged and transparent manner.

Secondly, the scientific validation of the process and its positive results lay the foundation for the replication of this experience in other contexts. Although the methodology was focused mainly on agroecological farming, authors wish that this experience would be taken as reference for future initiatives that aim to develop participatory processes for measuring sustainability of agriculture and natural resources management.

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NOMENCLATURE

Cac	Campesino a Campesino
Clusa	Asociación para el Desarrollo (El Salvador)
Combrifol	Cooperativa Mixta Brisas de la Frontera (Honduras)
Comsa	Café Orgánico Márcala S.A. (Honduras)
Comucap	Asociación Coordinadora de Mujeres Campesinas de la Paz (Honduras)
Hesofi	Herramienta de Evaluación de la Sostenibilidad de Finca
Maonic	Movimiento de Productores/as Agroecológicos y Orgánicos de Nicaragua
Maoes	Movimiento de Agricultura Orgánica de El Salvador
Mesmis	Marco para la Evaluación de Sistemas de Manejo de Recursos Naturales incorporando Indicadores de Sustentabilidad
Milpah	Movimiento Indígena Lenca de La Paz, Honduras (Honduras)
Ngos	Non Governmental Organizations
Re.Te	Associazione Tecnici Solidarietà Cooperazione Internazionale
Saemeth	Sustainable Agri-Food Evaluation Methodology
San	Seguridad Alimentaria y Nutricional
Ues	Facultad de Ciencias Agronómicas de la Universidad de El Salvador
Unag	Nicaraguan Unión Nacional de Agricultores y Ganaderos (Nicaragua)
Una	Universidad Nacional Agraria (Nicaragua)
Una Catacamas	Universidad Nacional de Agricultura de Catacamas (Honduras)
Uni.Coo	Project University of Turin for International Cooperation

COOPERATION BEYOND DEVELOPMENT. RETHINKING INTERNATIONAL AID FOR THE SELF-DETERMINATION OF RECIPIENT COMMUNITIES.

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Sommario

Questo articolo propone un dibattito critico e costruttivo sui temi della cooperazione negli ambienti stessi della cooperazione, soprattutto sugli obiettivi reali e apparenti, sugli effetti sortiti inconsapevolmente, e sui vincitori e vinti dell'aiuto internazionale, il tutto visto da una prospettiva socio-economica mondiale. Sono qui presentati i primi esiti di un Seminario Partecipativo tenuto proprio su tali tematiche, articolato in quattro tavoli di lavoro: autodeterminazione e reciprocità, emergenza e sviluppo, formazione, co-progettazione / progettazione partecipata.

Abstract

A critical and constructive debate is proposed on and inside cooperation, specifically on the real and the apparent goals, on the unaware effects, and on the winners and losers of international aid, framed in a global socio-economic perspective. The first outcomes of a recent participatory workshop on such themes are hereby illustrated, divided in four working tables: self-determination and reciprocity, emergency and development, training, and co-design / participatory design.

Keywords

International cooperation, self-determination, post-development, critical theory, participatory approach.

Foreword

This contribution is intended to open a critical and constructive debate on and inside cooperation. It proposes the premises, incitements, and a report of a Participatory Workshop titled "Re-thinking the idea of development in international cooperation processes", held in Turin, Italy, on June 28, 2017, and animated by nearly one hundred participants. The idea to open such a debate has its roots in the authors' study, research, and cooperation experience with the Research and Documentation Centre in 'Technology, Architecture and City in developing Countries' (CRD-PVS) at the Politecnico di Torino, specifically within the postgraduate courses in Habitat, Technology, and Development (2013/14) and in Habitat & Cooperation (2016).

Introduction

International cooperation is driven by multiple reasons and interests, sometimes naively or purposely contrasting with the priorities of the recipient communities. A globalised world undoubtedly represents a complex system, where actions to tackle undesired effects might be addressed by mitigating consequences, or – more interestingly and effectively – by preventing them to happen. The prevailing economic paradigm, based on an endless growth named development, necessarily implies winners and losers while existing, besides being destined to an end due to the finiteness of our planet. Furthermore, resource requirements to support certain forms of development often undermine peace and cause displacement or international migration, while some forms of cooperation tend to try to balance social and environmental injustices and conflicts arisen in such a framework. More in general, the locution "development cooperation" suggests that help is provided to make up for a backward position and to align onto a predetermined path. We argue that such attitude risks to neglect and prevent some possible diversity in the original and punctual aims and expectations of the recipient peoples (self-determination), albeit the siren of a mono-cultural myth is more and more present worldwide. The disadvantaged position of many recipient countries or communities is often systemically related to a favourable position of who offers international cooperation, and the boundaries between Global South and Global North appear less and less clear due to increasing geo- political and human interconnections. We therefore suggest that a critical and constructive reflection on the role and the mission of Northern cooperation in the Global South might be timely and appropriate. We propose to focus on the most authentic priorities of the recipients, on the ethical dilemmas of international cooperation, and on the sometimes difficult relations with the local stake- and shareholders. Some of our main concerns are: why, for what, and for whom cooperation is performed. We suspect that such bases influence the modes in which international aid happens: its strategies and its approaches. The evaluation of effects on local communities as well as of the effectiveness of co-planning and co-design is also addressed. Finally, some considerations are made on what we can learn from interventions in emergency, what the mutual benefits of innovatively doing cooperation in a world in transition, and – at the same time – on how we can act to both prevent causing damage and provide thorough help in a systemic perspective. A multi-disciplinary debate is stimulated inside the cooperation communities, including the academic one, in order to meditate on the ultimate role of international cooperation, while improving the relations with local communities and keeping the attention high on the priorities of the recipients in the Global South beyond the paradigm of "local development".

A participatory workshop for a fruitful debate

After months of critical theoretical elaboration, started in late 2016, a Participatory Workshop was designed and organised at the premises of the Interuniversity Department of Regional and Urban Studies and Planning (DIST) of *Università di Torino* and *Politecnico di Torino*, Turin, Italy. The workshop took place on June 28, 2017, was titled "Rethinking the idea of development in international cooperation processes", and was animated by nearly one hundred participants, representative of several categories: practitioners in the field of international cooperation, scholars, professionals (architects, planners, engineers, geographers, sociologists, facilitators, etc.), graduate, undergraduate and postgraduate students, and members of Italian associations, NGOs, and other organisations. The workshop was opened by a plenary incitement by some of the organisers and by the moderators of four working tables, with participants later spontaneously joining such tables for a focused discussion. The four different working tables were named as follows: self-determination and reciprocity, emergency and development, training, and co-design / participatory design. Besides the figure of the moderator, each working group was composed of two more predetermined roles: a secretary and a rapporteur. At the end of the four parallel working sessions, another plenary was held to share the relative outcomes, which are proposed below in a synthesis specially prepared for the present contribution.

Workshop outcomes

Self-determination and reciprocity

With the goal of critically tackle the current approach to international cooperation actions, this working group focused on two main aspects: self-determination and reciprocity, jointly meant as the right of recipient communities to express their own needs[1], and their compatibility with the international cooperation actions. Important starting questions of the table were represented by *Who needs whom?*, *When and how to intervene?*, and *Who learns from whom?*. The group was composed of experienced practitioners in the field of international cooperation, including scholars and instructors training cooperation figures, PhD students, representatives of NGOs and cultural associations. The debate started from the analysis of the historical, political and economic conditions that defined the framework within which international cooperation usually happens. A critical approach to the idea of development, especially when considering that the locution

[1] While the authors are aware of the fact that - just like "development" - "needs" is a toxic word, as proposed by Sachs, Illich, Shiva, and others (cf. Sachs, 1997), such word was used by many participants to the Participatory Workshop at issue. In this contribution, we keep such word to refer to the most authentic priorities and requirements of a recipient community, possibly free from the influence of the Northern imaginary.

"development cooperation" is most often used when talking of international aid. The debate is articulated in readings (Harry Truman's 1947 State of the Union Address, cf. Truman 2004; the description of the figure of the explorer by Michel De Carteau, 1980; the economics of the "develop-man" by Marshall Sahlins, 1992) and shorter quotations (e.g. from Italian anthropologist Remotti or Indian economist and philosopher Amartya Sen), to which each participant replies with his/her opinion, often bringing practical examples coming from his/her professional experience. A key point of the discussion was the need to identify third-party's needs; in fact, the Global South - eloquently defined by many as *developing* countries - is too often not seen as alterity, but as a late version of ourselves (the North): something that Fabian (1983) calls *allocronism* (i.e. the habit of not recognising the contemporaneity of the object of an ethnographic observation), and that lies at the basis of the ethnocentric concept of backwardness, or - indeed - underdevelopment. Such ethnocentric judgement - be it implicit or explicit - has activated in the Global South a mechanism of internalisation of the other people's look over oneself, averagely leading a Global Southern person to feel inadequate, to deplore oneself, and to sometimes even repudiate his/her own culture to open to modernisation. The working group wondered how cooperation contributes to reinforce such sense of backwardness, arguing that this might happen in two ways: on the one hand, at a level of imaginary, since the very presence of cooperation agents lets suppose the existence of a problem to be solved; on the other hand, at an economic level, both through the introduction of money to solve the aforementioned problem (e.g. for local collaborations to a project) and through the transfer of the idea of poverty, which is a relative concept and depends on monetary economic models. In so doing, cooperation often forgets that, if necessary, many populations traditionally satisfy the primary needs of their members through solidarity and social cohesion, something less and less present in the Global North instead. In addition to the discussion of the problems, the working group at issue also defined some possible strategies and solutions, starting from the proposal to remove those obstacles already observable in the political-institutional attitude of Global Northern countries - such as the ethnocentric arrogance - as well as to stop the narrative according to which cooperation bases on third-party's misfortunes; among the other proposals: to act at an equal level, by focusing on the other's subjectivity and providing tools so that this becomes able to satisfy his/her own needs according to his/her own values; to valorise the building up of relations, not limiting to perform a great action, thus avoiding to import (or export, depending on the point of view) a model. To remove the obstacles, both cultural and political actions are needed; at the same time, cooperation agents can still find out - before a real and full change is achieved - other ways of interacting with "the other", hopefully able to favour the ability of

recipient communities to set their own needs and then take actions to pursue them, while allowing for their right to self-determination to be autonomously chosen as a priority.

Emergency and Development

The group that discussed the topic "*Emergency and Development*" was formed by NGO's operators, professionals, students with different background and representatives of decentralised cooperation player based in Turin, Italy. These are the most important questions of the discussion:

- How much the emergency can teach in terms of development?
- How to manage the emergency not in punctual way but with a middle-long period approach? Which kind of development?

Taking our cue from a reflection emerged at the end of the debate, the risk incurred by international cooperation is that of "simplifying the complexity", going to identify nearsighted and not farsighted solutions to respond to cyclical or predictable matters: diffused self-absolving actions yielding addiction to aid without addressing an issue systemically, standardised management of the emergencies, scarce care of the follow-up. The debate ocused on the meaning of some words such as *cooperation, emergency,* and *development*. As a result of this consideration, it has been useful to recognise a common dictionary throughout the entire debate in order to represent the difference between the plurality of meanings. The word *development* is known as a word full of controversies. Yet, in this working group, many experts in development cooperation found it difficult to look critically at this word: as usual in similar circumstances, some said that it can be used in different ways and contexts (asking e.g."which kind of development?"); some other suggested that the term *development* is not only referred to a negative sense that involves the "imposed prototype", while defending debated agendas such as the United Nations 2030 Sustainable Development Goals. The term *emergency* was also object of analysis. It was proposed that it is dangerous to define the word *emergency* to refer to a situation that was not attended and could not be prevented. Some international policies can evolve into local actions and can be a solution for emergency situations only following a punctual way of action and not a strategic point of view: emergency is a phenomenon that has to be governed first of all with prevention. An approach which only considers the resolution of a conflict can bring a lack of consideration of conditions and specific cultures that can be involved. The main question is: who can define what is an emergency? And which conditions can characterise an approach oriented to a development of an emergency context? It is possible to act by doing some " ordinary actions in a non-common context", for example in an emergency situation which has been protracted for a long time or it can be repeated in a cyclical

way. So what can be done? Lots of experiences and ideas were shared and can be resumed in an attitude that can involve directly people in a situation of emergency during the planification of "new methods", with the possibility to applicate qualitative standards and mixing them with the solution of local experiences. New kinds of experimental approaches can transform some standards into "useful and good" solutions individuated in the context. The responsibility of these solutions is always to find an "escape way": the community might be able to be self-sufficient by sharing objectives ad autonomies with the operators and the internationals organisations. local actors might be able to receive a politic and contractual recognition (*accountability).* Due to its current favourable position, it is up to the cooperation to "remove the obstacles" that determine positive intervention directly to the *empowerment* and to generate resilience with slow approaches and cooperative methods that can conduct to the autonomy of the community involved.

Training

In the general debate outline, the Training working table focused its discussion on the connections between the academia and the cooperation field as well as on the current state of on-field players training. It came clear how an *exante* knowledge can sometimes be a limit in being opened to natural dynamics and processes. All the participants at the table had previous personal experiences into cooperation besides the professional ones: there were delegates from the academic world devoted to International Cooperation, NGOs, private foundations and cultural associations workers, and a delegate of the appointed department of Turin-based regional administration *Regione Piemonte*. The discussion started through some open questions, which the participants answered to through examples from their own direct experiences as well as by raising other consequent doubts and questions: "Why training, for which and whose needs?"; "Training to be able to train or to be able to exchange?"; "In this process, how much permeable are we to the people we are supposed to train?". During the debate, the crisis of the academic world came out regarding the ability to offer an adequate approach to the on-field training. Those who have academic competences are often affected by a conditioning that leads them to consider their learned knowledge as the only valid method that needs to be taught and they tend to forget how the basis of the scientific method is the continuous checking of the method itself and its questioning following direct field experiences. By proceeding with the current dynamics, the risk is to trigger a new kind of colonisation, as an imposition of models decided *a priori*. The acquired method is instead a starting point to be integrated, modified, and - possibly - also overturned. It came out that a fundamental point is represented by mutual exchange as well as by the need to lower the expectations to "control", which

we usually carry with ourselves. This could be achieved e.g. by thinking we already know all the possible mistakes and evolutions, and the knowledge and skills that need to be taught. It is crucial to listen open-mindedly and establish bonds based on trust, to use models that may be unusual to us, to create a syncretism that develops a more virtuous and inclusive process that will have results on the long run and that will be more structured and settled in. A discussed example that proved these points was the case of a Togolese agronomist who studied his science in France and, as he was working in the International Cooperation, he proposed an occidental cultivation method in Burkina Faso. After one year, he went back and he found out that it was like nothing happened and the method had not been acquired. The main problems were the lack of an authentic exchange and of the creation of strong relations. Training, be it academic or self-made, for people who work in the cooperation field or who are involved by it should be based on the construction of exchange relationships with those who are the beneficiaries and with possible partners from other professions. In the end, talking about training means talking about co-training: to combine the personal expertise with those of others to complete each other's knowledge and to generate new methods and overturn the usual approach by ensuring that the beneficiaries can teach their knowledge.

Co-design / participatory design

This fourth working table focused on the concept of *co-design (participatory design)* as an important tool in the hands of professionals and institutions. The participatory approach grounds its roots in the conviction that the design processes, originated by mobilisation of individual and collective energies, leads to the creation of better environments and spaces that are a truer expression of the local culture. Participatory design is, also, a topic that has been used more and more in recent urban planning history and even more recently in the field of international cooperation. This recurrence and its importance as a tool are the reasons why the organising committee decided to introduce this theme into the debate. The working group "co-design", was composed of people who deal with international cooperation as either volunteers or professionals for NGOs, NPOs, associations, or institutions. Throughout the entire debate, the discussion revolved around two specific concepts: role and active listening (cf. Sclavi, 2003). If we refer to the classic WH-questions, the first concept - role - answers at the same time to who and which. Who are the actors? Which role does each actor fulfill in the participatory process? Which are the ultimate aims of the process? The group identified three different realities within the cooperation field that have to work together to reach common aims: institutions, NGOs, and civil society. In particular, in conflict contexts, the role of school as institution emerged as fundamental to guarantee

a more honest and balanced process. In this frame, a professional fulfills the role of facilitator, without pre-established design plans. The project is, and should stay, an open even where he/she brings his/her perspective, on the same level of the other actors, avoiding modernist and colonialist approaches that arise from the belief in some kind of hierarchy and superiority of somebody. The second concept - active listening - answers to the question of *how* and is strictly related to this professional's role of facilitator. To be a good facilitator, the professional needs to gain a deep knowledge of the local context and at the same time be able to listen to all its actors. Only by implementing the tool of active listening it is possible to find creative and innovative solutions, and only through the definition of shared aims it is possible to obtain real outcomes, paying attention not to confuse the aims with the values. Values are always in the running during discussions, but are hardly changeable or truly shareable, and - because of that - cannot represent the object of negotiation. The discussion at the working table ended with the assumption that co-design practices can be innovative and groundbreaking only if their tools are institutionalised as part of an officially shared "way of doing", i.e. they no longer depend on the deal of initiative of isolated individuals Only through the formalisation and recognition processes we can achieve durable and effective results.

Conclusions

At the end of the working sessions of the Participatory Workshop, a need is confirmed for a critical and constructive debate on and inside cooperation. For many aspects and for many people, it was hard to put one's habits and beliefs into question, as if one would prefer to keep making mistakes (and damages to the recipients) instead of no longer being sure about how to act. However, several interesting considerations came out of the workshop. First of all, speaking of self determination and reciprocity, the need to reject an anthropocentric approach by importing/exporting a model, and insteadto act at an equal level, to focus on the other's subjectivity, and to provide the recipient with tools to satisfy his/her priorities according to his/her own values; the importance of valorising the building up of relations was also reported. The removal of obstacles needs cultural and political actions. In this framework, before a real and full change is achieved at a systemic level, cooperation agents can nevertheless start finding out alternative approaches to interact with the other. As per the considerations on emergency and development, solutions to face emergencies have responsibility to let the recipients be self-sufficient, including granting local actors some politic or even contractual recognition. Even in emergency situations, removing the obstacles to the recipients' autonomy will yield improvements in their empowerment, and ease their resilience e.g. through slow and

cooperative approaches.Training should be based on relations of exchange, in order to mix knowledge and skills that are not necessarily "better" and "worse" *a priori* in the cooperation agent and in the recipient, respectively: local knowledge in the Global South might be of great help to Northern actors, both for local cooperation projects and maybe even for the rethinking of Northern habits and policies too. As to co-design practices, these should be encouraged, maybe becoming an "official" approach for cooperation projects, and not just an insolated initiative. Although the debate could go further and deeper following the introductory incitement, thus challenging the very role of cooperation and its function within a complex globalised socio-economic system, the discourse seems quite satisfactory if we consider that – to the best knowledge of the author – this represent the first collective attempt to address similar issues through a very participated participatory approach.

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List of acronyms

CRD-PVS *Centro di Ricerca e Documentazione Tecnologia, Architettura e Città nei Paesi in Via di Sviluppo* (Research and Documentation Centre in Technology, Architecture, and City in Developing Countries), Politecnico di Torino, Turin,Italy.

DIST *Dipartimento Interateneo di Scienze, Progetto e Politiche del Territorio* (Interuniversity Department of Regional and Urban Studies and Planning), Università di Torino and Politecnico di Torino, Turin, Italy.

NGO non-governmental organisation

NPO non-profit organisation

THE ITALIAN MULTI-STAKEHOLDER PLATFORM AND THE GUIDELINES FOR "ENERGY AND DEVELOPMENT"

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Abstract

In line with the national and international context, where energy emerges as a means for development, and not an end in itself, the definition of strategic objectives and implementing strategies for energy and development needs to be based on an inclusive and integrated approach including all the implications of energy on social, economic and environmental dimensions. Looking at the Italian perspective, the UNESCO Chair in Energy for Sustainable Development at the Department of Energy has launched a new initiative, by proposing the activation of a 'Multi-stakeholder Platform for Energy in Development', to define a first national pilot experience of multi-actors collaborations including institutional and private sectors, civil society, academic and research sectors. The overall objective of the Platform is to identify, formulate and validate energy intervention strategies in line with the SDG7. In May 2016, the Platform has started the elaboration of the 'Guidelines for projects in Energy & Development'. The guidelines contribute to define a national framework for planning energy projects in the development cooperation, referring to the best practices existing in the international framework.

Introduction

The last two years has represented a pivotal momentum engaged by the international community in the shift of the development paradigm and of the global agenda for the following decades. The Sustainable Development Goals, formally launched in September 2015 as one of the main asset of the UN 2030 Agenda, are intended to introduce a new comprehensive paradigm of development: a new asset for partnership, to overcome the difference between donors and recipients, where challenges find common and shared solutions. More specifically, the global challenges included in the Agenda are deeply interconnected and range from food to water, from energy to raw materials, from urban development to job creation, from disaster prevention to ocean preservation. Within this framework, energy comes to be crucial for sustainable development (Goal 7) and, therefore, an adequate and secure access to energy represents an instrumental right that should be granted both in developed and developing economies (Holden, Linnerud, and Banister 2017; United Nations 2012).
In line with the national and international context, where energy emerges as a means, and not an end in itself, the definition of strategic objectives and implementing strategies for energy and development, needs to be based on an inclusive and integrated approach including all the

implications of energy on social, economic and environmental dimensions. The intervention needs to match energy needs and appropriate energy resources, by improving the quantity and quality of energy supply, by promoting a combination of cleaner and more efficient fuels and adopting mainly (though not exclusively) renewable energies. This may then boost local socio-economic development and align national policies to the SDGs while giving to access to energy the right perspective (Colombo, Bologna, and Masera 2013).

On an Italian perspective, with the Law "General Rules Governing International Development Cooperation[1]", a new framework for the Italian cooperation sector has been opened, in which the role of cooperation represents a relevant element for the foreign affairs strategy. New experiences and competences coming from the academia, the research and private sector will join and enhance the traditional role of the organizations from the civil society and the territorial cooperation, and they are called to contribute with an increased proactive approach. Through the respective mission mandates, several opportunities to test public-private collaborations can be therefore realized, that may lead to a new approach able to bring value to the Italian System and promote joint, effective, efficient and locally valuable actions. As also stated in the programmatic lines of 2016-2018, among the central topics of the Italian cooperation, energy represents a basic dimension within the wider environmental topic, in particular referring to the relations between Italy and the African countries. The action of the Italian Cooperation will be then based on a vision of energy as precondition and instrumental right for guaranteeing access to basic needs as lighting and food safety, to further provide access to main services of the community as education and health, and to act as leverage for local development, when supplied for productive uses or income generating activities.

Within this framework, the UNESCO Chair in Energy for Sustainable Development at the Department of Energy has launched a new initiative, by proposing the activation of a 'Multi-stakeholder Platform for Energy in Development', to define a first national pilot experience of multi-actors collaborations, which may count on a rich and extensive framework of Italian expertise and competence, and includes institutional and private sectors, civil society, academic and research sectors. The overall objective of the Platform is to identify, formulate and validate intervention strategies

1 Italian Law 11 August 2014, no. 125

in line with the SDG7, to promote synergic actions related to energy and sustainable development, able to combine interventions of high impact for local and autonomous development with equal promotion of Italian of culture, education, research and industrial innovation. The platform is coordinating with the Italian Agency for Cooperation and with the General Direction for Cooperation to Development of the Italian Ministry of Foreign Affairs and International Cooperation.

In May 2016, the Platform has started the elaboration of a shared document on 'Guidelines for projects in Energy & Development', which is now close to the finalization and approval (DGCS, Italian Agency for Cooperation, and Politecnico di Milano 2017). The document has been developed through a coordinated action between the stakeholders and contributes to define a national framework for planning energy projects in the development cooperation, in relation the best practices existing in the international framework.

The guidelines are structured with an informative and a methodological part. After an introductive chapter where the link between energy and development is introduced, a focus on the Italian context is presented, highlighting the national tradition and international commitment in the energy sector. Reference policies, financial schemes & business models are proposed, which represent best practices consolidated at international level. The last two chapters aim at giving an overview on the strategic objectives for the actions of the development cooperation, proposing a needs-based approach and mapping quality attributes for interventions, beyond a binary and quantitative metric. Attention is also given to the relevance of local capacity development. Some criteria regarding the different phases of identification, formulation and monitoring are also specified. These criteria are complemented with other recommendations in terms of specific attributes for energy-related activities.

The Multi-stakeholder platform Energy and Development and the Italian guidelines Strategic objectives and implementing strategies

In line with the national and international context previously described, where energy emerges as a means, and not an end in itself, the definition of strategic objectives and implementing strategies for energy and development, needs to be based on an inclusive and integrated approach including all the implications of energy on social, economic and environmental dimensions. The intervention needs to match energy needs and appropriate energy resources, by improving the quantity and quality of energy supply, by promoting a combination of cleaner and more efficient fuels and adopting mainly (though not exclusively) renewable energies (Nissing and von Blottnitz 2010). This may then boost local socio-economic development and align national policies to the SDGs while giving to access to energy the right perspective.

Need-based perspective

Energy can be leverage to development when it is designed to cover people's needs which may be classified according to the following standard needs:

(i) household level
(ii) community services
(iii) productive uses in industry and enterprises
(iv) productive uses in agriculture
(v) integration of resources

For this reason, energy interventions are strongly recommended to tackle one of these needs improving these services, in accordance with some reference standard presented below (Colombo et al. 2013).

Multi-attribute mapping

Moreover, energy access needs to be classified beyond a binary metrics ("having" or "not having access") including a more detailed breakdown into Tiers or Levels of access. The Multi-Tier Framework (MTF) of the World Bank proposed within the SE4ALL Global Tracking Framework report 2015 is the reference (IEA and World Bank 2015).

Tiers are based on a number of attributes such as capacity, duration, reliability, quality, affordability, convenience, safety, health, legality, and all the projects aiming at addressing access to energy should be able to provide information about the changing in these attributes before and after the project. Slightly different attributes are detailed for the different category of intervention as reported in the following paragraphs. Within the Tiers, information about the types of technology that deliver the energy attributes are added, highlighting the key role that suitable technologies can play to each level.

Household level and reference standards

Need-Based perspective: Providing basic needs and services to people is fundamental to human rights and equity, as well as for households' daily life. At household level, energy access and energy efficiency should guarantee the achievement of a sufficient access to the full range of energy supplies required to support human development. An affordable and reliable electricity service should allow families to benefit of safe indoor lighting and to power key communication devices, such as radios and mobile phones, while the access to more efficient and cleaner technologies for cooking and heating would allow decreasing health risks and environmental degradation.

Table 1 – Indicative multitier framework for household electricity access

Tier	0	1	2	3	4	5
Energy supply attributes	**Continuous spectrum of improving energy supply attributes, including quantity (Watts), duration (hours), evening supply (hours), affordability, legality, quality (voltage)**					
Energy services	None	Electric lighting, radio, mobile phone charging	Tier 1 + multi-bulb lighting, air circulation, TV	Tier 2+ water heater, rice cooker	Tier 3 + refrigerator, mechanical loads	Tier 4 + electric cooking, space heating and cooling
Likely energy supply technology (indicative)	None	Solar Lanterns	Stand-alone home systems	Mini-grids with limited supply or poor grid connection	Unreliable grid with limited supply	Reliable grid with 24-hours supply

Table 2 – Indicative multitier framework for household cooking solution

Tier	0	1	2	3	4	5
Household cooking attributes	**Continuous spectrum of improving energy supply attributes, including overall emissions, indoor emissions, fuel use (efficiency), safety and health impacts**					

Likely energy supply technology (indicative)	Traditional cook stoves + solid fuels	Traditional cook stoves + solid fuels Improved cook stoves + solid fuels	Improved cook stoves + solid fuels	Improved cook stoves + solid fuels Kerosene cook stoves Advanced cook stoves + solid fuels	Kerosene cook stoves Advanced cook stoves + solid fuels Gaseous fuels such as LPG, natural gas, biogas	Gaseous fuels such as LPG, natural gas, biogas Electric

Multi-attribute mapping:

Table 1 and Table 2 are two representations of the Multi-Tier framework (MTF) adapted for the energy needs at household level, both for electricity and cooking. In addition to the energy supply's classification in 6 Tiers, some information about the types of technology that deliver the energy attributes (performances, such as capacity, duration, affordability, reliability, etc.) are added. A higher Tier represents the possibility of access to more modern energy services or improved energy efficiency to improved well-being for users. Table 3 proposes some minimum standards household services and may represent a reference for project planning.

Table 3 – Total Energy Minimum Standards (Practical Action 2010, 2012, 2013)

Energy service	Minimum standard
Electricity	250 kWh per household per year
Lighting	300 lumens for a minimum of 4 hours per night at household level (comparable to a 30 W incandescent bulb)
Cooking and water heating	1 kg wood fuel or 0.3 kg charcoal or 0.04 kg LPG or 0.2 litres of kerosene or biofuel per person per day, taking less than 30 minutes per household per day to obtain
	Minimum efficiency of improved solid fuel stoves to be 40% greater than a 3-stone fire
	Annual mean concentrations of particulate matter (PM2.5) < 10 μg/m^3 in households, with interim goals of 15 μg/m^3, 25 μg/m^3 and 35 μg/m^3
Space heating	Minimum daytime indoor air temperature of 18°
Cooling	Households can extend life of perishable products by a minimum of 50% over that allowed by ambient storage
	Maximum apparent indoor air temperature of 30°C
Information and communications	People can communicate electronic information from their household
	People can access electronic media relevant to their lives and livelihoods in their household

Community services and reference standards

Need-base perspective: Adequate energy access and energy efficiency are key factors also for improving the quality and the quantity of the access to several social services, among which education (schools and training centres), health (hospitals, clinics), public institutions and others infrastructure services such as water grid, street lighting and drainage systems. The availability and the affordability of modern energy services within a community would trigger a positive feedback on other social issues such as gender equality and women empowerment, digital divide and access to information and communication technologies, climate change and environmental preservation.

Multi-attribute mapping: In order to classify and measure the possible levels of energy supplies for education and health centres, two specific Multi-Tier Frameworks for school and health-care facilities are presented in Table 4 and Table 5. These frameworks are able to measure access to energy, prioritizing services as well as supply-side perspectives, for education and health-care provision. They can be used in order to track improvements in education and health facilities through new strategies on energy access and energy efficiency, or to better guide future interventions.

Table 4 – An indicative framework for defining and measuring access to energy for schools

Tier	**0**	**1**	**2**	**3**	**4**	**5**
Attributes of energy accessed	**Continuous spectrum of improving energy supply attributes, including adequacy, availability, reliability** →					
Energy applications: *Basic energy services*	Lighting	Limited task lighting + mobile phone + radio + cooking	Tier 1 + limited general lighting + air circulation + VHF radio + cooking + space heating	Tier 2 + multiple lighting + air cooling + refrigeration	Tier 3 + air cooling / heating	All applications are feasible
Energy applications: *Teaching equipment*	None	None	Limited computer use	Projector + Laboratory equipment + Multiple computers w/internet	Tier 3	All applications are feasible
Likely energy supply technology (indicative)	Kerosene lamps + Candles	Third-party charging + Improved cook stoves	Small stand-alone solar PV + Kerosene/gas refrigerator + Institutional cook stoves + Biomass heater	Mini-grid connection + Unreliable Grid Connection + Incinerator	Mini-grid connection + Unreliable Grid Connection with backup	Reliable grid connection

Table 5 – An indicative framework for defining and measuring access to energy for health centers

Tier	**0**	**1**	**2**	**3**	**4**	**5**
Attributes of energy accessed	**Continuous spectrum of improving energy supply attributes, including adequacy, availability, reliability** →					
Energy applications: *Basic energy services*	Lighting	Limited task lighting + mobile phone + radio	Tier 1 + limited general lighting + air circulation + VHF radio + cooking	Tier 2 + multiple lighting + air cooling + refrigeration + computers w/internet + TV	Tier 3 + air cooling / heating	All applications are feasible
Energy applications: *Medical equipment*	None	None	Vaccine refrigeration + sterilization	Low power medical appliances (microscope, testing equipment, etc.) + incineration	Tier 3 + high power equipment (x-ray machineries, ultrasound, scanners, etc.)	All applications are feasible
Likely energy supply technology (indicative)	Kerosene lamps + Candles	Third-party charging + Improved cook stoves	Small stand-alone solar PV + Kerosene/gas refrigerator + Solar autoclave + Institutional cook stoves	Mini-grid connection + Unreliable Grid Connection + Incinerator	Mini-grid connection + Unreliable Grid Connection with backup	Reliable grid connection

Productive uses in industry and enterprises and reference standards

Need-based perspective: in developing countries Micro and Small Enterprises (MSEs) sometimes called rural industries may have several benefits on the local community, mainly if supported by an adequate access to energy and energy efficiency. However, each MSE has its own specific requirement and therefore specific energy services. Within each category (electricity and/or thermal energy) the amount of power and the form of energy supply may vary depending on the activities, on the scales of operation, and also on local culture and traditions. Energy services include process heating and cooking, mechanical processing, cooling, manufacturing, repair and powering ICTs services. Improved energy services can indirectly support product manufacturing or service delivery while also contributing to improve process efficiency, thus increasing indirect returns for the enterprise. Energy access may assume an important role also within the income generating activities in rural areas, where rural industries has become an essential component of rural economic transformation to supplement agriculture-based incomes and to mitigate rural–urban migration. Enterprises often need different energy supplies and qualitative factors and to define a set of minimum energy service standards for Practical Action has developed an Enterprise Energy Matrix (Table 6), which provides specific indicators for energy access and efficiency, useful when providing electricity, fuels, mechanical power, and appliances to enterprises. Quantitative threshold are not defined since the variate of the case is too wide.

Table 6 – Enterprise Energy Matrix (source: Poor People Energy Outlook 2013, Practical Action)

	Electricity	**Fuels**	**Mechanical power**	**Appliance**
Reliability	Availability (hours per day) Predictability (timetabled or intermittent)	Availability (days per year)	Availability (days per year)	Downtime (%), linked to ease of maintenance and availability of spare parts
Quality	Voltage and frequency fluctuation (+/- 10%)	Moisture content (%)	Controllability	Convenience, health and safety, and cleanliness of operation
Affordability	Proportion of operating costs (%), including capital cost payback if financed	Proportion of operating costs (%) Time to gather as proportion of working day (%)	Proportion of operating costs (%) Time spent (if human powered) as proportion of working day (%)	Proportion of operating costs (%) including capital cost payback if financed
Adequacy	Peak power availability (kW)	Energy density / calorific value (MJ/kg)	Peak power availability (kW)	Capacity compared with available resource and market (% capacity)

Multi-attribute mapping: An additional representation of the MTF for measuring energy access for productive uses is shown in Table 7. This frame considers mechanical energy as the main form of energy used for people's livelihoods, even if the energy supply for productive uses comprises a wide range of possible uses. Mechanical power technologies are typically high-energy devices that may include machinery for water pumping, agricultural production and agro- processing, small-scale

manufacturing. This kind of energy can be generated from different energy resources, including human, animal, renewable (commonly hydro and wind, such as hydro-driven appliances or wind-powered power pumps), engines and electricity-using motors.

Table 7 – Indicative multi-tier framework for mechanical power for productive uses

Tier	0	1	2	3	4	5
		Possible energy technologies for key livelihoods activities				
Water pumping	Bucket	Treadle pump	Hydraulic ram pump	Water current turbine	Solar PV water pump, motorised pump	High power electric pump
Agro-processing	Hand pounding	Animal powered mill	Traditional water mill	Improved water mill	Diesel-powered mill	High power electric mill
Small-scale manufacturing	Hand tools	Treadle tools	N/A	Mechanical lathe	Engine-powered circular saw	Electric saw
Likely energy supply technology resource	Human power	Human power Animal power	Animal power	Animal power Engine	Engine Electrical Power	Electrical Power

Productive uses in agriculture and reference standards

Need-base perspective: The availability of modern energy has proven to be essential in increasing the productivity of the agricultural sector. A reliable energy access and efficiency can add value all along the food supply chain and to move away from subsistence agriculture. Direct energy uses comprise land preparation, cultivation, irrigation, harvest, post-harvest processing, storage, and the transportation of agricultural inputs and outputs. Instead, indirect uses imply fertilizers and other products, sometimes necessary, such as weedicides, pesticides, and insecticides.

Multi-Attribute Perspective: rural enterprises can take advantage from a higher penetration of modern energies, particularly renewable, in order to improve their costs effectiveness, or reduce dependency from centralized electricity or fuels. Moreover, energy efficiency may increase productivity, while saving time and effort, and increase earnings through new market opportunities. Greater agricultural productivity requires improvements in each stage of the agro food production chain: agricultural production, agro-processing, post-harvest and storage facilities, distribution and retail. Table 8 outlines these activities, classified according to the specific energy supply they require.

Table 8 – Energy inputs to enable activities in the agricultural value chain

	Electric Energy	Mechanical Energy	Thermal/Chemical Energy and Fuels
Production	Irrigation	Land preparation, Planting, Cultivation, Irrigation, Crop protection, Harvesting, Threshing	Fertilising, Crop protection
Processing, post-harvest and storage	Drying, Milling, Pressing, Packing, Storing	Milling, Pressing, Packing, Storing	
Distribution and retail	ICTs, Training, Selling	Transport	Transport, Selling

Mechanical power is a particularly important input in any farming system, even if many rural areas are still based on human and animal energy for tilling, harvesting, processing and rain irrigation (Bazilian et al. 2011). However, the application of renewable energy technologies (e.g. wind pumps, solar dryers, water wheels, biomass conversion technologies), fossil fuel-based technologies (e.g. diesel engines and pumps) or hybrid systems (a combination of both) for motive and stationary power applications and for processing agricultural products, would allow a better productivity and effectiveness. The type of farm-power system represents a key factor in determining the area of land they can cultivate. Human-powered farms typically cultivate 1-2 hectares (ha) per year, draught animal hirers cultivate 2 ha, farmers owning draught animals cultivate 3-4 ha, tractor hirer cultivate about 8 ha, and farmers owning tractors cultivate more than 20 ha (Kienzle and Sims 2006).

Hence, well-designed policies must take into account factors like mechanization, organic farming and job creation in order to increase productivity, improve quality and quantity of products at less time and efforts, and encourage new market opportunities without damaging environment nor social inclusion.

Integrated management of Water-Energy-Food Nexus and international frameworks

Need-base perspective: a nexus-oriented approach is needed to address unsustainable patterns for human security and to address the causes by identifying effective points for intervention. The recognition of the relationships at local level among the elements of WEF is required to plan for investments, policies and actions. A framework of action should take a holistic approach to reduce unintended consequences and trade-offs, and generate additional benefits.

Multi-attribute mapping: Elements of water, energy and food security are proposed by the International Institute for Sustainable Development (IISD) (Kienzle and Sims 2006). Elements of food security can be categorized in: (1) food availability: influenced by production, distribution and exchange of food; (2) access to food: including affordability, allocation and preference; (3) utilization: nutritional

value, social value and food safety (4) food stability over time. Water security includes: (1) water access; (2) water safety; and (3) water affordability in terms of ability of people to lead a healthy and productive life, while ensuring environment protection. Energy security includes: (1) continuity of energy supplies relative to demand; (2) physical availability of supplies; and (3) supply sufficient to satisfy demand at a given affordable price.

The framework of action is generally centred on available water resources, connecting energy and food security, and including urbanization, population growth and climate change consequences (Hoff 2011). An advanced framework can link food and water security to economic disparity and governance, causing water and food shortages in case of failures, and energy security to economic risks in the form of energy shortages with impacts on growth and social stability (Schwab, Sala-i-Martin, and others 2010). This framework also includes population and economic growth as well as environmental pressures affecting the nexus. In addition, it requires the identification of specific relationships among the elements of WEF, such as intensity of energy use in food production as well as water use in both food and energy production.

Recommended multi-attributes descriptive for energy solution planning

After defining some recommended criteria, additional recommendations are worth to be done in order to align the Italian approach with the best practice at international level by defining three categories: 'electricity' and 'thermal energy' and 'efficiency'. For each of these categories, some attributes (Table 9, Table 10 and Table 11) are provided in order to determine the "usability" and the quality of the energy service. Attributes represent some performance indicators of the energy service, useful both in planning and evaluation phase. Attributes state the coherence with the efforts made by the World Bank in going beyond a binary metrics ("having access" or "not having access"). The use of this multi-attribute descriptive will help the Italian system of cooperation to account for the achievement of any programme according to this new metrics.

Table 9 – Attributes for electric energy

Attributes for Electric Energy		
Electricity for household level, community services and productive uses		**Lighting**
Capacity	Safety	Lumen Hours per Household
Duration	Health	Phone Charging Capability
Reliability	Legality	Use Behaviour
Quality	Services / Activities	
Affordability	Specific consumption p.c	
Convenience	Service or Activity	

Table 10 – Attributes for thermal energy

Attributes for Thermal Energy	
Household Cooking	**Space heating and other thermal uses**
Indoor Air Quality	Capacity
Cook stove Efficiency	Duration
Test method	Reliability
Convenience	Quality of fuel
Safety	Affordability
Affordability	Convenience
Quality of fuel	Safety
Availability of fuel	Indoor air quality
Services / Activities	Services / Activities
Specific consumption p.c	Specific consumption p.c
Service or Activity	Service or Activity

Table 11 – Interventions to improve Energy Efficiency

Interventions to improve Energy Efficiency	
Improvement of Efficiency	Legalization of supply
Improvement of Capacity	GHGs reduction
Improvement of Duration	Local pollution reduction
Improvement of Reliability	Services / Activities Increase of the Specific Consumption
Improvement of Quality (Service)	Lighting
Fuel Switch	Change in Lumen Hours
Higher Affordability	Additional Phone Charging Capability and other services
Convenience compared to other solutions	Use variation by users
Improvement of safety	Metering
Improvement of health (included Air Quality)	

Recommended criteria for projects in 'energy and development'

On a general perspective, 10 criteria seem to require special attention in the field of energy. Some of them are already included in the best practices for cooperation projects and they represent well known standard of reference. They are below broken down into the three main phases of a project planning: identification, formulation and monitoring and are also briefly presented at the light of the energy-development nexus.

Identification phase

In the identification phase where the project needs to be drawn, while analysing the problem, the objective, the stakeholders and the strategy, the items listed in Table 12 are recommended.

Table 12 – Specific criteria for the Identification phase

Criteria 1-4	Specific step in Identification	Description
Involvement and ownership of beneficiaries	Problem analysis and target identification	The approach related to the involvement of local beneficiaries within the project and the main actions intended to increase local ownership need to be described in details. The direct and indirect benefit of the project over the local community has to be clearly highlighted. Beneficiaries need to be recognised as partner in the project since this may effect long term duration and outcome of the project. This asset is strongly recommended
Multi-stakeholders partnership and their specific role	Stakeholder analysis	The presence of a diverse group of stakeholders needs to be highlighted. Each stakeholder should be characterised with a specific role and mandate within the project. Motivation for each stakeholder to participate to the project should also be stated clearly as well as the global governance of the consortium. Avoid overlapping and enforce synergies with other actions by the same stakeholders in the same areas. Multi-stakeholder actions are strongly recommended
Strategies for medium- long-term sustainability	Strategy Selection	When highlighting the strategy of the project, a special attention to long term sustainability needs to be given. It is so requested to provide concrete action to the purpose. By highlighting the main socio-economic, cultural or institutional risks to the project, a good remediation strategy can be set up. Sustainability of the proposed action is considered an essential asset for the Italian cooperation system and will be a crucial evaluation criteria.
Project contribution to the SDGs (not only SDG7)	Overall Objective (main goal)	In order to be able to measure the impact of the Italian cooperation system when working in the energy sector a clear identification of the contribution each project may bring to SDG7 is strongly requested. In addition and in light with the multidimensional concept of sustainable development, each project should highlight the contribution provided to any other SDGs. This criteria is crucial and central to the monitoring of the action

Formulation Phase

In the formulation phase where the project needs to be structured, while drafting the Logical Framework, the budget and the Activity Plan for the project (EuropeAid Cooperation Office 2004), the items listed in Table 13 are recommended.

Table 13 – Specific criteria for the Formulation phase

Criteria 5-7	Specific step in the Formulation Phase	Description
Quality of output, outcome and impact indicators	Logical Framework of the project	Objective Verifiable Indicators need to be as SMART as possible: Specific, Measurable, Available, Relevant and Time-Bound. In the identification of the output (results), outcome (objective or purpose) and impact (overall objective) indicators, information needs to be provided in term of quantity and level of quality together with a time frame for the achievement. A comprehensive set of sound indicators is a plus for the project evaluation.
Reliability in source of verification & data collection	Logical Framework of the project	To complement indicators, the right source of verification needs to be found. Source of verification need to be accessible and available within the project time frame. The selection sources, whose reliability is consistent, is under the responsibility of the project manager and thus represents a crucial asset for the project evaluation

Budget /Business Plan Coherence	Logical Framework, Gannt Chart and Budget scheme	The coherence of the budget and business plan is also recognised to be essential if long term and successful energy strategies need to be scaled up at field level. Two are the level of coherence: Enough inputs in terms of resources need to be provided to allow achievement of results The share of the different item costs within the overall budget need to be coherent In case of productive activities a business plan is also envisage and recommended for the sustainability of the activity after the project closure.

Monitoring and Evaluation phase

In the formulation phase where the project needs to be structured, while drafting the Logical Framework, The budget and the Activity Plan for the project the items listed in Table 14 are recommended.

Table 14 – Specific criteria for the Monitoring and Evaluation phase

Criteria 8-10	Specific step in M&E Phase	Description
Expected evaluation of the project versus the 5 OECD-DAC criteria	Monitoring and Evaluation	A brief indication of Efficiency, Effectiveness, Relevance, Sustainability and Impact is requested in the project proposal. This would help the global monitoring of the Italian activity for the OECD DAC. Sustainability is also provided in other criteria.
Long term evaluation	Evaluation	When possible is strongly recommended that the project set up a strategy for keeping track of the long term evaluation of impacts even beyond the duration of the project. Involvement of local people and allocation of budget for this activity (for instance, from any induced revenues) is envisaged, but due to its high complexity, this criteria can not be applicable in all the project. For this reasons it will represent an additional added value and not an evaluation criteria.
Creation of Value at local level	Evaluation	Another added value will be represented by the creation of value at local level. This is an induced benefit of the project and may apply in some specific case. In this criteria the project manager can highlight the impact of the energy project on the other nexus related to energy from gender balance to local enterprises, from water to food and education or local empowerment.

Conclusions and final remarks

The activation of the 'Multi-stakeholder Platform for Energy in Development' represents a first national pilot experience of multi-actors collaborations, which may count on a rich and extensive framework of Italian expertise and competence, including institutional and private sectors, civil society, academic and research sectors. The overall objective of the Platform is to identify, formulate and validate intervention strategies in line with the SDG7, to promote synergic actions related to energy and sustainable development, able to combine interventions of high impact for local and autonomous development with equal promotion of Italian of culture, education, research and industrial innovation.

The document 'Guidelines for projects in Energy & Development', now close to the finalization and approval and developed through a coordinated action between the stakeholders, contributes to define a national framework for planning energy projects in the development cooperation, in relation the best practices existing in the international framework. Indeed, these guidelines would place the Italian

cooperation system at the forefront, providing a system of excellence for the identification and monitoring of the Italian interventions in the energy sector, on the one hand fully aligned with relevant international practices, and on the other by adding innovative elements in the definition of interventions and in the promotion of effective and efficient public-private relations.

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FAILING WHILE SUCCEEDING? ON THE DELICATE EFFECTS OF A YET SINCERE COOPERATION

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Abstract

(EN) Within wider criticalthoughts on and inside international cooperation, in this contribution some reflections are made about possible approaches to evaluate the effects of cooperation actions onto recipient populations. Starting from an experience of academically-led indepententcooperation in a rural internal area of El Salvador, Central America, a debate is stimulated on how international cooperation can avoid forcing the beneficiary populations, and instead really and solely serve the interests of the recipients: their strategic empowerment and – above all – their self-determination.

(ES) Dentro de reflexiónes más amplias sobre and adentro la cooperación internacional, en esta contribución se comentan una posibles estrategias de evaluación de las acciónes cooperativas sobre las poblaciónes receptoras. A partire de una experiencia de cooperación independiente guiada por subjectos academicos en una región rural interna de El Salvador, America Central, se estimula a un debate sobre cómo la cooperación internacional pueda evitar forzar las poblaciónes beneficiarias y, al contrario, servir realmente y únicamentelos interéses de las poblaciónes receptoras: su fortalecimiento estratégico y – sobre todo – su autodeterminación.

Introduction

A globalised world makes us face more and more global problems, questioning the actual boundaries between Global North and Global South, and at the same time highlighting all their interconnections. Therefore, a needed question to think about would reasonably be: who needs cooperation? and why? We propose that such dilemma is too often dodged, and too often affects the way we approach international cooperation. In this contribution, we wonder how to choose a suitable approach as well as how to evaluate the effects of our action onto the "cooperated" local communities. Starting from an ongoing experience of academically-led cooperation in an internal area of El Salvador, Central America, we aim at stimulating a debate on how international cooperation can avoid forcing, and instead really and solely serve the interests of the recipients: their strategic empowerment and – above all – their self-determination.The questions we now pose come from an experience of participatory planning in the rural community of Santa Marta, in the Salvadoran deprived district of Cabañas. This project (2014) was brought about by a small group of young researchers and professionals from the postgraduate course in Habitat, Technology, and

Development at the *Politecnico di Torino*, in partnership with the volunteering association *Psicologi nel Mondo - Torino* as well as with the local organisation *ADES – Asociacion para el Desarrollo Economico y Social - Santa Marta*, the latter acting as a local administration. This group of engineers, architects, and urban planners animated the local population toward the creation of some socio-economic guidelines. The rural community of Santa Marta, founded in the late 1980s in the chaos of the Salvadoran civil war, currently lives in conditions of environmental emergency, furthermore without running water. Anyway, they have thirst for debate and new ideas: this favourable context let us start an active process of cooperation and, at the same time, of action research, aimed at encouraging levels of empowerment so as to let self-planning and self-design happen in a near future. In the three years after the participatory planning experience we led, the first pilot projects have been implemented – some still in collaboration with external professionals, some already independently. The community of Santa Marta, administratively part of the Department of Cabañas (middle-Northern part of El Salvador) and of the municipality of Ciudad Victoria, is a rural community composed of 4,000 to 5,000 inhabitants whose traditional economy is agricultural. As shortly mentioned above, the community was founded in a re-built environment after the depopulation and destruction due to the Salvadoran civil war (1980-1992) and to the associated exile in near Honduras. Such dramatic events still produces tangible and intangible consequences in the community (cf. Mela & Chicco, 2008; Cristiano, 2014; Ciaffi &Mela, 2015; Mela & Chicco, 2016). At the same time, a sudden shift from a substince economy to the imaginary and to the different customs and traditions imported from the Global North[1] has progressively caused a social, economic, and environmental crisis, which local NGO *ADES – Asociación para el Desarrollo Económico y Social* – taking care of the international relations of the community, including cooperation projects – has recently tried to overcome through some strategic planning led with the help of participatory processes.

Our case study

In favourable circumstances where the community of Santa Marta became aware of the potentials of its own society, willing to treasure its historical memory, its social cohesion, its organisational practices, and its agricultural skills, *Politecnico di Torino*'s postgraduate course in "Habitat, Technology, and Development" decides to entrust a participatory planning project to some of its graduating professionals. Such participatory planning project was to involve local population and actors operating in Santa Marta in order to design the guidelines for a socio-economic

[1]Here mainly North America, Europe, and Japan.

organisational plan aiming at reaching systemic sustainability: environmental, economic, and social. In 2014, criticalities, needs, and potentials of the community were investigated through a participatory process (cf. Cristiano, 2014; Ciaffi & Mela, 2015; Cristiano *et al.*, 2015). The participatory approach involved meetings with the several organised groups (more or less equivalent to associations, collectives, and cooperatives), with the groups with political-administrative roles[2]as well as with the rest of the local population, even though not organised in groups. Among the employed participatory tools, focus groups, thematic meetings, outdoor workshops, and ludic-planning expedients. All these actions were meant to answer to five categories of questions, focused on the knowledge of the territory – specifically, of its problems and potentials – by *Politecnico di Torino*'s academic/volunteering professionals. Such questions – *¿Quienes son Ustedes?* (Who?), *¿Donde esta que?* (Where?), *¿Qué quieren?, ¿porqué?* (Why?), *¿Como lo logramos?* (How?), *¿Que haran?* (Who will do what?) – were not made public until the end of the process, and let the cooperation operators to recontruct a detailed picture of the local context, of its regulating dynamics, and of its important history. At the same time, the entire process let the local interlocutors familiarise with the method of representing the territory on two dimensions, required to pass from a qualitative description to the planning step. All of this led to the definition of the strategy to be adopted to favour an organisation of the territory inside and around the community that would be shared by the community members and the responsibilities towards its realisation would be distributed among the local stakeholders (i.e. th aforementioned associations, cooperatives, and collectives. The plan for Santa Marta was assigned a time horizon of 15 years, with three "intermediate deadlines" – 2020, 2025, and 2030 –to progressively face the detected problems while valorising the potentials of the community. The actions imagined through the participatory planning process are characterised by the valorisation of the community agricultural vocation, with a recovery (and the improvement) of agro-ecologic techniques as well as with the adoption of some best practices and the launch of pilot projects, at different levels: agricultural, economic, and space organisation, as described in the update presented in the next lines. Today, almost four years later, the economy of the community keeps being based upon agriculture. Some farmers have been experiencing the directions included in the guidelines towards 2030, thus reducing the use of petro-chemical fertilisers – depleting local soil and poisoning local water – and parallelly decreasing the production of solid waste and the release of wastewater – especially sewage water, where a sewage system is not present – in the local streams. An innovative

[2] Even though administratively part of the municipality of Ciudad Victoria, historical rivalries connected with the Salvadoran civil warhave caused the community not to receive funding from the municipality, and to administrate autonomously on many sectors.

cooperative has been experimenting a diversified agriculture, allowing for the delivery of fruits and vegetables that were only imported until recently. A stock for the collection and delivery of corn is currenly being built. Conversely, Local handicraft for the satisfaction of internal demand (and some local external) has not been encouraged yet. Some actions have been undertaken to maintain the historical tracks, often errouneously referred to as "touristic" (i.e. meant to bequeath the community history and the values to the next generations as well as to the rare visitors, mainly cooperation agents and scholars). The access to the community has been improved thanks to the paving of the main road to Santa Marta. After the collaboration with Italian academic and volunteering professionals for the sustainable guidelines through participatory processes, one of the pilot project designed in 2014 has already beencompleted: a learn-by-making workshop for the recovery, hybridation, and improvement of traditional building and composting technologies, flanked by an awareness-raising and training campaign on ecology and environmental hygiene. Such pilot projet has been called *Compost(h)emos*, and is illustrated in detail in the next section.

Proyecto Compost(h)emos: approach, methods, and contents

The building and learn-by-making project *Compost(h)emos* started in September 2016, mainly funded within the Italian public*8 per mille* allocations of the Italian Waldensian Evangelican Church – obtained by Turin-based association *Psicologi nel mondo- Torino* – and co-funded through some fundraising in the city of Turin in 2014 and 2015. The project represents the first implementation of the pilot projects planned in the 2014 guidelines, and was led in partnership with Salvadoran NGO *ADES* (see above), active in Santa Marta, as well as with the directorship of the educational compound of the community. Besides providing the community with a set of dry composting toilets – previously frequently used in the community, but recently abandoned – , the goal of the project is to provide environmental education. The project is articulated in three levels:

- awareness raising on the use of dry compost toilets, in order to incentivise the reuse of organic waste as fertiliser in agriculture;
- training on the tecniques of organic farmic and on the existing and traditional types of dry composting toilets – especially in rural areas of El Salvador – to raise awareness on their uses and to ensure a good maintenance of the manufact under construction;
- training on possible methods to build in *adobe*, i.e. the raw earth bricks employed to realise the manufact, with a focus on the improvement of traditional techniques recently abandoned in the community due to some solvable flaws;
- learn-by-making building-site for the self-construction of three dry composting toilets, with on-site available materials as well as the improvement of local building techniques; such

toilets are meant to satisfy a related need at the school compond "10 de Octubre", the only one inside the community of Santa Marta, where – in line with the purposes of the 2014 participatory planning project – a career in agro-ecology has been recently activated.

The inhabitants of Santa Marta were the protagonists of this project. The experience of Association *Psicologi nel Mondo - Torino* –present in this community since 2007, with interventions on psychological well-being (cf. Mela & Chicco, 2016) – the previous knowledge of the context as well as our relations, created during the participatory planning workshop, all facilitated the individuation of local persons with the required comptetences to perform some parts of the project. The training course was structure in synergy with former students with expertise in organic farming, who also actively took part in the teaching process through lectures and practical workshops. Some of them also helped with the building site, sharing their skills to make the project more efficient and sustainable in terms of both financial costs and timing.

The awareness raising campaign was favoured on the one hand by the circulation on local communication channels such as the interphone system used for internal communications to the community members, local radio station *Radio Victoria*[3](based in the near town of Victoria but mainly managed by and talking to people from Santa Marta),and local monthly magazine *Abriendo Brecha* (edited by a collective of 30-year-old community members; cf. original article inFalchetti & Cristiano, 2017), and on the other hand by the method choosen for the entire project. In fact, despite the fact that the participation in the learn-by-making building site had been planned for a limited number of students and collaborators, respectively receiving study and working grants, an on-site preliminary assessment done with the presidency of the school highlighted how the knowledge and the skills acquired through the training course and the building activities would be valuable for their participants, so actions were designed to favour the participation of a higher number of students as well as of their parents. So groups of 11 students per shift, attending the 7^{th}, 8^{th}, and 9^{th} grade, alternate themselves every working day at the building site, only those attending the 9^{th} grade (i.e. a lower number on the total students of the school, yet a much higher number compared to the initial plan) were selected for the training part, articulated in lectures and practical workshops however open to the whole community. Each group of students was accompanied by one or two instructors from the school, so as to ease the performing of the activities inside the learn-by-making building site.

The idea of also involving the parents of the students as well as to let other inhabitants (Fig.1) become an active part of the project favoured the changeover of people inside the building site (thus

[3] radiovictoriaes.org

making the building activities faster) and, above all, followed the principle according to which the participation into the realisation of a project of general interest is the best solution to ensure that the value of the project is actually perceived as such, and, as a consequence, grant its future actual use, maintenance, care, and duration in time.

If the the new organisation of the learn-by-making building site facilitated the involvement of a higher number of people, it also made its progress dependent on the availability of students, parents, and other community members, all participating on a voluntary basis. As a consequence, the project ran the risk of not being completed in time; in fact, frequent absences were registered compared to the voluntary shifts initially agreed upon; however, this eventuality had been taken into consideration since the start of the project, since a similar project, based on the involvement of community members in a peculiar context such as El Salvador, was very likely to be to a certain extent unforeseeable.

Fig.1 – A Saturday at work with groups of non-student volunteers from local associations.

The training course was structured in six days, specifically addressed to students from the 9th grade but opened to everyone in the community. All the meetings were characterised by a theoretical and a practical part – the latter mainly performed at the premises of the local group for agro-ecology and permaculture (the *Grupo del Invernadero*, i.e. the greenhouse group) and focused on the themes of

organic farming, the use of dry composting toilets, and the improvement of local building tecnique in raw earth.

A further meeting on the types of dry toilets and dry composting toilets was dedicated to the instructors and directors of the school compound, so as to ease the management and maintenance of the built structures over time, including the collection of the material required for the use of the toiltes (e.g. ash) and the distribution of the produced compost. These activities would involve the parents of the students as well as local groups and associations.

Discussion

Proyecto Compost(h)emos was carried out with the support of:

- 5 local skilled persons: a mason, a producer of *adobe* (raw-earth bricks), a person able to overlook self-construction projects using sustainable materials, two enthusiasts of organic farming;
- 23 instructors from the local school compound;
- 70 students;
- 98 parents.

Three dry composting toilets were built in Santa Marta, Cabañas, El Salvador, right outside the local school compound “10 de Octubre” (Fig.4), in order to allow at the same time for a usability by the students and instructors of the school and an opening to (and visibility for) the rest of the community. The structure was built with a hybrid frame (Fig.2) using improved non-alien technologies – *adobe*, local bamboo, and sheet metal – as well as with a ventilated roof.Parallelly, a training course for students, instructors, and community members in general was held on ecology, environmental hygiene, and subjects functional to the very learn-by-making building site.

The project lasted 14 weeks:

- the first two weeks used to organise a calendar together with the recipients as well as to lead mechanical tests on local earth samples in order to later make high-quality *adobe*;
- 10 central weeks of building activities and training course, as described above;
- 2 final weeks used for the mason to install wooden doors, to finish off the paving of the structure, and to lay the plaster.

Fig.2 – Progress of the building site at the end of the 12th week of the project (courtesy of Justin Bench).

After the completion of the project, the natural mismatch between the remote design phase and the implementation phase has led us to ask ourselves some questions. In spite of the multiple requests of the local NGO for the project to start, why do we – external operators – seem more motivated than them to realise it? What is the perception of the usefulness of this project three years after the drawing of the guidelines for a socially and environmentally sustainable self-planning in the community? Have the prorities of the inhabitans and local associations changed? Should we revalue the entire listening and co-planning work performed with the community, whose ruined attribute of passive subject in international cooperation processes we now realise, affecting the implementation of a yet shared project?

If this project was started and carried out is because the stimulus, matched with genuine interest, motivation, and passion, towards a project able to improve the conditions of a community had solid foundations. During the first experience of research and action in 2014, it was possible to verify that the very community was aware of the compromises it was accepting while importing low-price polluting chemicals to obtain a rich agricultural yield for the time being, but insane and unhelathy for its current and future ecological and even economic impacts: the local environment, the health

of the population, and – with the impoverishment of soils – for the agricultural activity itself. At that time, some farmers were already experimenting organic farming techniques, using natural fertilisers and, very few of them, were even studying fermentation systems for organic waste to be used in agriculture. We therefore started to get the impression – later become awareness – that the problem was not a lack of interests in the project nor its no longer matching the needs of the community, but rather on the fact that processes like this require human relations characterised by more proximity as well as reduced intervals between the listening and co-design phase and the implementation phase. Once the first phases of the participatory process are completed, fuelling expectations on the involved individuals, it now seems natural that the longer it takes for the actualisation of such expectations, the more the engagement of such individuals decreases. In our example, the worsening of clashes among criminal bands inside the community (the so-called *maras*), putting the community members in danger for more than one year, caused the implementation phase of project *Compost(h)emos* to be postponed. A concause for such postponement is also represented by the financial availability of the involved organisations, due to the fundraising system.Furthermore, the experiences of activation inside the community have happened on other themes so far. As previously mentioned, some environmental awareness is present in some individuals and groups, but are walking their way up the ladder very slowly. However, it was interesting to note how each participant in the project at issue took *Compost(h)emos* as an occasion to also address other issues about which he/she cared. For instance, the school director (Fig.3) took advantage of the project also to seek those "cultural change" he has always been trying to pass on his students, i.e. raisinginterest in becoming an active part of the community by reducing the appeal of the "easy life" promoted by the aforementioned criminal bands.

Fig.3 –The moment when the school director communicates the beginning of the project and explains its activities to some of his students.

The effect of the implemented process was the involvement of a high number of individuals, coming from different social extractions and showing different starting comptenences. A learning and horizontal exchange model was experimented, where we, as technical professionals, measured ourselves with local peers, being humble and seeking to get some more knowledge of their ways of doing things. This stimulated their curiosity in experimenting a building technology inspired by a deep exchange of the knowledge of each of the two parts. This way of action, starting with the listening of what the other has to offer, let discover local skilled persons not sufficiently recognised and valorised inside the community and by its leading groups nor invited to previous international projects; these people have been therefore put into relation one another and with the managing authorities, the latter used to select personnel for projects without a sufficient turnover, i.e. not basing upon competences – we cannot say whether for inertia or favouritism. This way, new relations were started, and others got strenghtened, facilitating a social integration besides working collaboration.The importance of the project, especially in terms of knowledge exchange, was recognised by the community. This can be deduced from the direct appraisal of the participation in the building activities, from the outcomes of interviews carried out at the end of the project as well as from the acknowledgement that the school directorship and faculty dedicated to us – Italian professionals – during the closing ceremony of the project, when a diploma was also awarded.

Fig.4 – Laying of the first *adobe* bricks after the completion of the basement.

Conclusion

During a field project (2014) linked to the activities of *Politecnico di Torino*'s postgraduate course in "Habitat, Technology, and Development" in the rural community of Santa Marta, El Salvador, some guidelines for a socio-economic organisational plan were co-designed through a highly inclusive participatory process; these guidelines included some pilot projects to be implemented in the following years, all characterised by elements of environmental, economic, and social sustainability. *Proyecto Compost(h)emos* is one of such pilot projects, which we also supported.

Some of our actions have helped overcome a phase of dependency cooperation culture. Prior to, many projects had faced temporary issues or created predetermined needs and/or expectations, that might not necessarily be desirable in such context. Ignoring cultural diversity risks to create a damage while being sure to provide help instead. Acting in Santa Marta, El Salvador, we realised how crucial is to create a network of interlocutors, differentiated in terms of both competencies and social extraction. The 2014 experience allowed us to relate with all the organized groups of the community (associations, collectives, and so on) and with three Salvadoran universities, in addition to our local partner. Among the positive results, an increased awareness in each involved subject as well as the setting up of a network of competencies. This led to the subsequent pilot projects planned in the guidelines, highlighting how the adopted process brought to some real listening of the needs of the whole community, and to a solid understanding of the importance of working in a system.

One year after the conclusion of *Proyecto Compost(h)emos*, we understand that something that could have facilitated the implementation phase of the project might be represented by a higher continuity in the performing of the planned actions –for the awareness raising, the training course, and the learn-by-making building site – organising and better marking each activity over a larger period than the actual 14 weeks. This might have not also allowed, but also encouraged the participation of the community members at a larger scale, thus reducing the moments when the recipients could feel like "passive" subject, and instead involving them also as authors of the project design process. In participatory processes, the figure of the operator – in this case, a cooperation operator/facilitaror besides a technician – should be serving the positive outcome of the project by making his/her competences available to it and paying attention not to overpass the boundaries of its facilitating role. In fact, overpassing that threshold might of course bring alternative implementation routescompared to those used by local administrations, associations, informal groups, and single individuals, but this would be done without assuring a paradigm shift able to favour the satisfaction of the real wants as well as the self-determination of the recipients.

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THE ROLE OF COOPERATION AMONGST CITIES, UNIVERSITIES, RESEARCH BODIES AND CIVIL SOCIETY ORGANIZATIONS ON URBAN FOOD POLICIES IN AFRICA AS INNOVATIVE ACTIONS IN THE CADRE OF THE MILAN URBAN FOOD POLICY PACT

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Abstract

Within the framework of the international debate focusing on experiences emerging from cities in the global North, this paper aims to explore urban food policies under the lens of a global South perspective, paying particular attention to African cities and taking into account the common elements they present -compared with other urban contexts and territories- but also the specificities and uniqueness of them with respect to the process of urbanization and the linkages existing amongst cities and food.

Urban food policies are powerful institutional actions, able to build more sustainable food systems of contemporary cities. These innovative policies are designed with a systemic and cross-sectoral approach, capable of acting at the intersection of different issues and fields such as water, waste, planning, health, transport, education, environment, trade, but also food and nutrition security, self-sufficiency and food sovereignty.

We will describe an overview of initiatives developed in African cities, in view of the values stemming from the New Urban Agenda and the recommended actions by the recent Milan Urban Food Policy Pact, as an inspiring and propelling opportunity for new forms of territorial partnerships which could promote new types of cooperation amongst cities, universities, research bodies and civil society organizations from global North and South.

Our research follows also the broader Italian development agenda. Under this light we will describe the mobilization of a number of institutional actors towards enhancing collaboration with the African context, drawing a geography of priorities, places and initiatives that are being activated in this field.

The paper will identify a series of cross-cutting issues (such as land tenure, climate change, urban agriculture, rural-urban migration, waste management) to create a set of interpretative geographies, comparing cases across different African perspectives (for instance, environmental and socio-cultural) to identify common grounds and regional features.

1. Introduction. The city between international cooperation and Urban Food Policies

The relationship between urban and rural areas is one of those elements affecting the long-running processes for a balanced development of urban and regional communities. Among the drivers of this relationship, food is undoubtedly the most symbolic element, were production areas are placed mainly in the rural areas and the areas of consumption in the urban contexts, involving a complex network of actors, places, flows and resources that altogether make a food system.

Throughout the world, this context is fueling a widespread debate, which has been steadily gaining momentum over the past 15 years, based on the principles of "food sovereignty" and "right to food". Civil Society Organizations (CSOs), particularly those acting in the Global South, have played a central role in the development of this debate.

The article focuses on new food policies which are emerging worldwide at the urban scale. These are innovative and voluntary actions, as they are not regulated through the competences of local governments. However, just because they are relatively independent processes, they are fully legitimated to provide local responses to issues arising from cities themselves.

Urban Food Policies also represent a new space for decentralized cooperation between cities around the world. A new urban leadership which, strengthened by locally developed initiatives, also moves ahead with an international drive, aligning several amongst the most promising institutional, research and civil society actors, organized around new political objectives for sustainability. On this basis, in the wake of the Expo 2015 in Milan, the Milan Urban Food Policy Pact (MUFPP) has emerged, which is of global relevance to these very policies.

The article's considerations will begin by approaching the theme of Urban Food Policies as a tool for food and nutrition security within the relationship between city and rural areas and as an institutional outcome of the principles of food sovereignty and the right to food. The boundaries of relevant experiences developed in Italy and the African continent will be outlined, describing selected policies from different geographic and cultural contexts, as a contribution to a broader perspective of the African spectrum.

We will then describe the essential features of decentralized cooperation and development projects on these issues that are underway, to conclude with the prospects that unfold in the transition from decentralized cooperation to Urban Food Policies.

2. Urban Food Policies

2.1 From Food Security to Food Sovereignty and the Right to Food

Achieving food security is one of the global challenges the international community has to tackle for a better present and future of humanity. Food security aims to ensuring to "all people, at all times, physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (World Food Summit, 1996).

For decades, food security has been considered as a matter of no much concern among the developed countries, it was an issue mainly for countries in the global South. Since 2008, however, as the food price crisis deepened, food security rose high on the agenda of major international summits. From the G8 summit convened in the city of L'Aquila (2009) to the G20 in France (2011), up to the G8 at Camp David (2012), food security became the subject of initiatives, strategies and action plans to limit the harmful effects of the "five years that shocked agriculture"(De Castro 2012).

Following the 2008 food crisis and the emergence of new global issues the idea of food sovereignty started to affirm within the international debate, initially introduced in contrast to the concept of food security, to later supplement it, in a critical way (Jarosz 2014; Patel 2009). From the geographical point of view, national agri-food policies have sought to reconnect production and consumption by shortening commercial networks so as to reduce price volatility. On the other hand, the administrative decentralization policies of the 1990s have produced new local public entities looking to affirm their own strategy, even in the food sector (Bini et al. 2017).

Besides food sovereignty, the other pillar of the shift in the international debate around food security has been the recognition of food as a basic human right. Analytical representations often show food in the center of the food system with the different elements radially arranged. However, if at the center of the food system, instead of food, the "Right to Food" and the citizen are placed and surrounded by the local policies contributing to the different dimensions, then in this context, the vision is changed completely. Typically, the element that contributes to building a local food policy geared towards the Right to Food is the approval of a Food Charter which recognizes the right to food of citizens through value remarks.

A Charter helps to read back, under the lens of the right to food, local public services and the existing administrative activities, which allow cities to fulfill their duty to respect and fully enforce the status of "citizen". From the operational point of view, a Food Charter guides every future food policy to enforce the right of food for its citizens (Bottiglieri 2015).

The first *Special Rapporteur of the Right to food* at the High Commission of the United Nations affirmed "the importance of local food security and local nutrition programs" (Ziegler 2004), mentioning a number of local measures necessary to achieve this purpose, such as: education on nutritional needs, school feeding programmes (canteens for all), breastfeeding, access to family gardens, nutritional surveillance of vulnerable groups. Along the same vein, its successor (De Schutter 2014) has identified the key to change at the local level, the urban and civic level in particular, stating that it is essential that cities assess their food dependencies, identify weaknesses, criticalities and strengths and, where possible, develop a range of measures to procure their own food".

2.2. The institutionalization of right to food and food sovereignty: risks and opportunities.

In the last twenty years, significant changes occurred in the institutional approaches to food security. Thanks to the emerge of the concepts of "food sovereignty" and "right to food" the political and cultural approach to food security has been advancing incorporating new elements like sustainability, equity and rights-based framework. The institutionalization of right to food and food sovereignty has taken different shapes. In particular, in the last years we have been observing an increasing number of countries giving a constitutional recognition to the right to food e food sovereignty (FAO 2011, Claeys et al. 2014).

Despite these advancements, the right to food and food sovereignty are still a relatively young approach to addressing change in food systems (Claeys et al. 2014, p. 10) and their institutionalization have not been necessarily producing significant changes in public policies as expected. Anyway, their formal recognition allowed to bring into the institutional area an alternative discourse on food security. At the same time, some scholars stressed that the 'human right to food' embodies both counter-hegemonic and hegemonic discourses. On the one hand, the recognition of food as fundamental right allows to politicize the 'problem' of hunger, "casting a critical light on the global restructuring of production and subjecting the market to the primacy of human rights" (Atasoy 2009, p. 13) . On the other hand, the 'right to food' discourse as negotiated in the form of laws, guidelines, policy framework have the risk to embed the principles into the neoliberal framework.

Regarding the issues of recognition of food sovereignty and right to food principles in the law and policy making process and their implementation through adequate public policies, two questions come to our attention. Firstly, at what extent and how, in particular for food sovereignty, its institutionalization should happen? Secondly, in the last years civil society organizations, farmers

and social movement have been advocating food sovereignty polices asking for support to smallholder farmers, boosting local and peasant-based food production for food security, rural development and alternative farming practices. These policies are aimed to support small producer who are still the vast majority of hungry people in the world (FAO 2015). At the same time, albeit smallholder farmers remains one of the most important actor of the transition, the multiple crisis affecting our food systems show the importance to adopt a broader policy framework across multiple sectors and governance levels (IPES 2016). For example being able to better incorporate the urban dimension into the food sovereignty paradigm (Yap, Fernandez-Wulff, Zucchermaglio 2017). The question is: what is the policy framework for implementing food sovereignty and right to food policy at local, national and international level? And how these level influencing each other?

Finally, it is important to consider the risk of institutionalization and formal recognition of these two principles, right to food and food sovereignty, without making a genuine shift adopting the new paradigm these principles imply. In this sense, "institutionalization" can risk to divert in "neutralization" of the transformative potential of right to food and food sovereignty. According to Claeys et al., in order to mitigate the risk of "neutralization" is important on one hand, engaging a series of social actors, creating and seizing opportunities for social change; on the other hand not to see institutionalization as an objective in and of itself (Claeys et al. 2014, p. 16). it is important continuously questioning if the institutionalization of both the right to food and food sovereignty are "the most efficient avenues for advancing these alternative regimes or whether change is best made through law, policy, institutional coordination or judicial mechanisms. And further whether it is possible and if so, how, to have a combined approach" (Claeys at all 2014, p. 15).

2. 3 Urban Food Policies as a new space for cooperation between cities and territories

Food systems are often designed to feed cities through a complex network throughout the food cycle phases consisting of production, transformation, logistics, distribution, consumption and waste management. All these elements interacting with food imply that the food system can be qualified in its whole as an urban infrastructure (Calori, Magarini 2015) at the same level as other sectors such as the social services, transport, healthcare, and waste management; these are sectors on which established policies at the local level already exist. Food generally does not fall within these areas of action, although food systems allow to intercept various urban competencies to be governed in a systematic and integrated way (Moragues, Morgan 2015).

Urban Food Policies can be put in place through the promotion of agreements between institutions, the civil society and the private sector by backing up a strong public-private partnership strategy within a single development platform (Morgan 2009). Very often, the initiative is taken over by the city's Mayor, who by nature is the community leader and not just the elected administrative manager of the city government. Similar experiences have been taken up in Europe, North America and Latin America through the Food Councils, open to represent all the actors involved in the food system: urban administrations, producers' representatives, researchers, the private sector and the civil society. A wide variety of actors is a crucial element in analyzing how to deal with the high complexity of food-based systems and outlining new food policies that can act effectively for good governance (Blay-Palmer 2012).

3. Urban food policies in Africa

3. 1 International networks

The international debate on these issues has been developing with ever greater intensity over the last 15 years through facilitating networks by the United Nations (WHO, FAO, UNDP) and a large, globally active, technical-scientific community.

The first seeds of this movement were already evident in the Agenda 21 in Rio de Janeiro in 1992, but it has been since the 2000s that from many parts of the world has emerged the need to act with actual urban policy actions (Blay-Palmer 2009). In 2001 FAO initiated the multidisciplinary initiative "Food for Cities" (FAO 2011). In 2013, the Bonn Declaration was the first convergence of mayors on the need for urban food policies. In the following year, the "Global Call for Action on City Region Food Systems" of Medellin (2014) highlighted the convergence of a key group of technical and institutional players (Forster 2015).

The most recent and important step in this ever-evolving, polycentric debate is represented by the Milan Urban Food Policy Pact (MUFPP), an international pact signed in October 2015 between cities around the world, precisely on food security issues and food planning, as was well articulated by the Action Plan annexed to it. The Pact currently counts 134 cities worldwide representing a network of urban governments and international organizations that have shared the will to carry on through institutional processes in cities and international advocacy. The MUFPP convey the idea of the richness, plurality and complexity of policies, projects and pathways affecting every city in the world, both in the global South and North, on the subject of local food policies. This know-how is

the best assumption and the basis for building decentralized cooperation paths on urban food policies.

This renewed sharing of values and practices within the MUFPP has the merit of rediscovering both the value of cities in helping to define local responses to global issues, and the contribution to the implementation of the New Agenda for Sustainable Development through the dialogue amongst cities.

The Goals for the fight against hunger (Goal 2) and that for building sustainable cities and communities (Goal 11) are just amongst the most obvious ones. However, through Urban Food Policies within the relationship between city and rural contexts, it is possible to touch upon all the 17 Goals.

3.2 African cities and Urban Food Policies

Urban Food Policy initiatives have emerged, before elsewhere, in the Global North, particularly in English-speaking contexts such as the cities of Vancouver, Toronto, New York, and Bristol where two major themes have urged urban administrations to act: to make food systems more sustainable and address urban obesity and food accessibility (Blay-Palmer 2012). From these initiatives, many others cases around the world have come to light, predominantly in Europe, able to take action on the de-intermediation from producers to consumers (Calori 2009), enriching the debate and array of experiences and acting on a multitude of themes relevant to all food systems such as waste, food accessibility, urban agriculture, and civic participation.

Malmo, Vancouver, Milan, Melbourne, Belo Horizonte, Shanghai and many other cities have put amongst the goals of their food policies the reduction of waste and the valorization of organic waste through the development of public-private partnerships. Many policies focus on food accessibility; London, Toronto, San Francisco, and New York have acted on the accessibility to healthy food. Many cities have launched urban farming initiatives and programs to support production in urban and peri-urban areas. Examples of such experiences are found in Vancouver, Toronto, Paris, Nairobi, Barcelona, Shanghai, and Dakar.

In this context, the theme of urban food policies that was primarily developed in the cities of the global North, is gradually involving an increasing number of cities in the global South. As noted by Kevin Morgan, in fact, “the most damaging effects of the new food equation are being wrought in the cities of the Global South, where the noxious interplay of poverty, hunger and climate change is most apparent”(Morgan 2015, p. 1380).

By looking at African cities through the lens of the food system, a wide-ranging scene of themes and issues is unfolded on which cities have started reflecting and working on. Of all, those emerging are urban agriculture programs developed in many cities throughout the continent (FAO 2012) to ensure an acceptable level of food security, adapt and combat climate change, efforts to ensure access to land, the management of migration from rural areas to cities, access to water for food and urban agriculture, and urban planning initiatives.

In Africa, despite the high urban growth rates and high levels of urban food insecurity, there is little analysis of food systems in their entirety able to restore the complexity of the elements that act within a city (Battersby, 2013). These gaps in knowledge are identified at the processes in secondary cities, the role of local governments, the impact of inadequate transport systems, food distribution, the impact of supermarkets in cities and the impact of food imports (Smit 2016).

In view of these shortcomings, several partial responses are emerging across the continent that could be linked to decentralized cooperation mechanisms between cities.

African cities can find solutions within the Milan Urban Food Policy Pact on the issues affecting the continent's urbanization process. The MUFPP therefore represents the international framework within which to develop further local applications that meet the needs of each regional context. The FAO, in the context of the agreement, is facilitating the Pact's dissemination and contributing to speed up its implementation in Africa through decentralized cooperation mechanisms (FAO 2016).

The 20 African signatory cities of the Pact are spread throughout the continent, including cities from English-speaking, French-speaking and Portuguese-speaking countries. In order to stimulate the dissemination and exchange of good practices, the first edition of the Milan Pact Award was launched in 2016. There were 4 African cities (out of 33 in total) that were candidates for sharing their good practices: Nairobi (urban agriculture legislation), Dakar (horticulture and healthy school meals), Lusaka (women's empowerment), Arusha (horticulture for a sustainable diet).

In September 2016, a forum was held in Dakar, Senegal, amongst the signatory cities of francophone African countries, with the objective to foster the development of a sub-regional network between these cities, with the attendance of representatives of the cities of Dakar, Abidjan, Brazzaville, Douala, N'Djamena, Niamey and Nouakchott. The debate within the forum brought forth issues concerning the African region which currently do not appear sufficiently considered in the MUFPP guidelines, in particular the economic fragility of African cities and the attention to support local production are two themes on which to develop further initiatives. During the Dakar

Forum, cities have produced a statement defining the actions of the Pact on which they intend to work on jointly. More specifically, they aim at enhancing participation for all actors in the food system (log. fram. MUFPP 2), identify improved technologies for food storage and infrastructure for the peri-urban transport (log. fram. MUFPP 28). These cities also aim to raise awareness of their citizens towards more sustainable diets, develop policies and practices to improve food distribution and food storage.

Among the cities which have adopted a food policy with a systemic approach, Johannesburg appears to be particularly interesting. On the one hand, this logistics and socio-economic hub serving the entire southern Africa, offers economic opportunities. At the same time, however, there are 1. 9 million people considered as poor, on a population of 8 million inhabitants at the metropolitan level. The city in 2013 committed to increasing the level of food security through the expansion of easy-to-access food distribution systems, using economic incentives and peri-urban agriculture programs. As part of a multilevel governance, urban and intersectoral actions have been integrated with those carried out by its own province, Gauteng, through training courses for farmers (Malan 2015).

The city of Dakar (2.4 million inhabitants) is working with micro-gardens, an urban horticulture practice for self-consumption and marketing of produce to local markets. Thanks to the support of decentralized cooperation, technical expertise and simplified hydroponics have been provided for the production of quality vegetables to approximately 7,000 people who cultivate 134 production centers, supported by 12 training centers. The local administration has included these practices in urban planning policies (Ba, Ba 2007).

Although the city of Maputo has grown rapidly, most of its green areas remain intact and protected under urban legislation. Since 1980, the Maputo City Council has established a peri-urban green belt for horticulture, equipping the area with irrigation systems. This area is being cultivated by 13,000 farmers who have land use rights and can therefore use the land in micro-credit operations within a union of 200 agricultural cooperatives, helping to improve the purchasing power of families and hence, their food security (McNordic 2016).

Access to land is a major issue for urban food policies. Horticulture can be promoted within a legislative framework which should be guaranteed by municipal governments in urban expansion plans, allowing access to credit needed for investments in the food system. Kigali has allocated 40% of its surface to urban development, protecting the remaining 15,000 hectares for agriculture on the most fertile soils. To limit hydrogeological disruption, Antananarivo has allocated free land areas to

vegetable cultivation which now involve a 43% of the urban surface, acting as a buffer zone to protect the city from flooding (FAO 2012).

Water access is one of the most important issues to ensure food security for urban citizens. This depends on the presence of wastewater treatment systems (World Bank 2012). Several cities such as Ouagadougou, Kinshasa, Nairobi, Dar es Salaam, Lilongwe, Maputo, Durban, Cape Town, and Johannesburg have acted on this issue by deploying urban masterplans for access to water and wastewater disposal, keeping separated water capture infrastructures from those intended for disposal.

The experiences described above represent some of the initiatives that African cities are working on. The MUFPP may serve as a framework within which a cooperation mechanism between cities can be activated. Acting in an integrated and systemic approach will help to rebalance the territorial dynamics between cities and their hinterlands, crushed by strong demographic growth and climate change effects across the continent.

4. Decentralized cooperation in Local Food Policies

The "decentralized" standpoint, from the geographic point of view, qualifies cooperation between municipalities or regions of countries distant from each other but close enough in terms of issues, processes and policies, allowing local authorities worldwide to be able to self-determine, with mutual support, their own local governance with the aim of promoting local autonomy and improving the living conditions of local populations (Carrino 2005).

Local authorities in the global North are working to support local authorities in developing countries to implement local policies that can meet all of their people's needs (Bottiglieri 2012). In this type of activity, actions aim to improve not only the local system of the developing country but also that of the country promoting the initiative (Mezzasalma 2008). European local authorities are enabled to engage in decentralized cooperation because such activities are set out in a regulatory framework consisting of European and national legislation. In this sense, the European Commission has developed and supported experiences and provided funding through the Directorate-General EuropeAid.

These considerations show the field of action for decentralized cooperation activities that individual cities may undertake and promote in the area of local food policies.

Up to now, numerous projects have been developed and actions promoted by different local authorities around the world, with a focus on Africa as a preferred region for this institutional drive, with various programs and projects made available on resources from local authorities and through projects funded by European funds for international cooperation. The links built amongst the cities of the global North and South could facilitate an active exchange between cities. Already, several Italian signatory cities of the MUFPP have established relations of exchange and twinning with African cities: Milan with Dakar in 1979 (Senegal) and Algiers in 2015 (Algeria); Turin with Maputo in 2015 (Mozambique), Praia in 2003 (Cape Verde), Tunis in 2015 (Tunisia) and Ouagadougou in 2003 (Burkina Faso).

A possible field of action is certainly that of local food services: school catering, catering in the care sector, food and nutrition education in schools, granting public space for sale and trade in food, assigning public spaces for the creation of urban food gardens, activities promoting local food excellence through the organization of fairs and cultural events.

As a matter of fact, connecting processes, informal dialogue or structured collaboration and exchange on specific issues and projects are already underway. It is no coincidence that cities wishing to set up an urban food strategy are in discussions with those having already embarked on a similar process. In this respect, some of the long-established initiatives should be mentioned, such as the exchange of knowledge and collaboration between the cities of Milan and Dakar on urban gardens, Turin and Louga on street food, Rome and Kigali on horticulture. Other initiatives may involve the food movements, such as the Slow Food, which are active at the interlocal and transnational level. However, all these initiatives have not been embedded so far into a wider framing setting for urban food policies. In opposition to this trend, the MUFPP signatory cities were presented by FAO a city-city cooperation mechanism that recalls the structure and approach of the decentralized cooperation as described thus far.

Urban food policies can be configured as a new and exciting field of decentralized cooperation and territorial partnership. As discussed previously, Italian cities have started to move towards explicit, grounded and structured urban food policies. For this reason, and for the differences in terms of stages in the process of urbanization and related challenges, decentralized cooperation relations between Italian cities(and those of the global North in general) and African cities can be characterized by less asymmetry than in traditional fields of intervention, where, however mutually enriching the exchange may be, the weight, in terms of urban history and accumulated experience, as well as the economic power and social conditions, is undoubtedly felt.

The recent initiatives (the MUFPP, New Urban Agenda) are expanding the number and type of actors involved in the international debate, from technical experts to politicians, enabling new players to the understanding of both problems and possible solutions. This new political space for debate could be the ground from which to draw further strength and drive for existing decentralized cooperation tools, encouraging the sharing of experiences and relationships between cities around the world. Such relations could also bolster new forms of diplomacy towards economic growth that various European countries are promoting, by activating the entire web of national mechanisms that further extend the number of stakeholders in the field: city-to-city cooperation mechanisms, city twinnings, partnerships for international projects with bilateral, triangular and multilateral partners constitute a new space where other actors can participate with conscious, balanced and proactive contributions.

Moreover, the realm of practices composing the framework of urban food policies is highly internationalized, with transnational and inter-local relations. In this regard, municipalities can act as a platform for these practices by connecting the global North and South with the extraordinary wealth of experiences and actors. The very same non-governmental organizations (NGOs) working in the global South are becoming increasingly important actors in promoting food sovereignty in their home countries. The meeting point between the NGOs and policy-makers also represent a sharing of experiences accumulated in two different areas, the first being predominately in rural areas and the second at the urban and national scale. If the development of cities is also dependent on a positive relationship between urban and rural areas, these two families of actors can help shape the strategies and policies at the metropolitan scale, which can enhance in turn territorial cohesion and sustainable city development.

5. Conclusions

Urban Food Policies require establishing forms of cooperation between actors in the food system and among cities and territories: local authorities, CSOs, universities and research bodies are playing a crucial role in the definition of the theoretical framework (food sovereignty and right to food), in the development of best practices (Local Food Networks) and in the elaboration of innovative food policies.

The institutionalization of concepts such as “food sovereignty” and “right to food” creates many opportunities, especially in terms of advocacy and legal action, but also raises concerns regarding

the risk of "diluting" these concepts in a neoliberal framework. Therefore, this process requires special care in order to preserve the transformative potential of these principles.

This remark confirms the importance of cooperation and bottom-up mobilization for allowing transformative and lasting effect of the institutionalization of the right to food: the involvement of local food and food-related actors through empowerment and territorial advocacy action is crucial in order to make the law work for the change. Participation starts outside the institution and needs to be oriented toward social changes.

Finally, Urban Food Policies also require project- and policy-oriented analytical and mapping efforts (in strict and broad terms) of territorial food systems, adopting a territorial approach that looks at metropolitan and regional areas or better, at territorial food systems. Considering Urban Food Policies as a co-operation framework makes it possible to strengthen food sovereignty actions at the local level, and make it work as a powerful force of resistance and an alternative to globalizing agro-food networks.

Many decentralized cooperation actions are already moving in the direction of strengthening local production organizations, consolidation of supply chains, and basic associative capabilities. Urban Food Policies can provide a better framework of coherence and meaning.

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KNOWLEDGE TRANSFER INTO A SYSTEM DESIGN PROCESS: THE CASE STUDY OF "S(P)EEDKITS - RAPID DEPLOYABLE KITS AS SEEDS OF SELF-RECOVERY"

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Sommario

Il contributo presenta i risultati del progetto collaborativo di ricerca S(P)EEDKITS, co-finanziato dall'Unione Europea nell'ambito del Programma Quadro FP7, per il settore Sicurezza (attività SEC-2011.4.2-3, grant agreement no. 284931). Il progetto ha coinvolto dal 2012 al 2016, quindici partner europei tra organizzazioni umanitarie, centri di ricerca, accademia e aziende private, per il rapido sviluppo di soluzioni modulari e iper-leggere, per implementare le Unità di Risposta all'Emergenza (ERU) già in uso dalle principali organizzazioni umanitarie.
L'articolo si concentra sul trasferimento delle conoscenze nel partenariato in un processo di progettazione sistemica, grazie a un approccio multidisciplinare e orizzontale. In particolare, si focalizza sulle attività svolte dal Politecnico di Milano, che è stato direttamente impegnato nella progettazione del packaging e della modularità delle nuove ERU.

Abstract

This contribution presents the case study of S(P)EEDKITS, a four-year collaborative research project co-funded within the Seventh Framework Programme, activity: Security (SEC-2011.4.2-3, grant agreement no. 284931). The project involved 15 European partners including humanitarian organizations, research centers, academia and private enterprises, for the development of rapid deployable, modular and lightweight kits toimplementthe Emergency Response Units (ERUs) already in use by humanitarian organizations for emergency response.
This article focuses on the knowledge transfer in a systemic design process, with a multidisciplinary and horizontal approach. The paper goes through in particular the activities carried out by the Politecnico di Milano, which was directly committed in the design of packaging and modularity of the ERUs.

Keywords

Knowledge Transfer, Emergency Response, Long-Term Self-Recovery, Emergency Shelter, Complex Systems Theory.

Introduction

In emergency response, humanitarian organizations (e.g. IFRC) have developed pre-packaged ERUs, ready-to-use and for different specific functions, e.g. medical care, sanitation, energy provision, with trained professionals. Against this background, benefits coming from other expertise are being increasingly recognized as an advantage for the humanitarian sector, such as the experimental innovation of material and technical aspects of shelter and logistics, as the interdisciplinarity of conceptual frameworks and support in terms of methodology and technological innovation, as the development of prototypes and pilot projects.

In this context, the project "S(P)EEDKITS: rapid deployable kits as seeds of self-recovery" was a twofold driver of innovation, pushing forward the performance of current and in-use emergency kits: on one side, the project improved existing ERUs and developed novel kits to support early emergency response of humanitarian organization by reducing drastically their deployment time, volume and weight for transportation; on the other side, the project approached the long-term recovery, designing the kits by their components rather than as closed products, to endorse the shared trend in emergency aid to stimulate as early as possible self-repair and reconstruction by the affected population.

Therefore, the novel emergency kits are *speed* in terms of transport and installation, in order to provide fast and proper solutions when a disaster occurs; at the same time, the novel emergency kits are *seed* for long-term self-recovery after disaster strikes, in a way that its components may be used in the reconstruction phase, according to the occurred needs, either by themselves and together with other components from different kits.

Moreover, the S(P)EEDKITS project was unique in its consortium members, closely pertinent with the project's goals. The partnership included actors from humanitarian sector, industry and research. In particular, the peculiarity of every stakeholder was:

1. Humanitarian organizations: expertise of humanitarian operation execution and management (deployment of humanitarian actions).
2. Academia and Research centres: expertise on innovative systems (materials, structures, recycling) to be tested.
3. Private enterprises: production facilities and technical competencies for the development, testing and prototyping of the kits.

Indeed, the multidisciplinary nature of the partnership assured a mutual contribution by balancing each other operational limits. Humanitarian organizations have operative knowledge but they refer

to donors; academia has theoretical knowledge that needs to be validated in the field; private sector is a technology provider that can be limited by market demand.

S(P)EEDKITS: Rapid Deployable Kits as Seeds of Self-Recovery

The complex management due to the technical and formal complexity of the project and, indeed, the nature of the partnership, having actors that had no formal experience in the emergency field, required the set up of a knowledge transfer process at two levels (see Image 1).

On one level, a quality management process was necessary in order to tackle the development of novel emergency solutions, able to speed-up the response of humanitarian organisations (NGOs) during the days following a disaster.This type of information needed a vertical organization in which the boundary conditions had been set in relation to the kits' requirements by the humanitarian organizations. On the other level, the knowledge transfer process was related to the achievement of better coordination and common technical specifications between shelter sector and the other related sectors, such as facilities (water, sanitation and hygiene, communication center) and infrastructure (medical, energy, re-building). This kind of sharing criteria benefited from a horizontal organization of the process.

The Politecnico di Milano was responsible for the latter by providing the packaging guidelines that have played a crucial role for the implementation of the project.The complexity and diversity of kits' size, use, and time of entry in the emergency scenario have been being approached embracing a systemic design, that allowed to map complexities and to enable a functioning exchange of knowledge among partners. In reality, the packaging design was instrumental to transfer knowledge transversally, by virtue of its multidisciplinary impacts: it supported the development of systemic and cohesive kit solutions, that had to be transformational or composed by modular elements.

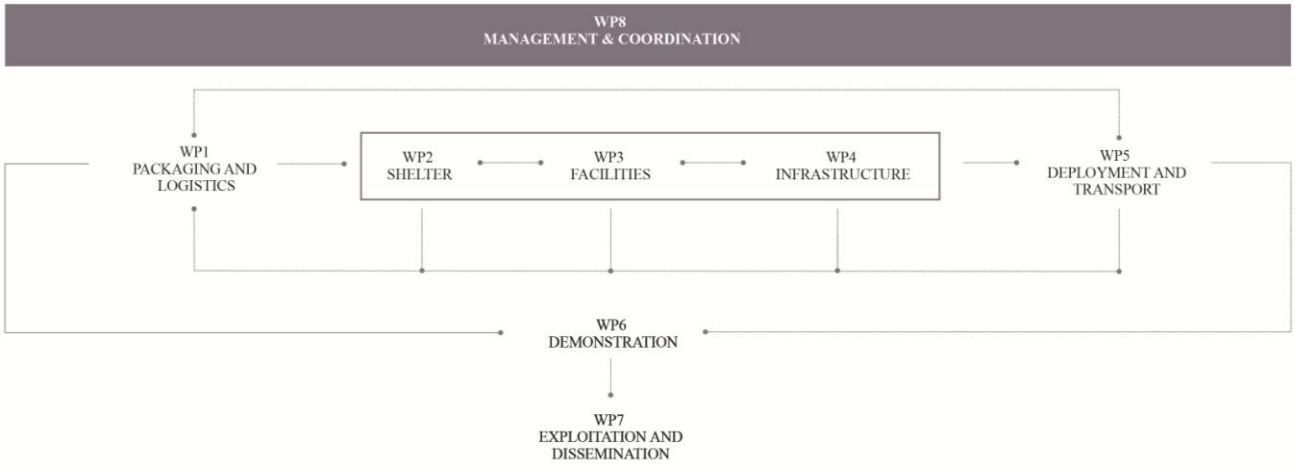
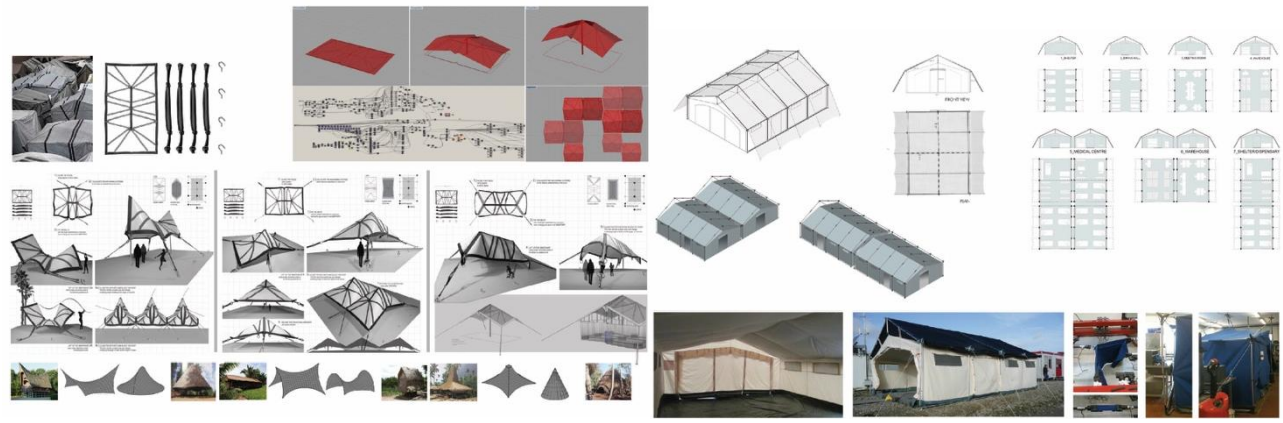


Image 1 –The two levels of the knowledge transfer process: a) the vertical process: Management & Coordination (WP8) / System Design (WP1) / Deployment & Tracking (WP5) / Demonstration

(WP6) / Dissemination (WP7); b)the horizontal process: System Design (WP1) / Shelters (WP2) / Facilities (WP3) / Infrastructures (WP4) / Deployment & Tracking (WP5).

Referring to the operational structure, the outputs of S(P)EEDKITS had being divided into 5 technical Work Packages (WPs) in the following four domains:

1. Shelter (WP2), whose aim was the design and development of novel shelter kits for four different basic shelters: ultralight weight safe house unit; collective unit; the Family Modular Unit (Cocoon);the Multipurpose Collective (Image 2).
2. Water and Sanitation (WP3), whose aim was the research, development and testing of prototypes of flexible sanitation systems, based on the use of "add-ons" for tuning to local needs and future applications.
3. Sustainable infrastructure (WP4), whose aim was the implementation of existing prototypes of container-based command, communication and medical center units; the design and testing of a biogas system for energy working with faecal and household kitchen waste; the development of mobile debris recycling kit for producing usable building materials from debris.
4. Deployment and Tracking (WP5), whose aim was the development of a decision support tool and a tracking system to determine immediately which kits and support has to be deployed.



a) b)

c d)

Image 2 – The outcomes (kits) of the "Work Package 2: Shelter (WP2)"developed by the Politecnico di Milano: a) the concept of Clever Roof; b) the tested Multipurpose Collective Unit (in collaboration with Ferrino S.p.A); c) the tested Family Modular Unit (Cocoon); d) the tested Textile Wall.

Other 4 Work Packages had been set up to work transversally to the technical WPs reported above, in order to define a common language and manage a complementary direction of development: System Design: Modularity and Packaging (WP1)**,** Demonstration (WP6), Dissemination (WP7) and Management and Coordination (WP8). In particular, the System Design: Modularity and Packaging (WP1), led by the Politecnico di Milano, tackled the (re-) design of existing and novel emergency response kits packaging, with a focus on easy and quick deployment.

As stated, the development of the packaging developed by the System Design (WP1) was planned to begin very early in the project, because it was necessary to integrate functionalities and instructions according to different emergency, climatic and cultural contexts and alternative means of transport. This allowed the process to run in parallel to the kits' development and it has been instrumental to the definition of requirements and constraints for the kits' developers. The fact that packaging, did not come as an afterthought, made the process collaborative.

More specifically, these information had been crucial for at least three reasons: i) to improve cross-collaboration alongside the WPs to define new kits, once considering the kits self-contained (speed), once studying their pack as a sub-system itself, which will be able to do an extra-function useful throughout the whole emergency process (seed); ii) to gradually focus the *architecture* of the S(P)EEDKIT system, with the aim to define the hierarchy between kits, sub-kits, pack with extra-functionality and so on, getting as much as possible the optimization of their transportability, based on a *matryoshka concept* (see Image 3); iii) to communicate the S(P)EEDKIT process in a systemic

way, as an organic complex of well-designed sub-systems, getting a map of possible interconnection between different kits.

The following table (Table 1) is an example of the coordination activity conducted by the System Design: Modularity and Packaging(WP1)along the implementation of the kits' production.

Working package	**Kit**	**Packing level**	**SC / EP***	**WP1 collaboration***
WP2	T1 – CLEVER ROOF	bag	EP	guidelines
WP2	T2– MULTIPURPOSE UNIT	bag/tank	EP	strong collaboration
WP2	T3 – PROGRESSIVE HOUSE	bag/tank	SC	strong collaboration
WP2	T4 – WAREHOUSE	Pallet	EP	guidelines
WP3 sanitation	RAISED LATRINES	Pallet	-	guidelines
WP3 sanitation	MULTIPURPOSE TOILET	Pallet	-	guidelines
WP3 sanitation	DESLUDGING KIT	-	-	guidelines
WP3 sanitation	SLUDGE TREATMENT (pasteurization kit)	Container	SC	guidelines
WP3 water	WATER TANK	bag/tank	SC	guidelines
WP3 water	WATER TOWER	Container	EP	guidelines
WP3 water	SEMI-MANUAL DRILLING KIT	Pallet	EC	guidelines
WP3 water	SITING KIT	-	-	guidelines
WP4 medical	Autonomous rapid deployment hospital	Container	SC	guidelines
WP4 medical	COORD/COMMAND CENTER	Container	SC	strong collaboration
WP4 medical	TRAVELLING SURGICAL UNIT	Container	SC	strong collaboration

WP4 medical	TRAVELLING SURGICAL UNIT	Container	SC		strong collaboration
WP4 medical	MATERNITY UNIT	Container	SC		strong collaboration
WP4 medical	X-RAY UNIT	Container	SC		strong collaboration
WP4 energy	SOLAR / PV KIT	Pallet /bag	EP		guidelines
WP4 recycling	MOBILE RECYCLING KIT	Container		SC	guidelines

Table 1 – Overview of all kits developed by different WPs and the role of WP1design group.
Legend:
* "SC/EP" = Self-Contained or with Extra-Pack
* "WP1 collaboration": "Strong collaboration" = The Politecnico had been part of the design team since the very beginning) / "Guidelines" = The Politecnico had been developed the general guidelines for the packaging design and the writing of the instruction manual of each kit.

Basic Packaging Design Principles for Emergency Response kits

As a matter of fact, the promptness of the post-emergency response is fundamental. Nevertheless, it is also stressed out that, from the logistics point of view, not every kit is needed in the same phase: indeed, most of the kits must be available as soon as possible (i.e. the communication center, the shelter kits), but others could arrive after few days (i.e. the recycling kits).

The second relevant innovation pursued by the S(P)EEDKITS project was to overcome the different technical specifications and logistics divisions between NGOs, introducing a new packaging model that can be flexible to the different kits' specifications thanks to a system design approach.

A preliminary analysis between different emergency phases was needed in order to plan and send efficiently the different ERUs, according to a modular packaging design. Several researches had been done on the existing disaster phasing methodologies: general theories were compared to the operational methods practiced by some important international humanitarian organizations(namely, ECHO, OCHA and International Federation of Red Cross). In the following table (Table 2), the results of that *knowledge matrix* reports the slight, but consistent distinctions that emerged between the methods:

	Analysis			Proposal
Emergency management	**EU/ECHO**	**UN/OCHA**	**Red Cross Luxemburg**	**S(P)EEDKITS**
Emergency management cycle	**LRRD approach**			
Mitigation	-	-	-	-
Preparedness	-	'Imminent danger'	-	-
Response	Relief	Response: first 48 hours	Relief:	Rescue (first 48h<time)
		Response: from 48 hours till recovery phase		Relief (48h<time<2/4weeks)
Recovery	Rehabilitation	Rehabilitation and reconstruction	Recovery	Recovery (time>2/4 weeks)
	Development		Reconstruction	Reconstruction

Table 2 – Phasing of emergency situations (elaboration of the authors).

The *knowledge matrix* of the State of the Art was a fundamental starting point to define the packaging and the modularity between the different production kits – i.e. T1: Clever Roof, T2: Multipurpose Unit (see Tab.1) –. Indeed, the *time of delivery* and the *means of transport* influence strongly the design principles of every kit, which should be different according to the specific post-disaster phase.

In the operational framework of the project thus, the disaster's management phases had been distinguished in four overlapping stages:

I) the RESCUE, meaning the first 48 hours after the disaster;
II) the RELIEF, after 48 hours;
III) the RECOVERY, within the first 2/4 weeks after the disaster occurred;
IV) the RECONSTRUCTION phase.

As mentioned, the innovative contribution of S(P)EEDKITS to the emergency sector was to design the most flexible and adaptable solutions, so that the affected population will use them during the reconstruction phase. The re-usability of some components of the kits was planned from the very beginning relief phase to the reconstruction phase in which they could become useful building elements. In order to accomplish to this challenging objective, the packaging design was the selected

source of information exchange and monitoring mounting strategies along the different emergency phases and kits.

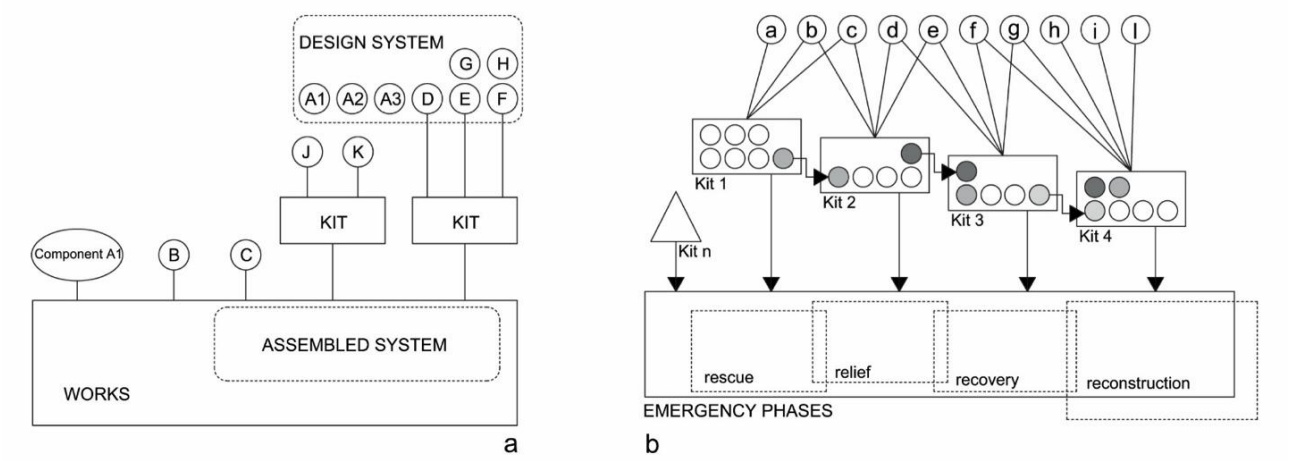


Image3 –The relation between the two following approaches: a) the design system and kit in the Building Sector (Construction Products Directive – 89/106/EEC); b) the system design and the *seed concept* adopted in the S(P)EEDKITS project (elaboration of the authors).

In this sense, the S(P)EEDKITS had worked like a design system(Image 3), based on which all the ERU kits have been developed; each new kit could also be different and adaptable, targeted for a specific emergency phase (meaning different functional/social requirements), based on the best practices, and at the same time the kits needed to act as system, taking into account that the design system allows: i) different combinations of components in customized kits (for their adaptability to different climatic contexts; different cultures; means of transportation); ii) the re-usability of some components of the kit in the subsequent emergency phases as a component of the next kit, which are later delivered.

Modularity and Designing Components: a Systemic Approach

In the specific field of humanitarian first repair and reconstruction, the traditional modular approach may not solve problems that characterized the emergency context, i.e. transitional requirements, and, in some cases, might strongly affect the development and reconstruction phases of a community which may not be able to return to its original condition on his own.

Even if modularity has always been identified as the fundamental principle on which every solution, that aims to fulfill rapidity and efficiency, should be based on, the growing number of humanitarian cases need to take into account potentialities of much more effective alternatives. That is the case of solutions which could perform an implementable and flexible system in contrast with the rigidity

and standardization offered by modular-based concepts. As a matter of fact, advantages of modular design are relevant in the design and planning phases where they can be easily arranged or modified according to spatial necessities – shipment, logistics and local transport of building components – but, in construction phases, modular design reveals its limits. On site, local resources and contingency may give precious inputs and may offer even better solutions to the community: therefore, adaptively and compatibility –meaning an "open building model" (Habraken, 1985)– would allow more freedom to set up the best configuration as soon as the boundary conditions become clearer or by adapting to them if anything changes.

The novelty of the S(P)EEDKITS approach had been to design the kits by their components rather than designing them as products, i.e. prefabricated shelters, and to consider the kits as a coherent *unicum*, as a complete set of parts and components that could/should work together as a system.

The main challenge was to determine those special *constant* properties that made the kits being developed in the whole project, reciprocally harmonious and understandable for all users throughout the emergency process. And, going further, to coordinate the design of some components in order to allow them to be reused.

Definition of the knowledge transfer process

Therefore, the main actions of the System Design: Modularity and Packaging (WP1), led by the Politecnico di Milano, had being been:

1. *Setting a common language for all partners, in particular about the definition of the emergency phases and the means of transport.* A widely accepted phasing method was firstly assessed, to define the emergency phases. Each humanitarian organization uses a different disaster phasing methodology. In S(P)EEDKITS, the phasing method of the Red Cross Luxembourg was adopted, combined with the one of OCHA. According to this methodology the "response phase" was divided into two different parts: rescue and relief. Hereby, a distinction was made between the emergency kits and relief kits: most of the kits must have been available as soon as possible, (i.e. life saving and communication infrastructure, although some kits could arrive after a few days (i.e. some shelter kits) or even weeks (e.g. recycling kits).
2. *Understanding the partners' needs for the packaging of each kit.* After a qualitative data collection referring to the needs of different partners, the outputs of each Work Package was set. An assessment of the various kits and packaging concepts was then conducted to eva-

luate them (e.g. needs of kits' developers and advices in further developments of guidelines).

3. *Supporting each partner in the design and setting up of the development of its kits.* A process of cross-collaboration was set up alongside the WPs' production, meaning the Shelter (WP2), Water and Sanitation(WP3),Sustainable Infrastructure(WP4), to develop new packaging kits (e.g. considering the kits self-contained, or studying their pack as a subsystem itself.).
4. *Coordinating the other WPs' kits by defining common design specifications and requirements.* In an effort to bring together different, complex, requirements and needs emerging from the project partners and groups developing the various kits, a set of constraints and guidelines was set up to define basic packaging design principles. In particular, the packaging guidelines focused on three main areas: i) the characteristics of the kits that have to be delivered (i.e. size, weight, contents); ii) the time at which they have to be delivered after the emergency strikes; iii) the best and most appropriate means of transport to be used.

The researches and activities of the System Design: Modularity and Packaging (WP1)can be summarized as follows:

- *The analysis of the State of the Art.* Understanding transport and packaging requirements relating to different kits. The starting point was to collect data and achieve knowledge about the State of the Art (SoA) of existing materials and equipment, used by the humanitarian organizations. Hence, the project had inherited experiences and best practices from humanitarian sector as a premise for implementing the existing emergency response. Those had been critically reviewed from both the material and building construction point of view and a matrix had been developed.
- *Development of modules.* Following this preliminary analysis work, a *matrix* was elaborated outlining the various means of transport and the different levels of packaging (container, pallet, bag) most commonly used that led to modularity and the maximum size of packaging.
- *Development of guidelines*. Guidelines were than developed defining packaging levels with specific dimensions and materials (modular nesting concept), labeling and marking, color coding, packaging and logistic strategies suggestions, manual and instructions framework and guidelines, wiki documentation and online support portal, and suggestions for the integration of packaging with instructions.

- *Monitoring and interaction*. The advancement status of each WP has been monitored from initial requirements definition and concepts till the final product to obtain relevant information and to offer advice to further the development of the concepts.

  A *reference table* of all kits was created, containing all information about the issues of packaging, transporting and deployment of the kits.

*Introducing different kit usability for the same component and multiple users for the same kit.*Approaching the design of innovative packaging for emergency response, the user-centred design is fundamental: *personas* (core users) were introduced to partners as a design tool useful to influence development decisions to make them relevant to different context and users.

Guidelines: packaging and instructions

The purpose of S(P)EEDKITS was to provide kits that can be pre-positioned and transported very quickly and easily, that are modular and adaptable, low cost, high-tech in their conception but low-tech in use. The research focused on the design of optimized strategies targeted at reducing the dimension, managing modular composition of items (based on euro-pallet dimensions) and minimizing voids. To respond to this requirement, a *Modular Nesting Concept*(Image 4) was conceived for the packaging: elements were designed in order to fit different capacities of transport and to combine on any level, whether it is a bag, a pallet or a container.

Partners (kit developers) were provided with guidelines about the reduction of weight and dimensions of the packaging, keeping the maximum kit size fitting on euro-pallet or sub-modules of it and, whenever possible, packaged in bags made of durable technical textiles.

The guidelines were completed with a framework for assembly instructions and manuals, as well as with standardized transport/package labels and color coding(Image 5).

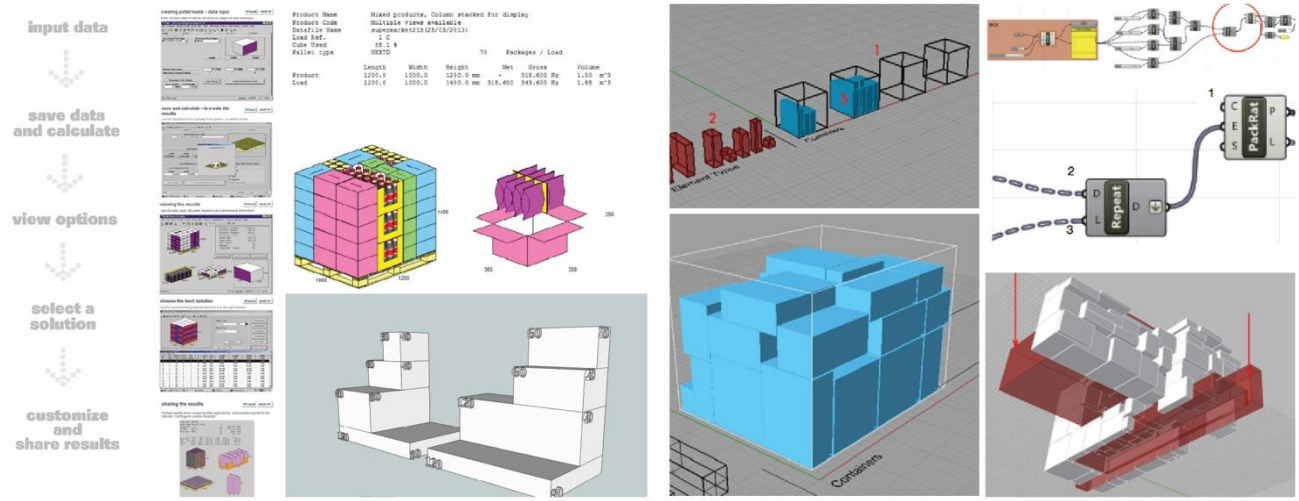


Image 4 – The Modular Nesting Concept.

Image 5 – The packaging guidelines provided mounting instructions and tracking system; they were labeled with different colors according to the kit type. The photos show the field mounting test of the T1 – Clever Roof and T3 – Cocoon, in Senegal.

Conclusions and further findings

The article illustrates a case study on a research conducted in the field of emergency response for the development of rapid deployable, modular and lightweight kits. The activities have been conducted within a multidisciplinary partnership with diverse actors.

The contribution focuses on the role of the System Design: Modularity and Packaging (WP1), led by the Politecnico di Milano, in the effort of exemplifying and explaining an effective and useful method to transfer knowledge and make sense of multiple developments with a complex system. What emerged from the process was that by enforcing and enabling a trans/multi-disciplinary approach to design, by being able to interact and include different users and needs in the development of the packaging and its guidelines, the S(P)EEDKITS project have made an advancement toward a systematization of the work conducted in parallel by different teams. Beyond implementing a systemic design approach, the project defined a number of constraints and guidelines that were needed to be able to maximize compatibility of kits, components and packaging:

- the set up of constant properties or elements (e.g. size, weight, content);
- the set up of standard capacity transport (e.g. euro-container and, as sub-systems, euro-pallet and bag;
- the set up of a widely accepted phasing method, according to the different phasing methodologies in use by the humanitarian organizations;
- the drafting of standard guidelines for the packaging of the emergency kits;
- the drafting of a framework for instructions and assembly manuals in order to harmonize and simplify the process to different users.

The broader vision that the System Design: Modularity and Packaging (WP1) have tried to coordinate, through the packaging and logistics, was to create singular items that, each associated with one kit, will work both alone or associated with other kits. The *multiplicity* of the packaging was the characteristic to allow the kits to be used in different ways, after they have satisfied their primary function of transporting the goods to destination. In this way, different structures can be created, with different functions, and finally multiple *seeds* can be generated, that could be open to local adaptation in emergency response. In this context, the knowledge transfer process between partners was essential to define the *constant* properties across the all kits, and it has been enabled within the development of the project by the activities of System Design: Modularity and Packaging (WP1).

Nevertheless, more multidisciplinary research and fieldwork, transversal to diverse expertise and scientific knowledge, is required to develop a deeper awareness on the value and methods of knowledge transfer, among actors attaining at different sectors or institutions, to improve emergency response effectiveness.

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NOMENCLATURE

ERU	Emergency Response Unit
WP	Working Package
NGO	Non Governative Organizations

KNOWLEDGE TRANSFER AND CAPACITY BUILDING: AN EXAMPLE FROM THE URBAN WATER SECTOR

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Abstract

Rural-to-urban migration and sustained natural population growth in Africa, if not properly addressed, may pose serious threat to ecosystems and human wellbeing, both locally and afar. Novel concepts and operative approaches are needed to better frame these challenges and support local decision-making processes, to promote sustainable development. Indeed, this is a key area in which the Academia can make a significant contribution, for example, exploring innovative concepts and developing related approaches to support decision-making processes at a local scale. This paper focuses on the urban water sector as an informative example, ultimately aiming to highlight key areas in which research can provide concrete and valuable assistance. More specifically, we introduce two innovative concepts, i.e. ecosystem services and boundary work; hence propose an operative approach to support the process of design and assessment of the impact of watershed investments. To illustrate real-life implementation of the approach in a data scarce context in sub-Saharan Africa, we consider as a case study soil erosion and water scarcity-related challenges affecting Asmara, a medium-sized city in Eritrea. Accordingly, we adopt urban water security and rural poverty alleviation as two illustrative objectives, within a ten-year planning horizon. The case study application resulted in spatially explicit outputs that inform decision-making processes. By timely addressing stakeholders' concerns of credibility, saliency, and legitimacy, the proposed approach is expected to facilitate negotiation of objectives, definition of scenarios, and assessment of alternative watershed investments. Above all, and beyond the urban water sector, the case study application helps highlighting key areas in which the academic work can make concrete contribution mainly in terms of knowledge transfer and capacity building.

Keywords

Ecosystem services, urban water sector, boundary work

Introduction

By 2030, Asia and Africa will host 90% of the additional 2.5 billion urban dwellers of the planet. In Africa alone, due to sustained natural population growth and rural-to-urban migration, the urban population is expected to more than double in the next two decades. This is an unprecedented opportunity for improving the living conditions of the people and, generally, for development in the continent. However, rapid urbanization and related land-use changes, if not properly addressed, can also pose serious threats to ecosystems and human wellbeing, both locally and afar. In worst-case scenarios, ungoverned urbanization has the potential to trigger conflict between communities, further exacerbate existing conditions of poverty and inequities, eventually, fueling ongoing migratory phenomena. Therefore, it is of utmost importance that current rapid urbanization in Africa is conceived within a framework of sustainable development, i.e. development that aims to meet human needs, while protecting life-supporting ecosystems. To this end, as part of international cooperation, academic endeavor has indeed a key role to play in exploring innovative concepts to frame the challenges, and in translating them into operative approaches to support policy, and decision-making at different levels.

Ecosystem service is a concept that prefigures a novel mode of conceiving the relationship between human and natural systems. This vision, promoted by institutions such as the United Nations and the European Community, is characterized by an unprecedented attention towards a proper assessment of the contribution to human well-being offered by ecosystems. An ecosystem, a portion of the biosphere, consists of living and non-living components that interact as complex dynamic systems, of which humans are an integral part (MA 2005), and ecosystem services are the direct and indirect contributions of ecosystems to human wellbeing (TEEB 2010).Increasingly, the concept of ecosystem services is used as knowledge base and as a tool to enhance decision-making relating to natural resource management, conservation planning, and water resources management (see for example Abson et al., 2014; de Groot et al., 2010; Geneletti, 2015; Maes et al., 2012).

Boundary work is a concept originally introduced to understand efforts to distinguish between "science" from "non-science" (Gieryn 1983). Recently, however, the concept has evolved, and been reframed to address an active management of the tension that arises at the interface between user and producers of knowledge (Cash et al. 2003, Clark et al. 2016). Boundary work is now defined as any effort put in place by any organization (or individual) that seeks to mediate between knowledge and action. Clark et al., (2016) well illustrates the theoretical background of boundary work, including the definition criteria (i.e. credibility, saliency, and legitimacy), attributes (i.e. participation, accountability,

and boundary objects), and functions (i.e. communication, translation, and mediation) of boundary work that determine the likelihood of a successful transfer of knowledge to action. Most interestingly, the Cark and colleagues highlight two aspects that are crucial for identifying potential barriers to knowledge transfer, hence, for defining the most appropriate boundary work strategies: "what is knowledge used for" and "how the user perceive its source", respectively. In terms of use, knowledge can be used for enlightenment, decision-support or negotiation-support. In terms of source, users can perceive knowledge as their personal expertise, as coming from either a single community of expertise, or multiple communities of expertise. These are indeed crucial aspects to account for in order to facilitate transfer of knowledge into action. (For more on this see Adem Esmail et al., 2017; Adem Esmail and Geneletti, 2017).

Through a case study approach, we here explore how the above-mentioned concepts of ecosystem services and boundary work could be applied in an operational setting to inform decision-making in the urban water sector. Specifically, we develop and test an operational approach to support decision-making processes in a medium sized city in sub-Saharan Africa. We focus on the urban water sector mainly because it offers interesting insight into the challenges facing many cities in the Global South, including the need of substantial investments to build physical infrastructures and develop human capital, while restore degraded ecosystems. However, our ultimate aim is to highlight some aspects in which academic endeavor can make concrete contribution to international cooperation projects, mainly in terms of knowledge transfer and capacity building.

The Case Study: Toker Watershed in Eritrea

Eritrea is a small country in Eastern Africa with a population less than six and half million. It is a prevalently rural country, almost 77 percent of the population, yet is currently undergoing rapid urbanization. During 1984-2010, its urban population had grown from 800.000 to 1.200.000, of which 37 percent took place in the capital, Asmara. With around 650 thousand inhabitants, Asmara accounts roughly for 10 percent of the total population in Eritrea. Since 1996, Eritrea got its independence in 1993; the country is divided in six administrative regions based on the main watersheds (See Figure 1). The case study area is located in the smallest and most densely inhabited region, the Central Region (i.e. "Zoba Maekel"), covering less than 1.2% of the total area yet hosting almost 17% of the total population. In this context, the focus was on the Toker watershed and its homonymous reservoir, built in the year 2000 for water supply to Asmara and its surrounding areas.

Soil erosion-, and water scarcity-related problems emerge among the most critical issues requiring urgent solutions in our case study. Soil erosion is caused by a long history of poor cultivation and overgrazing, unregulated wood and timber harvesting, lack of recycling of nutrients and poor management of organic matter, as well as rapid urbanization and demographic growth (Murtaza 1998, Tewolde and Cabral 2011). Water scarcity is mainly due persistent droughts associated with climate variability and change (Abraham et al. 2009; MoLWE 2012; IPCC 2014). Overtime, to face physical water scarcity, several reservoirs had been built to store surface water, during two wet seasons known as "kiremti" (June-September) and "asmera" (March-April). These reservoirs were the main sources of water for meeting urban and rural demands, including irrigation, livestock watering, domestic water supply, and other uses. Yet, soil erosion was rapidly decreasing their storage capacity, further compounding physical water scarcity in the region with economic water scarcity (Abraham et al. 2009).

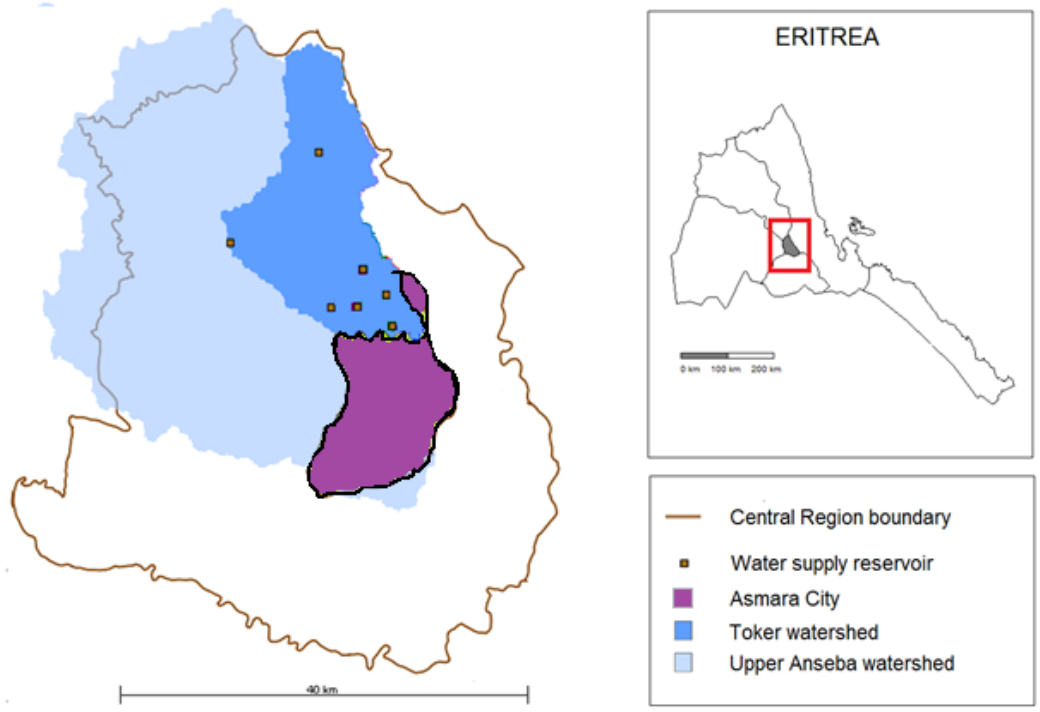

Figure 1: The Toker watershed, a sub-watershed of the Upper Anseba located in the Central Region, and the seven reservoirs that supply water to Asmara (right). The six administrative regions in Eritrea based on the main watersheds; the Central Region, the smallest and most densely inhabited in the country (left).

An illustrative example of how the ecosystem service concept can be useful for effectively framing the socio-ecological challenges in the case study is shown in Figure 2. Among others, it highlights the differentiated impacts different groups of people (Daw et al. 2011). On the one hand, soil erosion causes a rapid loss of storage capacity of reservoirs supplying the city of Asmara: according to Abraham et al (2009), the estimated average sediment yields in the region is of 856 t/Km^2, which corresponds to an annual storage capacity loss between 0.5 and 2 percent (Abraham et al. 2009). On the other, soil erosion affects livelihood of rural communities by resulting in lower yields: the Food and Agriculture Organization (Fao) has estimated that a rate of soil erosion of 1500 t/Km^2 per year could reduce yields by 0.2-0.4% a year for crops and 0.05-0.1% for livestock (Fao 1994, as cited in (Habtetsion and Tsighe 2007). As far as water scarcity is concerned, the total number of reservoirs in the Upper Anseba Watershed is 49, of which the 11 biggest ones (7 in the Toker watershed) supply water to Asmara, and 38 smaller reservoirs serve rural communities for drinking and irrigation purposes (Abraham et al. 2009). The aggregated storage capacity of the 49 reservoirs is 32 million cubic meters, of which 24.8 million m^3 (77.4%) is reserved for Asmara. Nevertheless, Abraham et al (2009) have estimated that, due to siltation, only 55-89% of that storage capacity is still available. Therefore, soil erosion and water scarcity hinder the city of Asmara from meeting its growing water demands at the same time seriously jeopardize the main sources of income of the rural communities, whose livelihood depends primarily on rainfed agriculture. For this reason, in this case study exercise, the two illustrative objectives considered for investment in the Toker watershed are Urban Water Security and Rural Poverty alleviation.

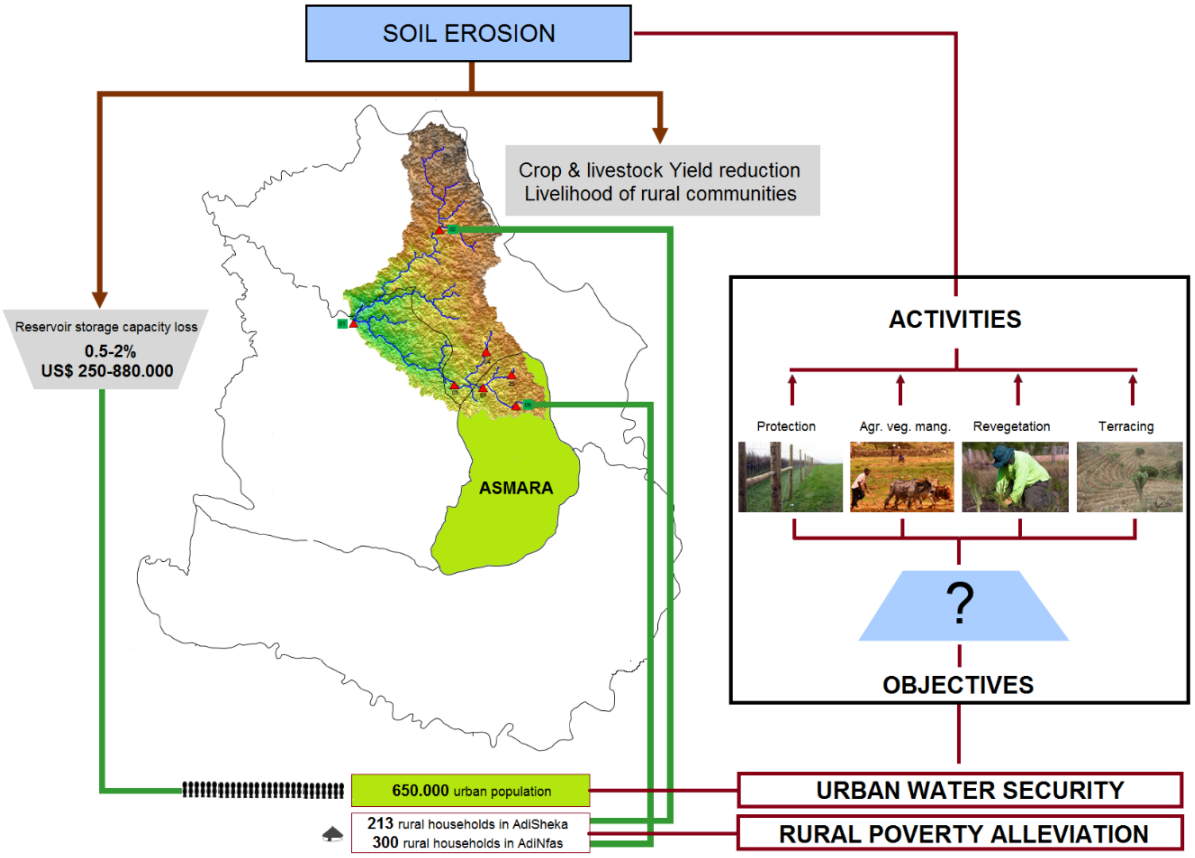

Figure 2: Framing of soil erosion-related challenges in the Toker watershed from an ecosystem services' perspective, highlight of (i) the spatial mismatch between areas of ecosystem services production and benefit, (ii) the different impacts on urban and rural beneficiaries, and (iii) the two illustrative watershed investment objectives in the case study application. Four types of activities covered by watershed investment, namely, protection, agricultural vegetation management, assisted revegetation and terracing.

Watershed investment: A tool to promote sustainable urbanization

Securing water is a pressing challenge facing many cities around the globe (Richter et al. 2013). Watershed investments to secure water for cities represent in fact a promising opportunity to effect large-scale transformative change that promotes human wellbeing while conserving ecosystems (McDonald and Shemie 2014; Guerry et al. 2015). According to an in-depth analysis of watersheds supplying five hundred cities worldwide, 25% of the cities would gain a positive return from watershed investments, with annual saving on water treatment costs exceeding US$ 890 million (McDonald and Shemie 2014). Watershed investments consist of governance and financial mechanisms that secure

clean water for downstream users, mainly cities, and operate by engaging primarily upstream communities and nature conservation organizations (Higgins and Zimmerling 2013). They can target a wide range of activities, from changes in land use and alteration of vegetative covers, to education, and community outreach; and so enhance selected ecosystem services such as erosion control and nutrient retention, while conserving nature and biodiversity. Watershed investments may also have explicit social objectives such as poverty alleviation, which comprises both poverty reduction, and prevention (Daw et al. 2011). However, designing and assessing watershed investments can be challenging because it has to deal with barriers and boundary work concerns that are similar to the ones analyzed in the previous chapter. Thus, the need of adequate approaches for supporting their implementation, by duly addressing the concerns of different stakeholders. This includes taking into account both contextual (i.e. relatively stable) and contingent (i.e. relatively changeable) factors as well as the relative influence of stakeholders.

An operational approach supporting the process of designing watershed investments

Here, we propose an operational approach to support a process of design and assessment of the impact of watershed investments (see Figure 3). Based on consideration of the concepts of ecosystem service and boundary work, the approach is structured to facilitate negotiations among key water sector stakeholders, in terms of setting the agenda; defining investment scenarios; and assessing the performance of watershed investments and finally planning for a follow-up. On a more technical side, the approach covers data processing, tailoring spatially explicit ecosystem service models, hence their application to design a set of "investment portfolios", generate future land use scenarios, and model impacts on selected ecosystem services. Interesting is the emphasis on the differing boundary work needs of different stakeholders (e.g. policy makers, farmers), at various stages of the process. Details on the approach and rationale behind it can be found in Adem Esmail and Geneletti, 2017.

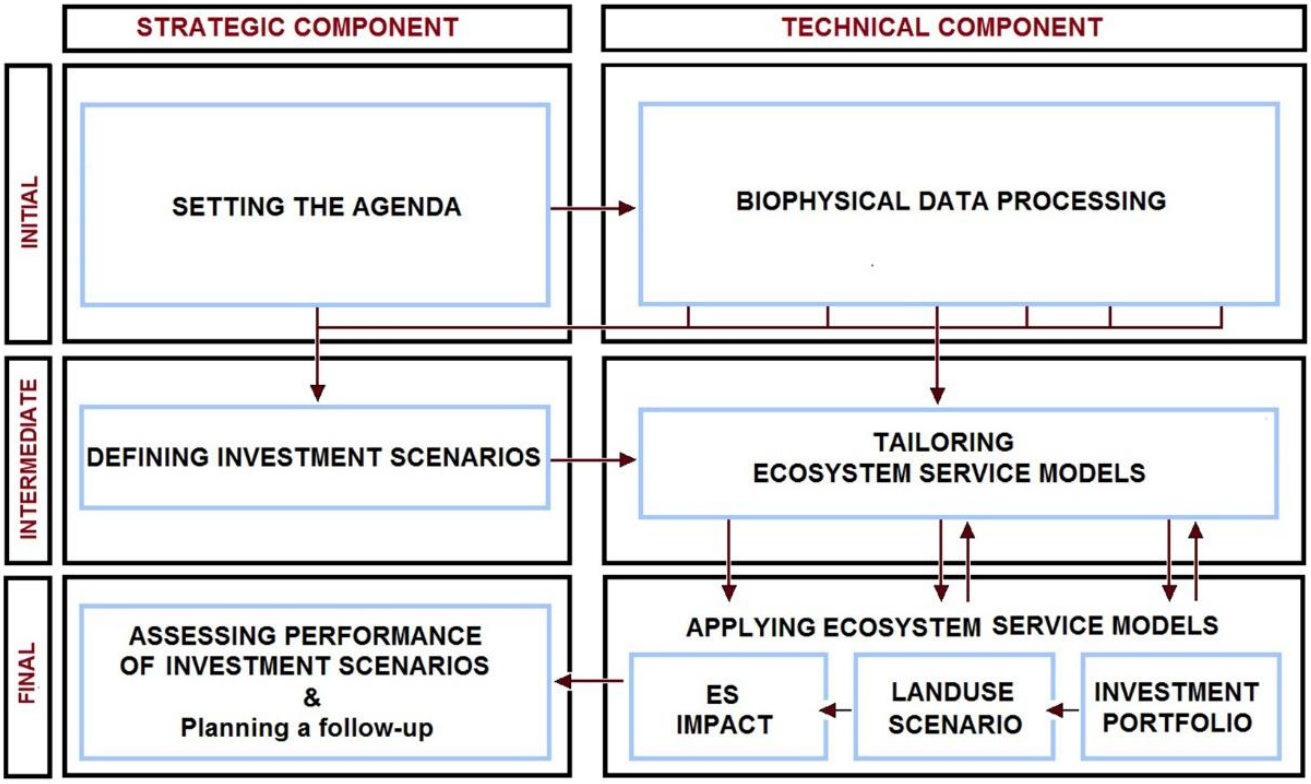

Figure 3: A process-based operative approach for designing and assessing impact of watershed investments, building on the concepts of ecosystem services and boundary works. (Source: Adem Esmail and Geneletti, 2017).

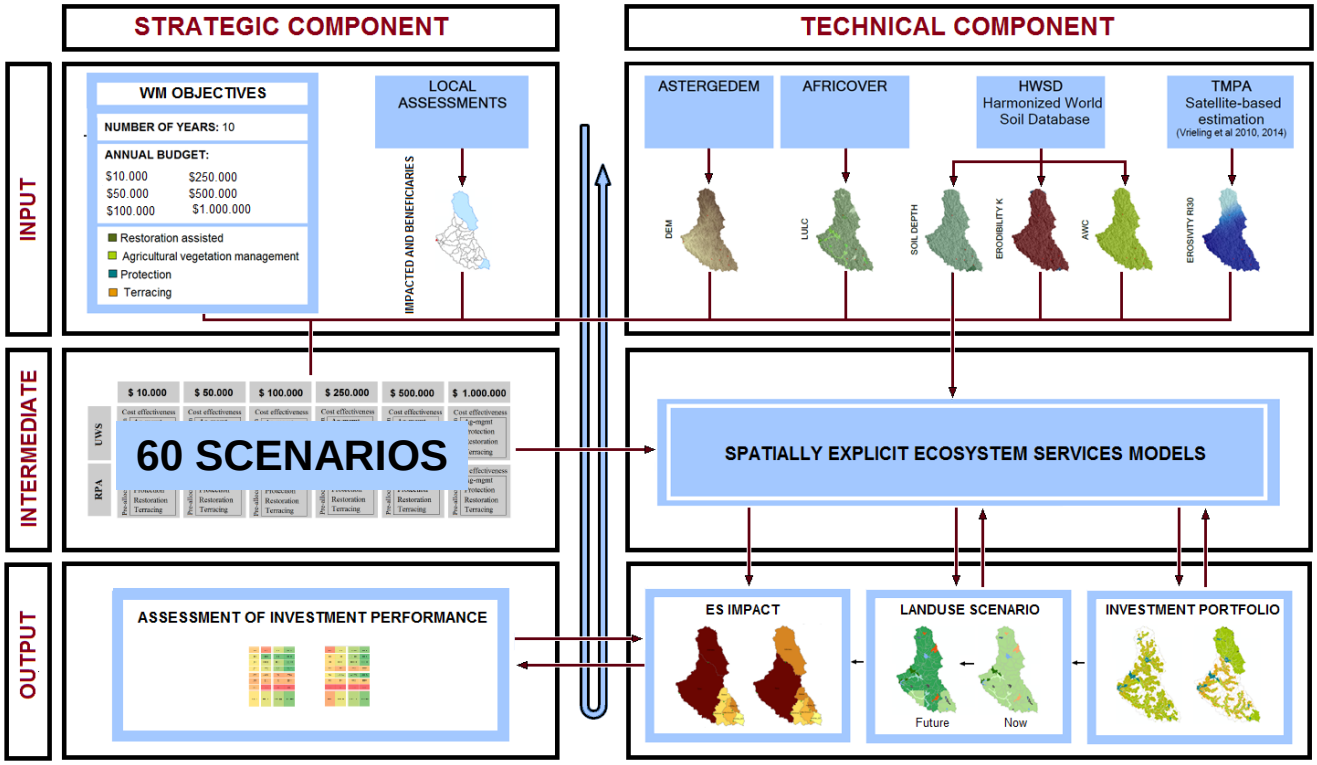

Figure 4: Application of the proposed approach to Toker watershed case study in Eritrea

A potential real-life implementation of the approach in a data scarce context in sub-Saharan Africa is shown in Figure 4. In particular, we consider soil erosion and water scarcity-related challenges affecting Asmara, and, accordingly, we adopt urban water security and rural poverty alleviation as two illustrative objectives, within a ten-year planning horizon. The application of the approach results in several spatially explicit outputs that support the design of watershed investment. A detailed description of the approach and the rationale behind is in Adem Esmail and Geneletti, 2017).

However, what is most interesting here is the fact that, by timely addressing stakeholders' concerns of credibility, saliency, and legitimacy, the proposed approach has good potential to facilitate negotiation of objectives, definition of scenarios, and assessment of alternative watershed investments, and thus to facilitate the transfer of knowledge into action. In fact the proposed approach highlights how each component of the process has differing needs of boundary work: for example, while the strategic component will have to ensure the saliency and legitimacy of the whole process, the technical component will be more concerned with the scientific credibility of the applied methods (e.g. type and quality of data, models etc.). Nevertheless, the overall success can only be one conceived as an

emergent outcome of having first addressed each concern individually, within a general context of social learning.

Indeed, a key objective of boundary work is to have everyone "on board". This means, that the process ought to incorporate appropriate strategies of communication between stakeholders, translation of complex concepts into layperson language, and eventually mediation of conflicting interests. In other words, the necessary boundary functions of boundary work should be there. To this end, for example, the two components highlight different types of needs in terms of capacity building of the involved stakeholders. By way of example, Figure 5is an attempt to translate complex computation relating to spatially explicit ecosystem services modelling in order to make them accessible to non-experts, so that they came make a meaningful contribution to the process design of watershed investments as a whole.

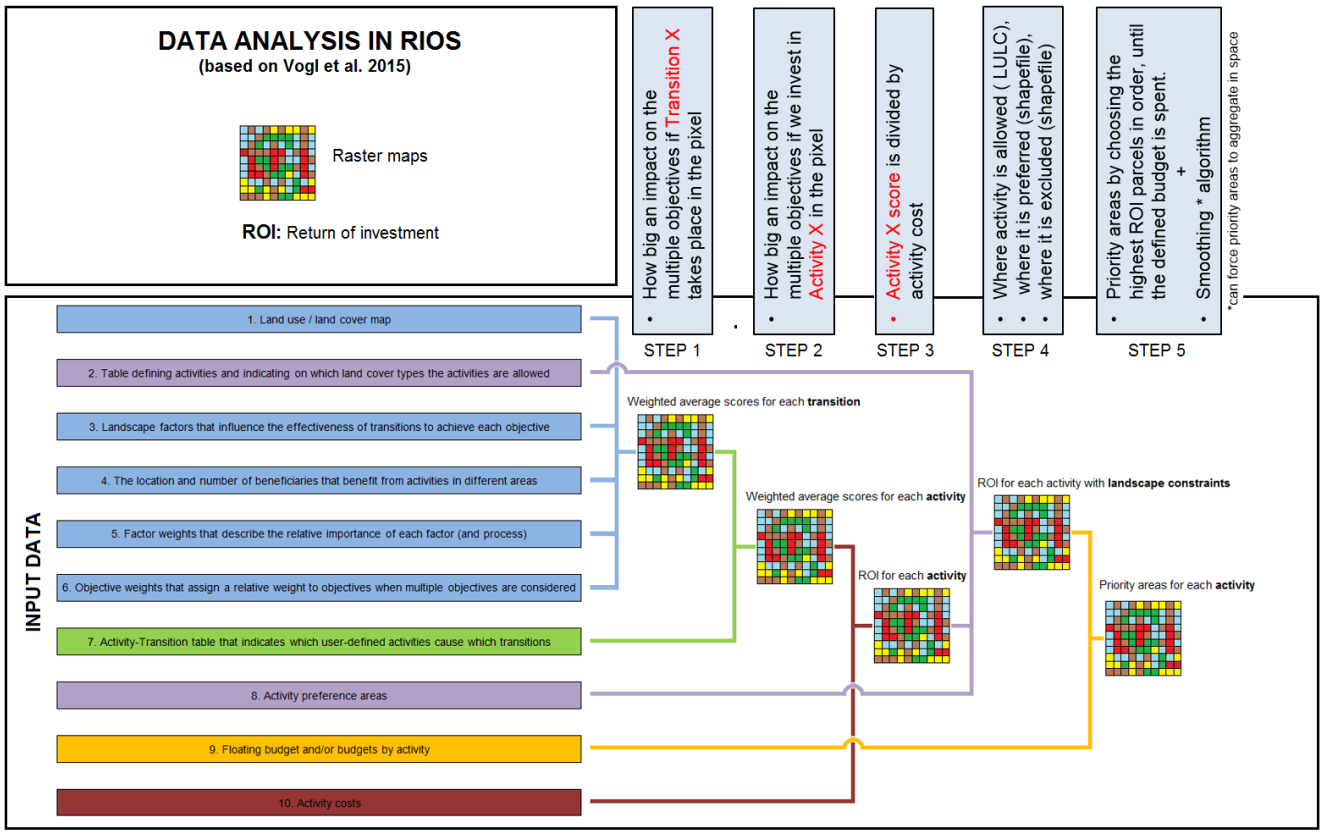

Figure 5: An example of translation of scientific concepts and methods to make them accessible to non-experts.

Finally, it is worth recalling that knowledge production is a social process, embedded in a specific socio-ecological context. A deep understanding of the contextual (relatively stable, e.g. regional identity) and contingent (relatively changeable, e.g. technological innovation) factors and the relative influence (i.e. power) of the main social actors is a prerequisite. In the case of the urban water sector, for example, water utilities are key players that represent important "gate-keepers for the introduction of any novelty in the sector" (Lieberherr and Truffer 2015). Recently, under the auspices of the World Bank, Kayaga et al., 2013 advanced a conceptualization of water utilities as learning organizations, and proposed a so-called "Water Utility Maturity Model" for assessing their institutional capacity. Beyond benchmarking purposes, the tool can be very useful identifying areas to be targeted by capacity building initiatives.

Concluding remarks

Meeting the great environment and development challenges of our century requires heavily drawing from existing knowledge, among others. Such knowledge, however, needs to be tailored to each context of application, and this is largely the essence of the so-called "third mission" of the Italian Academia. Today, this mission is made less daunting by the emergence of a better theoretical understanding of what is needed to facilitate transfer of knowledge into action. In this paper, by way of example, we illustrated how research could make a substantial contribution to addressing specific socio-ecological challenges relating to rapid urbanization in an African city. More specifically, within a frame of adaptive management, the proposed approach support a process of design and assessment of watershed investments that aim at achieving multiple goals.

Acknowledgement

A longer version of this paper has appeared in "Environmental Impact Assessment Review, 62, Adem Esmail, B. & Geneletti, D., Design and impact assessment of watershed investments: An approach based on ecosystem services and boundary work., 62, pp.1–13, Copyright (2017), with permission from Elsevier."

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List of acronyms

Fao	Food and Agriculture Organization

SESSIONE 2
LA RICERCA COME LEVA PER LO SVILUPPO: APPROCCI ED ESPERIENZE

INTRODUZIONE

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**Università degli Studi di Sassari

1. La sessione ha raccolto un numero decisamente alto di contributi, tutti pertinenti e di interesse per il Convegno CUCS 2017.I contributi hanno coperto una serie di aree geografiche di primario interesse, dal sud-est asiatico, all'America Latina, all'Africa.La maggior parte dei lavori si è confrontata con i temi della sostenibilità, avendo un'attenzione particolare per la dimensione sociale dei problemi di sicurezza alimentare e ambientale.La cooperazione ha avuto nella generalità dei casi dei contenuti di ricerca applicata e, in vari casi, si è assistito anche a progetti specifici per l'educazione e la didattica.Diversi donors, dal MAECI, alla Commissione Europea, ma in vari casi anche fondi (seed money) forniti da singole Università italiane per attività di giovani laureati, impegnati nei temi della cooperazione ed interessati ad esperienze internazionali.

2. Le relazioni presentate sono state raggruppate su temi il più possibile omogenei al fine di esaltarne le specifiche peculiarità e vengono così riassunte di seguito.

Sostenibilità Alimentare e Ambientale

Diversi studi hanno affrontato le relazioni tra cambiamenti climatici e sostenibilità alimentare e ambientale. In Nepal(1) viene evidenziato come i cambiamenti climatici abbiano avuto e avranno un forte impatto sulla produttività agricola, in particolare per le produzioni di riso, mais e grano. Lo studio indica un consistente impatto soprattutto sulle prime due colture. Tra le misure di adattamento vengono proposte quelle di un progressivo spostamento delle produzioni in aree a maggiore altitudine e l'introduzione di opportuni sistemi di irrigazione.

I cambiamenti climatici hanno un forte impatto anche sui processi migratori, soprattutto per effetto di eventi legati all'incremento dei periodi di siccità e inondazioni. Al fine di identificare le aree più

vulnerabili, uno studio[2]propone il calcolo di indici di vulnerabilità e resilienza con lo scopo di monitorare zone particolarmente sensibili e possibilmente prevedere eventi avversi. Un'analisi di alcune aree dell'Etiopia ha messo in evidenza l'utilità di tali indicatori nel rilevare aree con maggiori criticità.

Uno studio ha analizzato alcune problematiche relative ai ghiacciai e laghi situati nel Parco del Karakorum[3], il più grande parco del Pakistan. Gli autori hanno evidenziatonel loro lavoro che, sebbene non sussistano al momento alti livelli di criticità nell'area, si rende opportuno da un lato la prosecuzione del monitoraggio continuo data la la localizzazione dei laghi in aree fortemente vulnerabili e dall'altro lo sviluppo di strategie indirizzate alla mitigazione del rischio e gestione di calamità.

Sempre sul tema della sostenibilità alimentare e ambientale, è stato presentato uno studio sul sistema delle oasi agricole in Marocco [4]. Le oasi sono formidabili ecosistemi oggi in serio pericolo indotto dall'abbandono delle popolazioni. Le conseguenze sono la perdita delle pratiche tradizionali di coltivazione e irrigazione che generano un progressivo degrado delle oasi marocchinepatrimonio naturale dell'UNESCO. Una delle strategie proposte è quella dell'introduzione di nuovi macchinari, di piccole dimensioni, che consentirebbero sia incrementi di produttività e di sicurezza per gli operatori sia il loro utilizzo da parte delle giovani generazioni e, in particolare, delle donne.

Formazione

Con l'obiettivo di accrescere la qualità delle produzioni manifatturiere e allo stesso tempo garantire lo sviluppo sostenibile, è stato presentato uno studio condotto su 18 imprese del Myanmar[5] che mira ad accrescerne la capacità imprenditoriale mediante nuove collaborazioni tra le imprese sui temi dell'identificazione e riduzione degli sprechi.

Il potenziale uso improprio di scoperte scientifiche e tecnologiche a fini criminali e la conseguente minaccia nell'opinione pubblica è l'oggetto di analisi di uno studio [6]intrapreso nell'ambito di iniziative dell'Unione Europea tese a mitigare i rischi non convenzionali dovuti a cause intenzionali (ad esempio attacchi terroristici), accidentali (incidenti a siti industriali) o naturali (focolai di pandemie).Nello studio si presentano le attività di cooperazione in diversi paesi del Sud-Est asiatico in corsi di formazione, sessioni didattiche, esercitazioni e sessioni interattive di formazione con

competenze transdisciplinari che coprono settori quali chimica, biologia, tossicologia, medicina, ingegneria e diritto internazionale

L'obiettivo di un ulteriore studio presentato nella sessione ricerca è la realizzazione di laboratori galenici(7) all'interno di strutture sanitarie situate in paesi in via di sviluppo. Le principali motivazioni sono quelli di garantire alle popolazioni locali medicinali conformi a requisiti di qualità adeguati per combattere il fenomeno diffuso delle medicine contraffatte nei paesi in via di sviluppo, personalizzare i dosaggi e minimizzare l'impegno finanziario per la preparazione dei medicinali. Nella sessione sono stati presentati i risultati dell'introduzione delle precedenti metodologie in un ospedale pediatrico situato a Port au Prince, Haiti dovesi è resa necessarial'introduzione di una nuova formula per medicinalidestinati al trattamento di malattie dei bambini

Le tecnologie legate all'ICT sono ritenute strumenti chiave per rafforzare la voce delle comunità indigene, a livello nazionale e internazionale, consentendo loro di mediare questioni e bisogni precedentemente bloccati nella sfera locale per la mancanza di accesso ai punti di comunicazione convenzionali. Nello studio(8) vengono evidenziati i punti di forza e debolezza nell'uso di ICT in comunità indigene della Guaiana.

Tema di un ulteriore studio,localizzato in Palestina e presentato nella sessione, è quello dell'emancipazione di individui, in particolare donne, affette da disabilità favorendone l'empowerment. Lo scopo è quello di introdurre nuove metodologie partecipative capaci di fornire nuove informazioni sulle disabilità e l'elaborazione di politiche e la pianificazione di interventi di cooperazione internazionali(9).

Sviluppo Urbano

In tema di sviluppo urbano uno studio ha illustrato l'utilità delle competenze geografiche nei progetti di cooperazione e nella definizione della scala territoriale adeguata per attuare gli obiettivi del progetto. Nel lavoro(10) vengono evidenziate diverse esperienze svolte dal Laboratorio di geografia Sociale dell'Università di Firenze.

Dall'insieme delle relazioni emergonotra i punti di forza il buon livello dell'alta formazione e della cooperazione universitaria italiana e un patrimonio di eccellenze e conoscenze accompagnate da una fitta rete di relazioni internazionali. Destano invece preoccupazione le prospettive delle attività,

anche di successo, nel lungo periodo. Le ricerche spesso si estinguono con la fine del progetto o del finanziamento. Un secondo aspetto è quello delle collaborazioni fra Università italiane che, a parte quelle relativealle iniziative congiunte a livello cittadino fra università e politecnici, come nel caso di Milano e Torino, sono risultate molto limitate. Molto spesso le attività sono state condotte in collaborazione con ONG locali. Limiti sono osservabili anche nella comunicazione, il che fa sì che esperienze di potenziale interesse e possibili best practices non sono adeguatamente conosciute né nei paesi beneficiari, né altrove. E' senza dubbio un piano su cui l'attività del CUCS potrebbe risultare utile per rafforzare e stimolare la collaborazione interuniversitaria.

1. Daniele Bocchiola, Lavinia Brunetti, Andrea Soncini, Francesco Polinelli and Marco Gianinetto, *Food security of Nepal under climate change*
2. Elena Belcore, Angela Calvo and Alessandro Pezzoli, *Local migrations and climate change: the incapacity to adapt index. A case study in the West Arsi Woreda (Ethiopia)*
3. Guglielmina Diolaiuti, Claudio Smiraglia, Daniele Bocchiola, Antonella Senese, Carlo D'Agata, Davide Maragno, Davide Fugazza, Andrea Soncini, Roberto Sergio Azzoni and Elisa Vuillermoz, *Inventory of glaciers and glacial lakes of the central Karakoram National Park (pakistan) as a contribution to know and manage mountain freshwater resource*
4. Francesco Garbati Pegna, Pietro Bartolini, Lhoussaine El Rhaffari, Soumia Fahim, Enrico Bonaiuti, Quang Bao Le and Claudio Zucca, *Sustaining moroccan oasis agricultural system through small mechanization inputs*
5. Monica Rossi, Rossella Luglietti and Sergio Terzi, *Promoting Sustainable Development with Lean Thinking. A Cooperation Project in Myanmar*
6. Matteo Guidotti, Massimo Ranghieri, Pietro Costanzo, Federico Benolli and Simona Cavallini, *Researchers, Trainers and First Responders: a Synergy for an Improved Prevention of Chemical, Biological, Radiological and Nuclear Risks in South-East Asian Countries*
7. Francesca Baratta, Irene De Pellegrini, Maria Beatrice Iozzino and Paola Brusa, *The A.P.P.A.® Project: formulation, stability and quality study of a pediatric galenic preparation for the treatment of sickle cell disease at Saint Damien Hospital in Haiti*
8. Elisa Bignante, *Fostering the use of ICTs in participatory visual research projects with Indigenous communities*

9. Mario Biggeriand Federico Ciani, *Research, Civil Society and Human Rights: An Emancipatory Research with Women with Disabilities in Palestine*
10. Matteo Puttilli, Mirella Loda and Stefano Bartolini, *Re-scaling and interpreting urban development. Geographic competencies for international cooperation*
11. Pietro De Marinis, Chiara Mazzocchi and Guido Sali, *Perception of Urban Agriculture in Dakar, Senegal*

RESEARCHERS, TRAINERS AND FIRST RESPONDERS: A SYNERGY FOR AN IMPROVED PREVENTION OF CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR RISKS IN SOUTH-EAST ASIAN COUNTRIES

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Sommario

Una serie di ricercatori e scienziati attivi in istituzioni italiane accademiche e di ricerca collaborano dal 2013, sotto l'egida del EU Chemical, Biological, Radiological and Nuclear (CBRN) Risk Mitigation Centres of Excellence, con rappresentanze governative ed enti tecnici in nove nazioni del Sud Est Asiatico, per rafforzare le competenze locali esistenti per prevenire, controllare e mitigare gli effetti di incidenti CBRN dovuti a cause intenzionali, accidentali o naturali. Le attività hanno riguardato corsi di formazione, lezioni, simulazioni dal vivo, esercitazioni e sessioni interattive 'train-the-trainer', alla presenza di formatori europei e di esperti locali, con competenze interdisciplinari nel campo della chimica, biologia, tossicologia, medicina ingegneria, giurisprudenza e diritto internazionale.

Abstract

Italian scientists active in national research and academic institutions have been collaborating since 2013, under the aegis of the EU Chemical, Biological, Radiological and Nuclear (CBRN) Risk Mitigation Centres of Excellence, with governmental stakeholders and technical partners, in nine countries of South-East Asia, in order to enhance the local capabilities in preventing, monitoring and responding to CBRN incidents due to intentional, accidental or natural causes. The initiatives implied training courses, didactical sessions, live simulations, table-top exercises and interactive train-the-trainer sessions, in the presence of European and local experts, with trans-disciplinary competences covering areas such as chemistry, biology, toxicology, medicine, engineering, law and international right.

Keywords

Emerging threats, chemical biological radiological and nuclear risk, South-East Asian countries, training courses, first responders.

Introduction

Along the history of humankind, every new scientific or technological finding has presented the risk of a *dual use*, for either peaceful or criminal purposes. This is valid for every branch of science and notable examples can be found since the discovery of fire (with the myth of Prometheus), passing through the preparation of dynamite by Alfred Nobel, the synthesis of ammonium nitrate (useful fertiliser for agricultural applications, but powerful explosive, at the same time), the use of nuclear fission reaction (for energy production or for warfare), up to the recent frontiers of information technologies, biotechnologies or advanced sciences (with a non-negligible potential of unexpected risks to human health and environment) (Trapp 2008).

If one considers the field of non-conventional chemical-biological-radiological-nuclear (CBRN) warfare agents, the recent rapid development of scientific and technological disciplines is leading not only to the development of new risks (*e.g.*, chemicals and pathogens with a unpredictable effects on humans, clandestine production of weapons at small scale, new high-potential explosives, etc.), but also to novel and effective methods for the control, mitigation and, in some cases, the neutralization of these threats (Gatti et al. 2008; Guidotti et al. 2010; Tucker 2010). Scientists and engineers are indeed focusing an ever-increasing attention to the design, production and development of tools and instruments for the rapid detection, identification, monitoring, protection, mitigation, decontamination and abatement of CBRN agents (Reynolds et al. 2004; Singh et al. 2016; Singh 2016; Rowland et al. 2016).

During the 20th century, in warfare scenarios, the onset of efficient and available countermeasures to minimize or eliminate the negative effects of a deliberate use of chemical or biological weapons, reduced the vulnerability of fighters and contributed to decrease (or even eradicate) the extended use of C and B agents in armed conflicts (Pitschmann 2014). In fact, thanks to the gradual development of protection devices, such as active-carbon-based gas masks, hybrid polymer-containing protective suits or ready-to-use decontamination solutions or powders, the tactical advantage of the use in battlefield of chemical and/or biological weapons has been far reduced. For these reasons, after the dramatic use of chemical warfare agents during WWI, the good technological development level attained by protection devices acted as a real deterrent and discouraged the use of non-conventional C and B weapons during WWII and later, at least in Western countries (Bismuth et al. 2004).

Nevertheless, since the beginning of 21st century, new global equilibria and the growing threat of terrorism prompted institutions and research agencies to devote special efforts in the search for novel enhanced methods of prevention, protection and defence against attacks perpetrated by means of non-conventional weapons. In particular, nanosciences, nanotechnologies and biotechnologies are disciplines which can lead to optimised methods, tools and equipment to counteract efficiently and effectively CBRN threats. In fact, the higher the level of development of protection/defence techniques, the lower is the risk of non-conventional weapons in a warfare or terrorist scenario and the lower is the vulnerability of population, rescuers, first responders and military personnel.

Along with the risk of use of CBRN agents for criminal purposes, the possible occurrence of technogenic unintentional incidents caused by the presence, release or mishandling of chemical, biological and radiological hazardous materials is a theme attracting a relevant attention at global level too. There is indeed no need to recall the impressive impact, also at psychological level (Guidotti et al. 2007), on the public opinion by major disaster events, such as Seveso (C event, Italy, 1976), Bhopal (C event, India, 1984), influenza pandemics (B events, e.g. Sars, 2003, swine flu, 2009, from Far East worldwide), Chernobyl (R event, former Ussr, 1986), Fukushima (R event, Japan, 2011).
In these scenarios, aiming at a good risk management, an efficient prevention and an effective response, only a thorough knowledge of the threat and of the available countermeasures can lead to a lower vulnerability and to fewer final damages. In addition, only an adequate formation and training in the field of prevention, defence and management of emergency events involving hazardous materials can help in getting rid of widely-diffused misconceptions and false commonplaces linked to the idea of non-conventional warfare (Gundry 2007; Guidotti et al. 2015). Actually, an improved knowledge helps in lowering the feeling of powerlessness experienced by many people when talking about mass destruction weapons. It also undoubtedly helps emergency professionals and experts in achieving an enhanced level of preparedness and capacity to response to major emergency situations.

Initiatives in South-East Asia involving researchers, trainers and first responders

The European Union CBRN Risk Mitigation Centres of Excellence (CBRN CoE) is an initiative of the European Union launched in 2010 and addresses the mitigation of and preparedness against

risks related to hazardous CBRN material and agents, working in 54 non-Eu countries spanning from Eastern Europe to Asia and Africa (http://www.cbrn-coe.eu/ last access: 01/01/2018).
The proliferation by either states, or terrorist groups, of weapons of mass destruction was identified in the European Security Strategy as 'potentially the greatest threat to EU security'. According to this point of view, by enhancing the security at local scale, the global security will be enhanced at worldwide level as well.
Existing international and national strategies in non-proliferation issues acknowledge the importance of developing a comprehensive approach, but tend to implement isolated activities perpetuated by the traditional divisional structuring of chemical or biological or radiological or nuclear sectors. Therefore, the CBRN issue is often fragmented into pieces, which are thus studied according to their own characteristics, but without a true holistic approach and a research for synergies. This might be counterproductive, since no single organisation possesses all necessary resources, expertise and statutory power to face all possible aspects of the problem.

In the framework of CBRN CoE, a series of initiatives was launched in response to the need to strengthen the institutional capacity of countries outside the Eu to tackle and mitigate non-conventional risks due to the use, misuse or intentional, accidental or natural release of chemical, biological and/or radiological hazardous materials. Risk mitigation comprises prevention, preparedness and post-crisis management.
The ultimate goal of these actions is indeed to improve the preparedness, resilience and recovery capability of the broad community of the partner countries before, during and after a non-conventional CBRN event occurs. Such target can be achieved by enhancing the local capabilities in preventing, monitoring and responding to CBRN incidents.

Enhancement of CBRN capacities in South-East Asian countries

In particular, the present report describes the Project no. 46 of the initiative, named "Enhancement of CBRN capacities of South East Asia in addressing CBRN risk mitigation concerning CBRN first response, biosafety and biosecurity, awareness raising and legal framework", which started in June 2015, for a period of 3 years.

In the first part of this Project, a team of Italian scientists active in national research and academic institutions have been collaborating, under the coordination of Fondazione Formit (Italian non-profit foundation promoting institutional projects linked to innovation and technology transfer), with governmental stakeholders, national agencies and technical partners in seven countries of South-East Asia (Sea), namely: Lao, Cambodia, Viet Nam, Myanmar, Brunei Darussalam, Malaysia and Philippines (Figure 1).

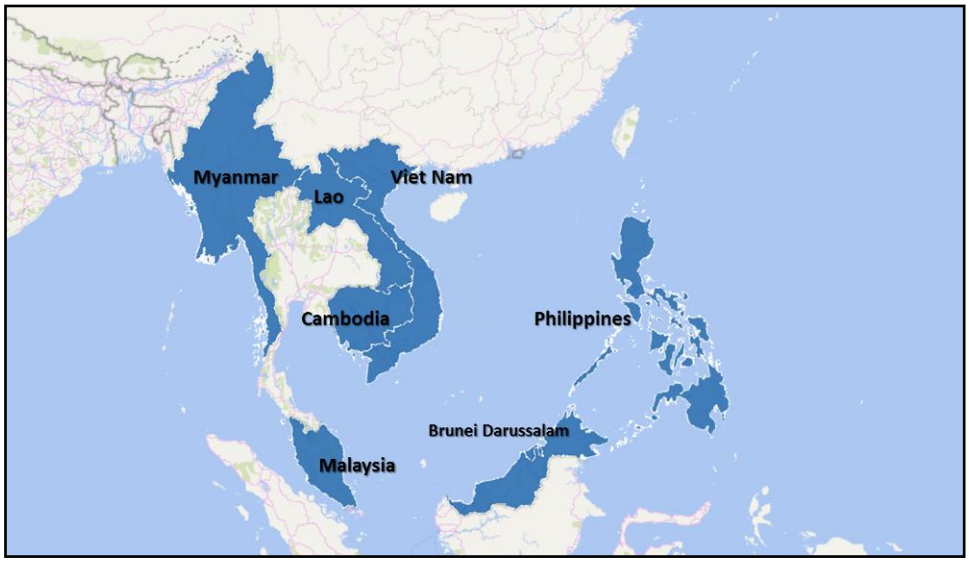

Figure 1 - Countries of South-East Asia region involved in European Union CBRN Risk Mitigation Centres of Excellence Project no. 46 initiative: Lao, Cambodia, Viet Nam, Myanmar, Brunei Darussalam, Malaysia and the Philippines

The Italian experts focused their efforts on the enhancement of the capacity of local first responders (fire brigade, ambulance services, HazMat teams, law enforcement agencies, armed forces, on-field analytical laboratories, etc.) in the management of crises and emergency situations in which CBRN hazardous materials are involved.

The cooperation activity implied the delivery of a one-week long training session for multi-agency CBRN incident commanders in each Sea country in the period between October 2016 and May 2017 (Figure 2).

The training was composed of modules, didactical sections, live simulations, table-top exercises and interactive train-the-trainer sessions, with the help of experts featuring trans-disciplinary competences and covering areas such as chemistry, biology, toxicology, medicine, engineering, law and international right.

A working group of some 20 to 30 professionals selected from local agencies with institutional roles as strategic-level coordinators / commanders in CBRN incidents was the ideal target audience for such training programme.

In order to gather the broadest information as possible about needs and priorities and to meet at best the requests by each country, a preliminary series of fact-finding missions has been performed on site, during which the potential points of weakness and the main gaps in preparedness against CBRN incidents have been evidenced and pointed out.

Then, especially in those countries in which a response capability in major CBRN events was already present or well established, the Project leaders have designed and tailored a syllabus for the training activities in collaboration with the representatives of the most relevant local governmental agencies.

Figure 2 - CBRN incident command course training sessions in Cambodia (top left), Lao (top right), the Philippines (bottom left) and Malaysia (bottom right). Training module on electronic and web-based resources for CBRN first responders and incident commanders (top centre).

Tailoring a training course programme for CBRN Incident Commanders

In general, the leading topics touched during the training sessions for CBRN incident commanders can be summarised as follows:

- definition of chemical, biological, radiological and nuclear risk
- risk assessment
- civil protection doctrine
- detection, protection and decontamination of CBRN hazardous materials
- legal framework at national, regional and supranational level
- health and medical aspects in CBRN emergencies
- decision-making processes
- handling, transportation and management of hazardous agents; disposal of toxic wastes
- roles and responsibilities in a response to a major CBRN event
- multi-agency coordination in major non-conventional emergency events
- use of electronic and web-based resources as tools for CBRN incident commanders.

Some training modules, such as those related to misconceptions and common places on CBRN agents and threats or a critical review on detection, protection and decontamination techniques available at prototypal and commercial level, have been designed in collaboration with a trans-disciplinary pool of experts, so that the trainees could get familiar not only with 'one' unique correct approach to a response to a CBRN incident, but, rather, with a multi-faceted point of view, obtained from a comprehensive survey of the current standards, protocols, rules and guidelines at worldwide level. This wide-ranging approach is particularly relevant when different legal frameworks and regulations are compared and, therefore, various approaches to the management, transportation or disposal of hazardous materials and dangerous waste, such as the European, North-American, Japanese, Australian, etc. ones, have to be taken into account.

The leading idea underlying the training programme, indeed, is to provide the delegates taking part into the didactical sessions with the key information and tools to build up and/or strengthen a national response capability against natural or man-made CBRN disasters, following tailored self-established guidelines that best fit the national situation. This approach is to be preferred to the

mere application of external ready-to-use protocols, designed for Western countries, which can be rarely adapted to the Sea scenarios without significant ameliorations and modifications.

It is, however, worth highlighting that in none of these activities the transfer of information and know-how was in one direction only. On the contrary, thanks to the active participation and the designation of technical experts from the partner countries, the Italian team experienced a continuous bilateral sharing of information, which facilitated the development and the implementation of the project in the region and allowed the European delegates to acquire a broader insight onto the on-site already existing capabilities.
In all cases, a special emphasis was devoted to adult-learning principles and teaching skills in order to provide the participants with the skills necessary to cascade the training programme to their colleagues. This 'train-the-trainer' approach formed a key element of each training programme and it was particularly appreciated in the largest countries of the Sea region (like Philippines, Malaysia or Myanmar), where a programme of training courses can be now organised by newly-formed local trainers in other parts of the partner countries, for operators working in remote provinces and poorly accessible areas.
Furthermore, a special attention was also paid to language issues, for those countries in which the use of English is not adequately spread across professionals of the CBRN emergency mitigation sector. In several cases, the presence of native-tongue technical interpreters was a key factor to encourage the interactive (and sometimes proactive) participation of experts with well-established local skills, although with a less evident international expertise.

The possibility to exchange and transfer know-how, expertise and good practices, at technical level, not only across participating nations, but also across participating local agencies was another main achievement of the training activities along the project. These training sessions were often, in fact, an ideal occasion to stimulate inter-agency discussions within the hosting countries, encouraging novel and effective collaborations among entities who seldom work together.

Three main classes of actors have been evidenced in almost all of the Sea countries, namely:

1) governmental researchers and academic experts, who are at the forefront of the scientific and technological advancements;

2) institutional and/or governmental representatives, who are active at the regulatory, policy and decision-making level;
3) first responders, who eventually operate at the incident site, either as non-specialised or as CBRN expert units (typically HazMat teams of the Fire Protection Services or special Eod military units).
In several cases, indeed, the one-week training activity has been the first effective occasion of working together, even though on simulated hand-on situations only, for delegates of institutions from different ministries of the same nation.

Involving governmental stakeholders and decision-makers in training initiatives for CBRN Responders

The participation of institutional delegates from Sea countries to the training courses is summarised in Table 1 and Figure 3. Among the most relevant agencies and governmental institutions involved, it is worth mentioning: national ministries of Home Affairs, National Security, Defence, Health, Education; Fire Services, Fire and Rescue Departments, Civil Protection, Police Forces, Ambulance Forces, Hospitals, national Red Cross committees, Customs and Immigration Offices, Coast Guards, State Universities.

Table 1 - Number of individuals and agencies involved in the CBRN incident command course training in South-East Asian countries in the framework of EU CBRN Risk Mitigation CoE Project 46. October 2016 – May 2017.

Countries	Individuals	Agencies				
	Participants	Ministries	LEAs	Defence	Hospitals	Universities
Brunei	18	1	5	1	0	0
Cambodia	21	5	1	1	0	0
Lao	33	5	1	0	4	1
Philippines	33	2	8	1	0	0
Viet Nam	15	4	4	2	0	0
Malaysia	33	4	7	1	0	0
Myanmar	23	8	2	0	0	1
TOTAL	**176**	**29**	**28**	**6**	**4**	**2**

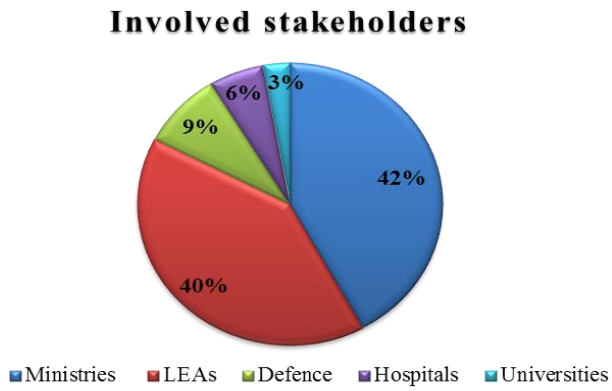

Figure 3 - Percentage of involved stakeholders in the CBRN incident command training course in seven Sea countries. LEAs: Law-Enforcement Agencies.

During the interactive table-top exercises and the hands-on simulation sessions, it has been possible to perform a general survey and analysis on the points of strength and weakness of the local situation in the field of CBRN inter-agency strategic response preparedness and capabilities.
Some important key concepts, valid for the entire South-East Asia region, have been pointed out:

- Interoperability is an essential factor for a successful response to a major emergency event. This means not only having an efficient inter-communication across agencies and professionals at the incident scene, but also (and in particular) planning and setting up common command structures, defining joint standard operating procedures, sharing information and intelligence and homogenising decision-making models.

- Only a limited set of rules and regulations involving production, management and control of highly hazardous CBRN materials are currently valid at worldwide level. It is the case, for instance, of the Un Global Harmonised System (Ghs) for the identification and transportation of dangerous goods (United Nations 2015), the Cwc or the Btw conventions for the ban and control of chemical and biological warfare agents, respectively (Opcw 2005; Btw 1975). On the other hand, many other guidelines are valid on a national or regional basis only, such as the Reach regulation (https://echa.europa.eu/regulations/reach), the Fda standards (https://www.fda.gov/food/guidanceregulation/) or the Protocol Dangerous Goods (http://asean.org/), which are valid at Eu, Usa or Asean level only, respectively. Therefore, harmonised common protocols are a goal to be reached by working together on a model which all

can adopt, without imposing one model on another. This is also possible by merging the best guidelines at international level (Eu, North America, Japan, Australia, Asean countries, etc.) and adapting them to the local situation (Cavallini et al. 2014).

- The most advanced scientific outcomes of sustainable development can represent a powerful tool and a competitive advantage to overcome technical and/or economical limitations found in some partner countries.

For instance, by adopting the principles of the Green and Sustainable Chemistry for a cleaner, safer and environmentally-friendly production of chemical substances, it is possible to avoid (or, at least, minimise) the side production of large amounts of hazardous waste, remarkably reducing the problems of waste disposal (Anastas and Warner 1998; Matlack 2010). Analogously, innovative technological solutions in the field of detection, protection and decontamination of CBRN hazardous materials can help in circumventing the lack of classical stockpiles of protective and detection equipment. Indeed, miniaturised detection devices based on the latest technologies or novel decontamination formulations obtained from simple and cheap chemical components can be a viable and suitable alternative to the conventional approach to CBRN countermeasures based on large-scale facility and costly equipment (see, for instance, Lee et al. 2012). This is particularly true when the involved agencies have a limited budget for CBRN prevention / mitigation, small institutions (sometimes, non-governmental organisations) are involved and there is a discontinuous availability of funds for pieces of equipment requiring periodical maintenance and reparations.

Such an approach may allow the partner countries to exploit at best the existing resources and capabilities, building up new trans-disciplinary networks of expertise and know-how among local experts and professionals.

At the end of each training session in the beneficiary countries, in order to assess the effectiveness and the degree of success of the activity carried out by the team of Italian experts, a feedback evaluation questionnaire was circulated across the trainees. In detail, the participants were asked to evaluate the quality of the training sessions, the future impact (if any) of the course on their professional work and the usefulness of the treated topics for an enhanced inter-agency CBRN response. The delegates felt a significant improvement of their skills and knowledge with regard to all of the proposed training themes, but the most positive feedback was obtained in the training

modules dealing with the CBRN Risk Assessment (Figure 4, left) and the Adult Learning Principles and Presentational Skills (Figure 4, right).

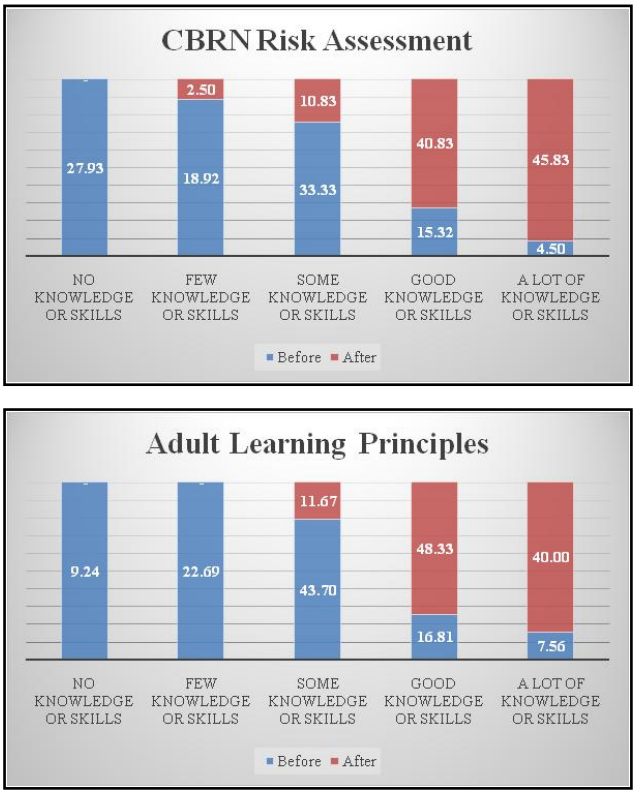

Figure 4 - Feedback evaluation questionnaire at the end of the CBRN incident command training course in seven Sea countries. Self-assessment of trainees' knowledge and skills on CBRN Risk Assessment (left) and Adult Learning Principles and Presentational Skills (right) before (blue bars) and after (red bars) the training session.

In these cases, a substantial improvement of the awareness and preparedness on these key topics was highlighted by comparing the situation before and after the delivery of the training course. In fact, while the trainees felt an average to modest level of knowledge before the training with percentage values as high as 75 % – 80 % of the total audience, they acknowledged a considerable improvement of their awareness level, with a fraction of 40-45% of the participants, after the one week-long training session (Figure 4).

Conclusions

In the framework of the European Union CBRN Risk Mitigation Centres of Excellence initiative, a series of training courses for multi-agency incident commanders have been carried out in seven South-East Asian countries. The training activity saw an innovative synergistic and multi-disciplinary interaction among academic researchers, trainers and professionals from Italian institutions and Asian first responders' agencies.

The fruitful information and the positive feedback results collected during the training campaign across Sea countries from October 2016 to May 2017 confirm that the merging of conventional didactical modules with interactive table-top exercises and train-the-trainer sessions can be a viable approach for the successful implementation of cooperation programmes aiming at strengthening the regional capacity in non-EU countries to respond to non-conventional risks and threats linked to criminal or non-intentional release of chemical, biological and/or radiological hazardous materials.

Acknowledgements

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Nomenclature

Asean	Association of Southeast Asian Nations
Btw	Biological and Toxin Weapons convention
CoE	Centres of Excellence

CBRN	Chemical, Biological, Radiological, Nuclear
Cwc	Chemical Weapons Convention
Eod	Explosive Ordnance Disposal
Eu	European Union
Fda	United States Food and Drug Administration
Formit	Fondazione per la Ricerca sulla Migrazione e Integrazione delle Tecnologie
	(Foundation for the Research on Technology Migration and Integration)
Ghs	Global Harmonised System
HazMat	Hazardous Materials
LEAs	Law Enforcement Agencies
Reach	Registration, Evaluation, Authorisation and restriction of CHemicals
Sars	Severe Acute Respiratory Syndrome
Sea	South-East Asia
Un	United Nations
Usa	United States of America
WWI	World War One
WWII	World War Two

LOCAL MIGRATIONS AND CLIMATE CHANGE: THE INCAPACITY TO ADAPT INDEX. A CASE STUDY IN THE WEST ARSI WOREDA (ETHIOPIA)

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Abstract
Droughts and floods caused by climate changes impoverish rural regions and as a consequence people leave rural areas, reinforcing existing migration trends in a downward cycle.Local people movements are the first effect of the climate changes, that modify the main environmental resources. In this framework, vulnerability and resilience analysis are sound tools to identify the most critical situations. In this work, the data obtained by a survey conducted by an NGO in three Ethiopian Woredas were the input for the incapacity to adapt calculation. The index mapping highlighted a critical situation especially in one of the three analyzed Woredas.
Siccità e alluvioni causate dai cambiamenti climatici impoveriscono le regioni rurali e, come conseguenza le popolazioni abbandonano le zone rurali, rinforzando le rotte di migrazione già esistenti. Gli spostamenti delle popolazioni locali sono il primo effetto dei cambiamenti climatici che si ripercuotono sulle principali risorse naturali. In questo quadro, vulnerabilità e resilienza sono strumenti potenti per indentificare le situazioni critiche. in questo lavoro i dati ottenuti da questionari somministrati da una ONG in tre Woreda Etiopi sono stati l'input per il calcolo dell'indice di incapacità di reagire alla vulnerabilità. La restituzione grafica dell'indice evidenzia una situazione di criticità in una delle tre Woreda esaminate.

Keywords
Climate change, Ethiopia, vulnerability, migration

Introduction

The innovative "incapacity to react index" was developed in early 2017 by the researchers of the University of Turin and of the polytechnic of Turin. It analyses the climate change's effects on populations and represents the relationship between vulnerability and resilience. Specifically, it detects of the areas that can potentially show more damages and negative consequences due to climatic hazards (Belcore et al. 2017). The incapacity to react to vulnerability allows the identification of the areas of high vulnerability to climate change but low resilience. The areas where the value of the incapacity to react to vulnerability is high may become critical for the study population. This indicator can be therefore a useful tools to quickly find the areas that need to be

closely monitored: it was introduced for the first time in Belcore et al., 2017, and is calculated simply subtracting the resilience index to the vulnerability.

Belcore et Al. evaluated the vulnerability and resilience indexes applying a multifactorial weighting calculation method, and described the indexes through the selection of socio-environmental and institutional indicators and sub-indicators related to climate.

The first incapacity to react index was applied in three Ethiopian Regions.

The effects of the climate changes on the most exposed and vulnerable populations

In 2007 the document of the Intergovernmental Panel on Climate Change (IPCC 2007) confirmed with absolute certainty that the climate change is a man-made phenomenon manifested by the increasing of the average global temperatures. The effects of climate change have become increasingly evident worldwide. One of the main consequences of climate change is the variation in rainfall patterns and the increasing probability of extreme meteorological events like floods or droughts.

The relationship between water, agriculture and climate is a significant one, due to climate change. The climate change enhance the alteration of global temperatures and influences the runoff, the temperature and the chemistry of water. These effects can cause a reduction of the water quality and can damage the infrastructure used for water transport and deliver (UNESCO-IHP 2011). Higher temperatures increase the processes of decomposition and the mineralisation of the organic matter in the soil, reducing organic carbon content, and affecting the soil moisture content.

In this framework, the increasing of extreme climatic phenomenon - such as floods and drought- and the alteration of the hydrologic cycle, as well as the one of the main soil nutrients, strongly raise the natural disaster risk for growing communities, sensitive ecosystems, farmers, and manufacturers (Setegn S., Donoso M. 2015). Various areas of the world are therefore at natural disaster risk.

Many countries of the world face crises related to the effects of climate change. Scenario analysis procedures and risk assessment can identify the vulnerability of communities, predict climatic risk, and propose and test adaptation strategies. Climate, economic, political, demographic, social, and environmental factors must be considered in assessing vulnerability and coping capacities. Vulnerability analysis can have a lead role in adaptation policies designed to reduce climate change impacts and extreme events on ecosystem services that are the foundations of the human wellbeing (MEA 2009).

The natural disasters affect people everywhere; the rural poorer regions of the South of the world may have the most harmful socio-economic effects. That is because the countries in this part of the

world are characterized by a major extent to be highly sensitive to little climatic changes and a low ability to adapt to them (Watson et al. 1996). The vulnerability of these countries is the result of their geography, the high population growth, the heavy dependence from a subsistence agriculture, the shortage of natural (especially water and fuelwood) and economic resources, the weakness of social and educational services, technologies (as improved cultivation systems) and poor accesses roads (Stern 2007).

The incapacity to adapt index obtained by the vulnerability and resilience indices as a forecast method to foresee local migrations

The First Assessment Report of the Intergovernmental Panel on Climate Change issued that the greatest single impact of climate change might be on human migration and displacement (IPCC 1990).

Migration is one possible form of adaptation responses that individuals – both males and females- and households make when sensitive systems are exposed to stressed or changing environmental conditions (McLeman, Hunter 2010) (McLeman 2006) (Tacoli 2009). Certain types of socioeconomic systems are inherently more sensitive to climate-related environmental changes and are therefore more likely to adaptive migration. These include systems characterized by agricultural and natural resource-dependence where exposure to climate-related risks is high and human livelihood possibilities are limited. In cases of natural disasters and for those with fewer means to move, displacement can be an expression of failed adaption and constitute a survival mechanism.

Understanding which individuals are more likely to be damaged by the effects of climate change allows to individuate the areas that need specific actions to prevent climate change-induced displacements and migrations.

In this framework, the innovative "incapacity to react to vulnerability" index is a tool that can potentially individuate which individuals can be more damaged by climatic hazards and more likely to displacement the populations in function of the vulnerability and resilience.

Material and methods

At the beginning, the steps for the vulnerability and resilience (with an anthropic meaning) indices calculation were followed. In this case physical and demographic exposure, sensitivity (that included soil type, cultivated land, water availability and quality for the local population, number of

meals per day), adaptive capacity (with aspects regarding also the livestock, the water and the governmental aids) and resilience (with education, sanitation and economic arguments) were calculated. All the sub-indices were scaled in a 0-1 range. The incapacity to react was therefore calculated as simple difference between the vulnerability and the resilience indicators for each surveyed village in the three analyzed Woredas.

Vulnerability, resilience and incapacity to react to vulnerability

Natural disaster risk is not just a function of climatic events, but also of the system characteristics.

The vulnerability of the system includes the characteristics of the human-environment system that made it sensitive to damaging effects of extreme events. It is function of three variables: exposure, sensitivity and adaptive capacity and its calculation is well explained in Belcore et al., 2017.

The vulnerability index V was calculated as the result of exposure (E), sensitivity (S) and capacity of adaptation (Ca) (Equation 1).

$$V = (E * S) / Ca \qquad \text{(Equation 1)}$$

Particularly, the social exposure calculation was based on the population density of the studied Kebele. The physical exposure was evaluated through the application of a statistical tool, the Standardized Precipitation Index (SPI) suggested by WMO (2012). The SPI is function of precipitation and temperature in the three Woreda of the study and it was calculated as described by Belcore et al. (2017).

The sensitivity index was composed by 12 indicators categorized in three classes based on the nature of the indicators: agro-environment indicators, water indicators and Socio-economic indicators.

The value of the capacity of adaptation was defined by 4 indicators.

To detect human-environment system that can potentially show more damages and negative consequences due to climatic hazards, it is necessary consider also the resilience of the system itself beside the vulnerability. Resilience is the ability of a potentially exposed human-environment system to resist and promptly recover from disasters effects, even though the conservation of its essential base structures and functions (UNISDR 2009).

The resilience was function of 6 indicators.

The areas with high vulnerability and low resilience may be identified by the the incapacity to react index IR, that was therefore calculated, as a difference between the vulnerability V and the resilience R indices (Equation 2).

$$IR = V - R \qquad \text{(Equation 2)}$$

To evaluate the incapacity to react index were selected 28 indicators (Belcore et al. 2017).

For each calculate indicator had been created eight classes of different amplitude and had been generated also thematic maps, to deeply analyze the incapacity to react index in each study area.

The investigated area: the West ArsiWoreda in Ethiopia

Ethiopia, located in the Horn of Africa, is one of the country in which populations may be strongly affected by natural disaster. For its social, economic and climatic conditions, the incapacity to react index had been applied and tested in three district (Woredas) of the south of Ethiopia, in Oromia region.

In the last decades Ethiopia has been interested by severe droughts and humanitarian catastrophes, especially caused by the ENSO (El Niño Southern Oscillation) phenomenon and the heating of the Indian Ocean (Hulme et al. 2001, Comenetz and Caviedes 2002, Funk et al. 2012).

Ethiopia is the second most populous country in Africa after Niger (more than 96 million of inhabitants in 2014; (UNDP 2015), and in the last years it has emerged as one of Africa's rising economies. To rise the country to a middle-income nation, the Ethiopian government has been investing in economic and social infrastructure (CIA 2016). The agricultural sector is the economic engine of Ethiopia: in 2014, 47.7% of the GDP is accounted by agriculture, with a total of 75.1% of labour force (FAOSTAT 2015).

The Oromia Region is the most populated Region (around 40 million people, IWMI 2009). The most represented ethnicity is the Oromo (it cover the 85% of population) and it is chiefly rural, with a large amount of livestock (CSA 2007). The Region is located in a large drainage basin with a quite good quantity of water, but the current management system is not able to provide a sustainable water access to the population (LVIA 2015).

The incapacity to react to vulnerability index was applied in a study that interested three Woredas of the Oromia Region: Siraro, Shalla and Shashamane, located in the West Arsi zone, along the Rift Valley.

The study based the evaluation of the index on data collected in 2015 by the NGO LVIA (with a questionnaire carried out to gathering information on the food security condition of the area) and by a project of the University of Turin. To evaluate the hazard and the effect of climate change in these Ethiopian areas, an innovative methodology using the vulnerability analysis was applied, with a deeper study of the system and of the attribute of concern, considering men and women different answers to the questionnaires and with in-depth interviews. The methodologies used to collect data

were self-assessment questionnaires administrated by LVIA officers to the heads of the household and validated by the researchers of the University of Turin, focus groups performed in rural communities, and individual interviews to relevant stakeholders (i.e. water ministries officers, head of villages and members of water committees).

Results

Concerning the vulnerability, highest is the class, highest is poor and weak the study area. In this case study, it seems that the human-environment system is not too much vulnerable, as visible in Figure 1.

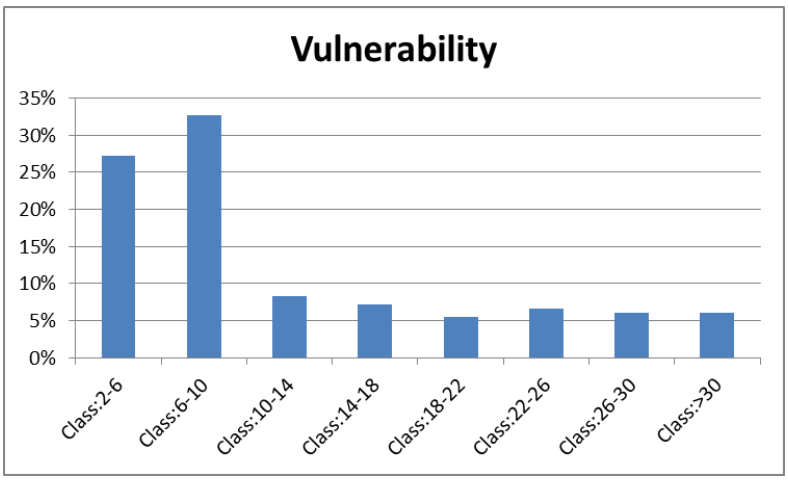

Figure 1. Distribution of vulnerability classes in the study area

On the contrary, the resilience has a different distribution among the classes (Figure 2), underlying a not always good values (higher is the resilience, higher is the human-environment system ability to adapt to critical situations, as scarcity of water, inputs and food).

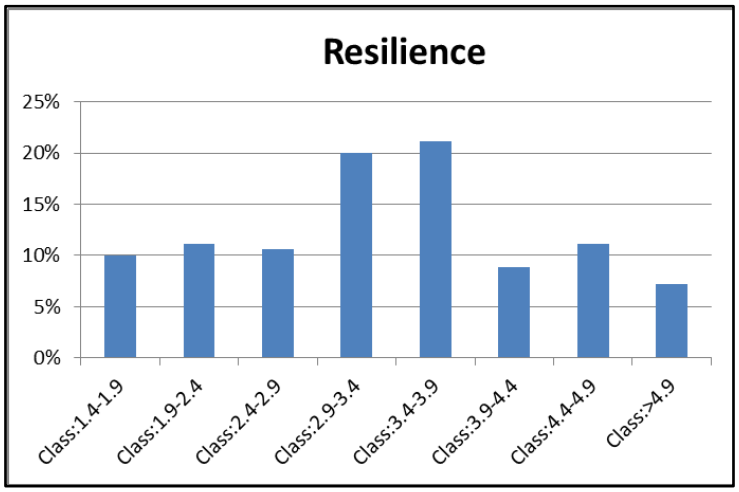

Figure 2. Distribution of resilience classes in the study area

It is therefore interesting to analyze the incapacity to react index distribution (Figure 3), that highlights a 45% of good capacities in the three Woredas.

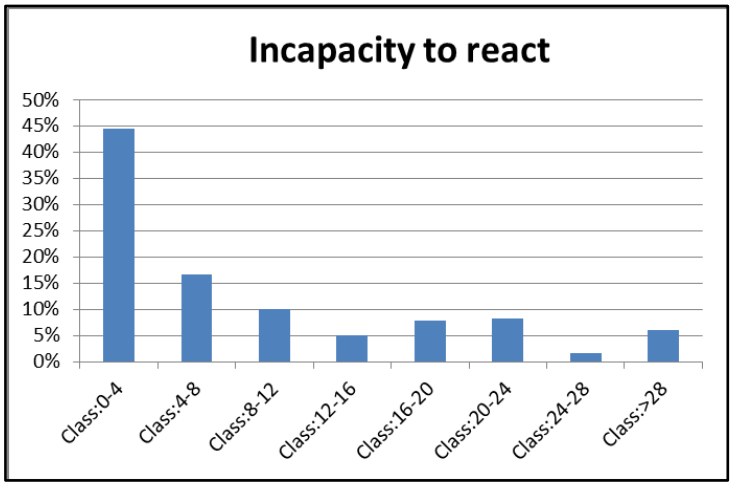

Figure 3. Distribution of incapacity to react classes in the study area

On the contrary, analyzing where are located the most critical areas in the three study Woredas, it come out that the most critical conditions are in the Woreda of Siraro (Figure 4).

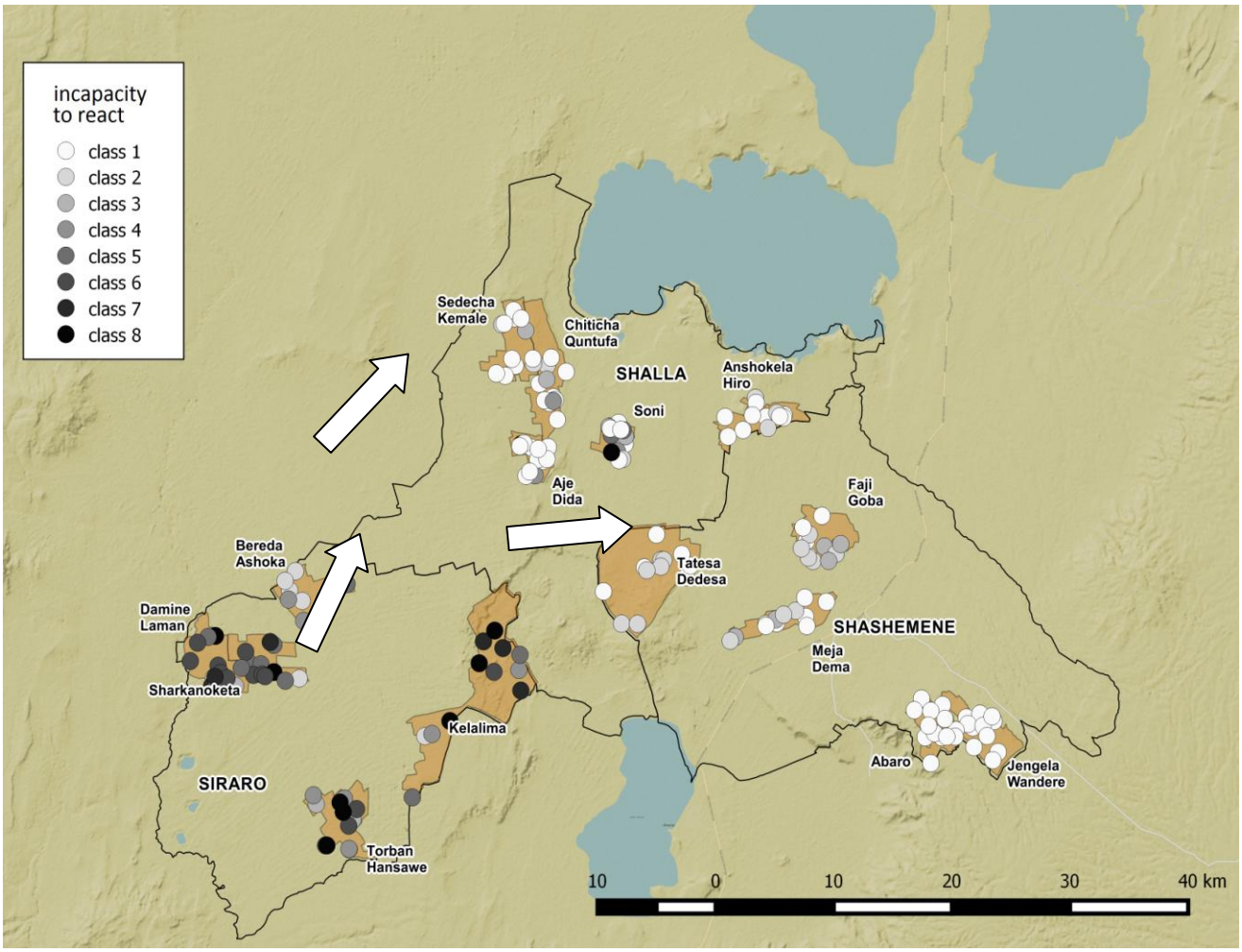

Figure 4. Incapacity to react index map. The image describes the geographical distribution of the observation in the Kebeles of Siraro, Shalla and Shashamane. (Belcore et al. 2017)

The SiraroWoreda shows the highest values of incapacity to react, the low resilience and elevated value of vulnerability, create the conditions for possible displacement towards the closest Woredas (Shalla and Shashamane) and also in other territories (the arrows represent the foreseen displacement fluxes).

The index mapping highlights a critical situation especially in the Woreda of Siraro, where there is an evident lack of water and it is also highly exposed to the drought risk. The rainfall reduction, together with increased temperatures, negatively affect the crop production and the breeding, both at the basis of the subsistence agricultural production system. In these areas there is not the practice of the field irrigation or of the water collect for breeding purposes and the agricultural production is based only on the rainfall availability.

Conclusions

The IPCC identified as main caused for migration and displacement the loss of housing (because of river or sea flooding or mudslides); the loss of living resources (like water, energy and food supply or employment affected by climate change); the loss of social and cultural resources(like loss of cultural properties, neighborhood or community networks, particularly in the case of a devastating flood). For governments it is fundamental being able to identify a priori which area is potentially more damaged by extreme events and at climate change-induced migration in order to prevent potential human catastrophes though the creation of specific adaptation plans and policies.

The incapacity to react index is a powerful forecasting tool for displacement and local migration, which allow the immediate identification of the high risk areas. Being composed by indicators that can be tailored to suit the study area facilitates its application in different region of the world, in rural and urban areas.

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Acronyms

Ca	Capacity of adaptation
CSA	Central Statistical Agency of Ethiopia
Cucs	Coordinamento Università per la Cooperazione allo Sviluppo
E	Exposure
ENSO	El Niño Southern Oscillation
Ic	Incapacity to react to vulnerability
IPCC	International Panel on Climate Change
LVIA	Laic Volunteers Italian Association
NGO	Non-governative organization
R	Resilience
S	Sensitivity
V	Vulnerabilityindex
WMO	World Meteorological Organization

THE *A.P.P.A.*® PROJECT: FORMULATION, STABILITY AND QUALITY STUDY OF A PEDIATRIC GALENIC PREPARATION FOR THE TREATMENT OF SICKLE CELL DISEASE AT SAINT DAMIEN HOSPITAL IN HAITI

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Sommario

Ad Haiti l'anemia falciforme è una patologia molto diffusa ed associata ad un alto tasso di mortalità. A causa di ciò, nel 2016, all'ospedale N.P.H. St Damien di Port-au-Princesi è reso necessario un medicinale a base di idrossiurea per trattare i pazienti pediatrici. Non essendoci in commercio una formulazione specifica, nell'ambito del Progetto *A.P.P.A.*®, presso l'Università di Torino, è stata studiata una formulazione galenica nonchè un metodo per controllarne la qualità e la stabilità nel tempo. Il medicinaleè stato introdotto *in loco*in seguito alla formazione del personale locale ed attualmente viene dispensato a circa 50 pazienti.

Abstract

In Haiti sickle cell disease is a widespread disorder and it is associated with a high mortality. Because of this, in 2016, N.P.H. St Damien Hospital in Port-au-Prince required a medicine based on hydroxyurea to treat pediatric patients. Since there is no specific formulation on the market, in the context of the *A.P.P.A.*® Project at the University of Turin, a galenic formulation was studied along with a method to assess its quality and its stability over time. The medicine was introduced on site following the training of local staff and it is now dispensed to nearly 50 patients.

Keywords

Pharmacists,Galenics, International Health Cooperation, Sickle cell disease, Hydroxyurea.

The *A.P.P.A.*® Project

The *A.P.P.A.*® Project (*A.P.P.A.*® website) is the main activity of Aid Progress Pharmacist Agreement non-profit association; the Project is the result of the cooperation between the Department of Scienza e Tecnologia del Farmaco (Dstf) at the University of Turin and the pharmacists of the Italian community pharmacies. The Project complies with the International Health Cooperation principles and with the Italian and the laws of the guest Countries. The objective of the Project is the realization of galenic laboratories within healthcare facilities located in developing Countries. The advantages of the Project are:

- ensuring to local people medicinal products that comply with adequate quality requirements, in order also to fight the widespread phenomenon of counterfeit medicines in developing countries (Figure 1);
- customizing the dosages and pharmaceutical forms according to the actual needs of patients;
- employing local staff, to whom a profession is taught. This would encourage the opening of suitable schools;
- minimizing the financial commitment necessary to prepare these medicines.

Figure 1: Cameroun, street pharmacists

The Project is structured in six phases, through which it is possible to realize a galenic laboratory: from a preliminary pharmacoeconomic study meant to understand the actual local needs up to the quality control of the prepared galenic medicinal products analyzed in the lab of University of Turin. In the *A.P.P.A.*® labs, the medicinal products are chosen by physicians according to the real needs of the population and local technicians are trained by *A.P.P.A.*® volunteers to produce from raw materials high quality medicines. Several Projects are going on:two in Angola, two in Cameroun, two in Madagascar two in Chad and one in Haiti. Each lab differs from the others and for each of them, according to the different local needs, a specific handbook containing all formulas has been studied and it is constantly updated.

The *A.P.P.A.*® Project at St Damien Hospital

Regarding the *A.P.P.A.*® lab in Haiti, it was set up in 2012 at St Damien Paediatric Hospital of "Nos Petits Frères et Sœurs" in the Tabarre district, one of the poorest neighbourhoods of Port-Au-Prince. The St Damien treats about 16,800 children and 4,500 mothers with their new-borns every year. For the laboratory established in Haiti at St Damien Hospital, given the low availability of paediatric medicines, it was necessary to study and then introduce several specific galenic formulas. The main active ingredients were identified in agreement with local Medical Doctors taking into account World Health Organization Model Lists of Essential Medicines and costs-benefits relationship. Then a formulation study was launched preferring liquid pharmaceutical forms, more suitable for children. For each preparation absorption spectrophotometry in the visible and ultraviolet was applied to the test the formulas' quality and stability respectively in accordance with European Pharmacopeia (Ph. Eur.) and European Medicines Agency (Ema) guidelines. Up today, all formulations have proved to be stable in Refrigerated Conditions (RC) and in Standard Conditions (SC) for 12 months, in Accelerated Conditions (AC) for at least 3 months. Stability tests carried out in accelerated conditions reflect the typical climatic conditions of tropical environments and therefore help predict stability in environments where conservation at controlled temperature and humidity cannot be guaranteed. Today, the galenics are made at the lab in Haiti according to specific standard procedures, their quality is constantly checked for the quality and they are used to treat patients (Figure 2).

Figure 2: technical staff of the *A.P.P.A.*® galenic laboratory in Haiti during the preparation of medicines for oral use (left) and for injection use (right)

Study of a galenic preparation for the treatment of sickle cell disease

In 2016 at St Damien Hospital it was necessary to introduce a new formula for oral use containing hydroxyurea for the treatment of Sickle Cell Disease (Scd) in children. The availability of a therapy based on hydroxyurea (HU) suitable for the pediatric administration is relevant considering that this treatment is associated with an improvement of the quality of life and a decrease of mortality. In Haiti, Scd is very widespread and it has a subsequent serious impact on the population: its

prevalence in newborns appears to be greater than twice that among African Americans in the United States. A study conducted on 2013 at St Damien Hospital in fact underlined that the prevalence of Scd is 1 in 173 newborns, that is almost the double compared with that among African Americans in the Usa. (Rotz et al. 2013)

Sickle cell disease and hydroxyurea

The Scd is an important genetic cause of hemolytic anemia. Patients in which the disease occurs are homozygous for the HbS allele that encode the hemoglobin S (HbS) or heterozygous for the HbS allele and a second gene that code for another type of mutated-hemoglobin (hemoglobin C- HbC or thalassemia). It was observed that people heterozygous for the HbS allele are able to develop a greater resistance to malaria. In the areas where it is endemic (South-Central Asia, South and Central America and in particular Africa) the heterozygous trait is much more widespread than in other parts of the world. The presence of the heterozygous trait is greater in those countries with an important genetic influence from the African continent, such as for example Usa, Brazil and Haiti. In this latter country the individuals with African origin represents the 94% of the total population (Encyclopaedia Britannica 2016).

The distinctive clinical sign of Scd is represented by the vaso-occlusive crises (Voc). Their pathogenesis is complicated and heterogeneous: when oxygen tension is low the HbS is unstable and is prone to form spiral polymers that aggregate in voluminous and stiff particles (tactoids), responsible for the sickled shaped deformation of the red blood cells that become more rigid and obstruct the blood vessels. Moreover the sickled red cells undergo more easily to hemolysis, present an augmented adhesion to endothelium and to the other circulating cells, thus they provoke endothelial activation, the release of pro-inflammatory mediators and activation of the inflammatory cascade and coagulation pathway with a subsequent augmentation of the vasomotor tone.

Potentially all the conditions that lead to a reduction of the Hb oxygenation can trigger a Voc. The other Scd clinical signs are: intense painful events to bones and joints, cerebrovascular events, elevated risk of infections, priapism, lung diseases among which the most important is the Acute Chest Syndrome (Acs), defined as the appearance of a new pulmonary infiltrate during an X-ray examination in association with one of the following: fever, dyspnea, chest pain, desaturation, splenic or hepatic entrapment.

The standard treatment of patients affected by this disease consists in the administration of analgesics (NSAID and opioids), in the antibiotic prophylaxis during the first 5 years of life, in several vaccinations such as pneumococcal, meningococcal, Haemophilus Influenzae b type and blood transfusions.

Hydroxyurea, an inhibitor of ribonucleotide reductase, largely used in the treatment of the myeloproliferative disorders, represents the only approved drug that cause a reduction of the vaso-occlusive events typical in the serious forms of the disease. It is listed in the WHO Model list of Essential Medicines, (WHO 2017) both for the adults and the children.

Mechanism of action of hydroxyurea

It is known that the fetal hemoglobin (HbF) levels are one of the most important factors able to modify the clinical expression of the Scd.

High levels of HbF are associated with a less frequency of the painful crisis, a lower number of episodes of Acs and a reduced premature mortality. These clinical and epidemiological observations are supported by *in vitro* studies that demonstrated that the high levels of HbF inhibit the polymerization of the HbS through the formation of hybrid molecules ($\alpha 2\beta^S\gamma$), that go between the polymers and interrupt their growth. The pharmacological induction of HbF was tested by using myelosuppressive drugs, cytokines and short-chain fatty acids. Nevertheless, among all the studied molecules, HU is the only one that demonstrated effective and not very toxic. (Russo et al. 2011)

Clinical evidence

The clinical evidence and the poor toxicity of HU has been broadly demonstrated by several clinical studies thus the drug represents a valid therapeutic option for lots of patients with Scd. Since HU is a cytotoxic and cytostatic drug, initially its use in pediatric age was restricted only to children affected by severe forms of the disease. Afterwards, numerous clinical trials demonstrated that the efficacy and the toxicity of HU in children are similar to the ones in adults. The most frequent adverse effect observed, the myelotoxicity, is transitional and after the discontinuation of the treatment a rapid recovery of the hematological values takes place. Moreover, no delay in the growth has been observed. HU could also have an effect on prevention of stroke, one of the major complications in children with Scd and represents an important cause of morbidity and mortality. (Russo et al. 2011)

Toxicity

The adverse effects reported by using HU are rare; the eventual discontinuation of the drug takes place for lack of efficacy or compliance of the patient. The most frequent dose-dependent adverse effect is marrow aplasia, reversible when the drug is discontinued; this effect demands a follow-up of hematological values during the therapy. Until today considering the incidence of a leukemia transformation in patients affected by myeloproliferative diseases no difference was observed between the ones treated with HU and the ones not treated. (Russo et al. 2011)

Hydroxyurea and pregnancy

Since HUis an inhibitor of synthesis of Dna, all cells with elevated mitotic index are susceptible to its action. Thus, it is necessary to inform the patients, both men and women, about the potential risks of HUon conception and that when they would like to start a pregnancy it will be necessary to stop the treatment some months before. (Russo et al. 2011)

Posology and routes of administration

The initial dose of HUis of 10-15 mg/kg/day during 6-8 weeks. In absence of the clinical and hematological response it is necessary to increase the dose of 5 mg/kg/day every 4 weeks until a maximum of 35 mg/kg/day. A continuous oral therapy is recommended in a only daily administration. (Russo et al. 2011)

Study of a galenic formulation for pediatric use

In collaboration with the Akron Children's Hospital in Ohio, Usa, at St Damien Hospital in Haiti, during 2016 a health policy study was started with the purpose to assess the results obtained by the treatment with HU of pediatric patients affected by Scd. The results to be evaluated are not in terms of efficacy, since it has been widely demonstrated by numerous studies, but in terms of applicability of the therapeutic protocol already in use at their health facility. The applicability of a therapeutic protocol in a developing country like Haiti could be very difficult considering both the low level of education of the population and the reduced availability of infrastructures. For example, having to go monthly to the hospital to collect the medicine or understanding that it is necessary to take it daily can represent significant obstacles that risk undermining the continuity and thus the success of the therapy.

Considering the great diffusion of Scd in Haiti and the affordability of the therapy, the implications of this study could have a great impact on the quality of life of lots of Haitians.

On the market there is no pediatric formulation based on HU. The literature provides a procedure of preparation of a liquid formulation based on HU obtained from the capsules of industrial origin (Heeney et al. 2004). This procedure presents nevertheless the following several critical issues:

- the final volume of the preparation (to achieve by adding syrup) is initially measured by pouring in the immediate packaging a quantity of water corresponding to the final volume and by marking externally on the packaging the level to achieve. Certainly this is not a precise method;
- the quantity of powder (active ingredient and excipients) contained in the capsules of industrial origin to be weighed is not checked;

- the syrup chosen to achieve the final volume contains ethanol, excipient that must be avoided, if not strictly necessary, in the pediatric formulations;
- the stability of the preparation under environmental conditions typical of Haiti has not been studied.

Underlined this critical issues, it was decide to conduct an *ad-hoc* formulation study. Since the active ingredient is not available on the market for the preparation of galenic preparations it was necessary to use the powder contained by the Italian industrial medicinal product called Oncocarbide®. This consists in capsules that contain 500 mg of HU; the excipients are: lactose, calcium citrate, sodium citrate dibasic and magnesium stearate.

Considering the necessity to facilitate the pediatric administration, the good water solubility of the active ingredient and the kind of the excipients, it was decided to produce a liquid aqueous preparation. In particular, a preparation based on sucrose syrup was chosen, since it is constituted by inexpensive and easily available on site raw materials and able to give a good palatability to the preparation. The composition of the syrup for 500 ml resulted as follows:

Hydroxyurea	50 g (contained in 100 cps)
Sodium methyl p-hydroxybenzoate	0,25 g
Purified water	250 g
Saccharose syrup	q.b. a 500 ml

Considering the equipment available on site it was decided to prepare 500 ml as the maximum quantity pro batch, to be sure to guarantee the quality of the final product.
The developed procedure indicates to calculate the average weight of the powder contained by a single capsule (active ingredient + excipients) and to empty a sufficient number of capsules to obtain the intended dose of active ingredient; afterwards a solution of HU is prepared by dissolving the powder in purified water and sodium methyl p-hydroxybenzoate and by stirring. The solution must be filtered and weighed, and subsequently the quantity of sucrose syrup necessary to achieve the final volume must be added. Finally, the pH of the preparation must be measured as a preliminary control on the galenic medicine.

Quality control and stability test of the syrup of hydrxyurea

When the procedure of preparation of the new formulation was defined, a method of analysis to perform the quality control and to test the stability over time was chosen.

In the literature we found different techniques to quantify HU but the majority of them required expensive and hardly available on site equipment and reagents. Thus, it was decide to take as reference the analytical method reported in the article "Assay for Hydroxyurea" by J.F. Alicino in 1970 that is aiodometric titration. This method is inexpensive and easy to reproduce, important conditions that must be considered when, in accordance with the objectives of the Project and of the International Cooperation, we would make the laboratory independent by introducing the analytical method on site too.

J. F. Alicino reported two analytical procedures of which we chose the most reproducible even if less sensible in order to introduce the analytical method on site. The analytical method was validated in our experimental conditions through the analysis of HUPh.Eur standard and 139 tests on 15 different samples were performed. All the samples satisfied the assay uniformity of content (Ph.Eur., assay 2.9.6) (EDQM 2010): the results obtained were in the range of ±10% of the expected (nearly 90% of the results ranged between ± 5% of the expected).

To assess the stability of the preparation over time, at Dstf several samples were prepared and were analyzed after storing them in different environmental conditions established by Ema guidelines for the stability tests of the industrial medicinal products: this procedure was routinely applied for the galenic preparations introduced at St Damien Hospital in Haiti in the last 6 years. In particular, the stability test involves the preparation of the medicine and its analysis with the purpose to obtain a value that represents the starting point or time zero (T_0). After the analysis at T_0 the formulation is partitioned in different aliquots and each of them stored in different conditions of temperature (T) and relative humidity (RH %), based on the Ema guidelines (Ema website). The storage conditions of the samples detailed in the Table 1.

Table 1 – Storage conditions of the samples for the stability tests

Storage condition	T (°C)	RH %	Period covered by data
SC	25±2	60±5	12 months. Analysis at time zero (T0), every 30 days for 3 months (SC-T1 to SC-T3), after 6 months (T6), after 12 months (T12)
RC	5±3	/	12 months. Analysis at time zero (T0), every 30 days for 3 months (RC-T1 to RC-T3), after 6 months (T6), after 12 months (T12)
AC	40±2	60±5	3 months. Analysis at time zero (T0), every 30 days for 3 months (AC-T1 to AC-T3), after 6 months (T6), after 12 months (T12)

When it is scheduled, the preparation is analyzed while T_0 is used as the reference value, not only in the stability test but also in the routine quality control on medicines produced in the *A.P.P.A.*® laboratories.

The SCare applied to define the stability of samples under storage conditions accepted by the Ph.Eur; the RC are applied to evaluate the need for this type of storage. The AC allow firstly to reduce the time of analysis, since a month of conservation in these conditions is the equivalent to four months of conservation in SC (Cooperativa Farmaceutica 1996). Secondly, they help to predict the stability in the tropical environments typical of the countries where the *A.P.P.A.*® laboratories are active and the conservation of the medicinal products at controlled temperature and humidity often cannot be guaranteed.

The results achieved by the stability test for the HU syrup are listed in Table 2. The result was considered acceptable when ranged between ±10 % in comparison with T_0 value. The table reports the average percentage error obtained by the analysis of the samples stored in envisaged environmental conditions. The preparation studied as above described is stable in SC up to 6 months, in RC up to 12 months and in AC up to 3 months.

Table 2 – Results of the stability test of the hydroxyurea syrup 100 mg/ml

Storage conditions	T0	T1	T2	T3	T6	T12
	Δ%	Δ%	Δ%	Δ%	Δ%	Δ%
SC	-2,01%	+2,12%	+1,04%	-2,85%	-7,50%	-11,49%
RC	/	+3,96%	+0,61%	+0,57%	-4,76%	-5,42%
AC	/	+2,85%	-2,17%	-9,11%	-21,22%	-45,48%

In order to label the preparation with a correctly defined expiry dates necessary to guarantee the security of the patients, we took the results of the stability tests into account. We also took into account the fact that the medicines will be used in places other than the hospital, such as houses, where the environmental conditions cannot be controlled and thus the correct conservation of the medicine cannot be guaranteed. As a precautionary measure it was thought appropriate to give a validity period of three months for the prepared syrup. This is the same period for which it was tested in AC, condition that reflects the environmental conditions of Haiti.

Figure 3 - Technicians during the filtration of thehydroxyurea syrup

Introduction of the formula on site

At St Damien Hospital local staff was trained and specific procedures were introduced concerning both the preparation (Figure 3 and 4) and the dispensing of the medicinal product. Considering the potential mutagenicity and teratogenicity of hydroxyurea, during the training a particular attention was given to all phases of its manipulation, giving precise guidelines to who prepares the medicinal product, to who is dispensing it and to who would teach the relatives of the patients how to use it.
The instructions were created in French language and enriched by clear images to be understood by everyone, considering that the average level of education in Haiti is quite low (Figure 5 and 6).
The local personnel responsible for the preparation of the medicine was considered capable and autonomous to operate. In fact all the results obtained by its control of quality were positive. The process is constantly checked in order to guarantee the quality of the medicinal product in accordance with the Ph.Eur.. At Dstf we also started a new study of the HU syrup 100 mg/ml prepared using as raw materials the industrial medicinal products available on the local market, with the objective to make the galenic laboratory and thus the health facility more independent, in accordance with the International Cooperation and with the *A.P.P.A.*® Project.

Figure 4 – Technician during the preparation of hydroxyurea syrup

Thanks to the strong collaboration among all the institutions involved in the Project, in order to meet the needs of the St Damien Hospital the new formula was studied, it was successfully introduced on site and about 3 litre of syrup are prepared every week at the *A.P.P.A.*®galenic laboratory. The medicinal product is monthly dispensed to nearly 50 patients involved in the health policy study conducted by the Akron Children's Hospital, Usa. At the moment the study is giving promising results: this confirms the

quality of the galenic product and, given the great need to treat the patients affected by Scdin Haiti, the applicability of the therapy based on hydroxyurea that will improve the quality of life of many Haitians.

Figure 5 – Procedure for the manipulation of the hydroxyurea syrup meant for the personnel responsible for the dispensing of the medicine

Figure 6- Procedure for the manipulation of the hydroxyurea syrup meant for the relatives of the patients

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Abbreviations

AC	Accelerated Conditions
Acs	Acute Chest Syndrome
A.P.P.A.®	Aid Progress Pharmacist Agreement
Dstf	Department of Scienza e Tecnologia del Farmaco
Ema	European Medicine Agency
HbC	Hemoglobin C
HbF	Fetal hemoglobin
HbS	Hemoglobin S
HU	Hydroxyurea
Ph. Eu.	European Pharmacopoeia
RC	Refrigerated Conditions
SC	Standard Conditions
Scd	Sickle cell disease
Voc	Vaso-occlusive crises

Inventory of glaciers and glacial lakes of the Central Karakoram National Park (Pakistan) as a contribution to know and manage mountain freshwater resource

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ABSTRACT

In this study, we reported valuable information on the cryosphere of the Central Karakoram National Park (CKNP, the largest protected area of Pakistan and the highest park all over the world). In fact, in addition to the glacier inventory, we also estimated the glacier volume and we modeled the amount of meltwater derived from glacier ice ablation during a 18-day summer period (23 July–9 August 2011, time window where also field melt measurements were performed thus enabling a crosscheck of the obtained results). Moreover, glacial lakes were considered as well; for these latter glacier features we also analyzed their potentially dangerous conditions. All these information are given considering the CKNP as a whole and in detail by dividing it into five basins (i.e. Shigar, Hunza, Shyok, Upper Indus and Gilgit). As regards the CKNP as a whole, 608 glaciers are found with a total area of 3682.1 ± 61.0 km^2, ~35% of the CKNP area. Analyzing in detail the five basins included in the CKNP area, they reflect the overall conditions regarding glacier distribution per size class, terminus elevation, length, and thickness. The widest basin (for number of ice bodies, glacier extent and ice volume) is the Shigar basin, where the largest glaciers are present (among which Baltoro Glacier), and the smallest one is the Gilgit basin. Finally, the highest number of debris-covered glaciers is located in the Shyok basin (62 glaciers). During 18 days in summer 2011, we quantified a total water magnitude of 1.54 km^3 derived from ice melting. Even if we considered a relatively short period, this water volume equals ~11% of the reservoir capacity of the Tarbela Dam. In addition to glacier information, we provided glacial lake occurrence, as these ephemeral water bodies can develop into actual glacial risk conditions, which makes it important to list them and to survey them over time. The information reported in this study would provide base for future monitoring of glacial lakes and GLOFs and for planning and prioritizing disaster mitigation efforts in the park. In fact, even if the Potentially Dangerous Glacial Lakes (PDGLs) identified in the park territory are only 2, they are located in a high vulnerable and fragile area and the recent history suggests us to survey over time these water bodies to avoid losses of human lives and destructions of villages and communities. Moreover, many other supraglacial lakes identified in the park area could develop into conditions of PDGLs thus suggesting to prosecute the lake monitoring and to develop early strategies for risk mitigations and disaster management.

KEYWORDS

Central Karakoram National Park (CKNP); CKNP glacier inventory; CKNP glacial lake inventory; Potentially Dangerous Glacial Lakes (PDGLs); Water resource.

INTRODUCTION

The Central Karakoram National Park (CKNP, Fig. 1) is the largest protected area of Pakistan (about 10,000 km² wide plus a further 7,500 km^2 buffer zone, WWF-Pakistan, 2007), born in 1993. It is located in the Northern Pakistan in the main glaciated region of the Central Karakoram. This area is situated in the High Mountain Asia (HMA), that represents the largest glacierized region outside the Arctic and the Antarctic, the so called "Third Pole", covering an area of more than 100,000 km^2 (Gardner et al., 2013) and hosting about 40,000 km^2 of ice bodies (glaciers, glacierets and perennial ice surfaces). The CKNP is the highest park all over the world, as it is characterized by extremes of altitudes that range from 2000 m a.s.l. to over 8000 m a.s.l., including K2 (8611 m a.s.l.), the second highest peak in the world. It falls into four administrative districts of Gilgit-Baltistan Region.

The study here summarized has been developed and carried out in the framework of the SEED Project. The SEED project was aimed at an integrative development of CKNP region through supporting the implementation and management of CKNP, improving local wellbeing and livelihood options. Although the population of Gilgit-Baltistan is relatively small, it is

linguistically and ethnically very diverse. Twelve different languages tell us about the long, turbulent and rich history of the area, which manifests itself in numerous important cultural heritage sites.

However, for the people making a living in this part of Pakistan, remoteness from important education and health services and centers of commerce are the downside of the wild and untouched beauty of the province. Cash income sources are rare and in this harsh and dry mountain climate even subsistence agriculture is a feat and sickness can easily lead to serious chronic illness or death. All of these properties make people from Central Karakorum National Park living constantly at the brink of poverty. No surprise that the Poverty Reduction Strategy Paper (PRSP) of the Pakistan Government from 2004 lists rural regions in Gilgit-Baltistan province as having the 3rd highest poverty rate in the country, just after FATA and NWFP.

Gilgit-Baltistan has a unique and critical role to play in the sustainable development of Pakistan. Although the province spans a relatively small geographical area, it hosts the vital catchment of the Indus River, a key water source for Pakistan's irrigated agriculture and hydroelectricity production. Gilgit Baltistan also hosts the nation's most important natural forests, extensive mineral reserves, and a wealth of biodiversity. The dramatic scenery, some of the world's highest mountains and the rich cultural and archaeological heritage make Gilgit-Baltistan one of the most visited tourist destinations in the country.

The Central Karakoram National Park (CKNP) was officially notified as National Park in 1993. There was a tremendous pressure on the natural resources due to traditional usufruct rights of the local inhabitants, coupled with the additional need of visitors to the area. Unsustainable resource use and tourism practices were viewed as the key threats faced by the local ecosystem. Governmental and non-governmental organizations have been working at the local scale for over a decade in order to improve the economic, social and environmental situation of CKNP area. All the interventions have a common objective, but no framework that coordinates the different activities and strategies. International organizations and tourism companies do not have a legislative framework of reference, as the only law on parks is the Northern Areas Wildlife Preservation Act of 1975, which was not very effective. To tackle these deficits and achieve a better coordination of the different interventions towards the realization of CKNP, the project "Participatory Management and Development of Central Karakoram National Park (CKNP)" had been approved in June 2007 by the Northern Areas Administration; this 5 year initiative was supported by the HKKH Partnership Project, WWF Pakistan and the Karakoram Trust Project. The University of Milan was partner of both HKKH partnership and Karakoram trust project team. These initiatives were successful and useful to the development of the area but, due to a lack of funding, they were unable to produce the Park Management Plan, a fundamental tool to manage, preserve and promote the CKNP and its resources. To fill this gap was developed the SEED project, featuring the following specific aims:

1) building a strong, intrinsically scientific CKNP management, to contribute to the finalization and implementation of a management plan for Central Karakorum National Park;
2) supporting on livelihood assets and improvements of local people's wellbeing in and around the park, ensuring that they are not in conflict with, but support the park's conservation efforts;
3) Developing and supporting economy for the eco-sustainable tourism sector; for conservation areas, eco-sustainable tourism is the economic sector which is most consistent and compliant with the national park's vision, objectives and regulations.

To reach these goals the project's approach is to integrate research (and capacity building for intrinsic knowledge generation) with community development and ecosystem management. Thematically, the SEED project was focused on three main interconnected areas, which can be considered the main pillars of an integrated development of CKNP from the perspective of different prevailing approaches in the fields of macro-economic development, protected area management/entitlements, livelihood development and well-being.

Within this context, a great attention has been paid to the water resource in the CKNP area.

In fact, the CKNP holds the major source of fresh water in the Pakistan mainly due to glaciers, as they provide fresh water for civil use, hydropower production and farming (Bocchiola and Diolaiuti, 2013; Mayer et al., 2010). In fact, around half (2405 $m^3 s^{-1}$, Hasson et al., 2015) of the water in the Indus river originating from the Karakoram comes from snow and glacier melt (Immerzeel et al., 2010; Minora et al., 2015; Soncini et al., 2015; Senese et al., submitted), warranting a life to the immediate downstream Tarbela reservoir (the largest water storage structure in the country). The CKNP is therefore a key area for studying the effects of ongoing climate change on present and future meltwater discharge and a pragmatic assessment of the actual water availability from these watersheds is utmost necessary for ensuring the sustainable socio-economic development in the country.

In this study, we reported high-resolution and very detailed information on the water resource of the CKNP. In fact, in addition to the glacier inventory, we also estimated the glacier volume and we modeled the amount of meltwater derived from glacier ice ablation during a 18-day summer period. In addition to glacier information, we provided glacial lake occurrence, as these ephemeral water bodies can develop into actual glacial risk conditions (Potentially Dangerous Glacial Lakes, PDGLs), which makes it important to list them and to survey them over time. All these information are given considering the CKNP as a whole and in detail by dividing it into five basins (i.e. Shigar, Hunza, Shyok, Upper Indus and Gilgit, Fig. 1).

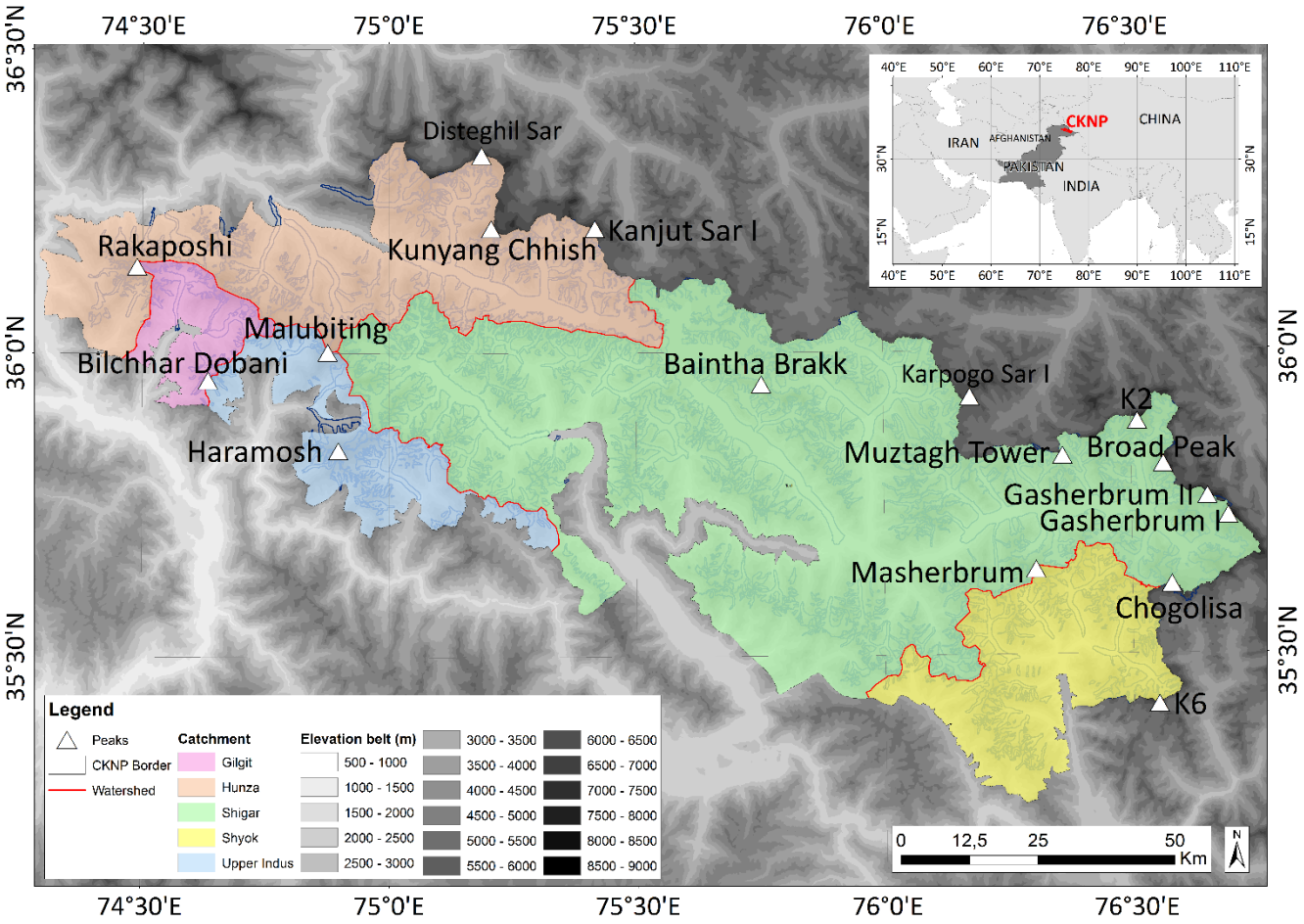

Fig. 1: The study area, the Central Karakoram National Park (CKNP) divided into five basins (i.e. Shigar, Hunza, Shyok, Upper Indus and Gilgit).

METHODS

To produce the inventory of glaciers of the CKNP and to estimate glacier volume (i.e. total fresh-water resource contained by CKNP glaciers) and meltwater, we considered i) the glacier boundaries in 2010 developed during the compilation of the CKNP glacier inventory, ii) supraglacial debris coverage and thickness in 2010 and 2011, respectively. In order to calibrate and validate our calculations, we coupled remote sensing investigations and physically based models with field observations collected during an expedition in summer 2011 on the Baltoro Glacier (the widest and representative ice body of the CKNP, 62 km long, widely debris covered). For further details regarding the approaches applied see Mihalcea et al. (2008a; 2008b), Minora et al. (2015; 2016) and Senese et al. (submitted).

The glacial lake inventory of the CKNP was derived from a general Glacial lakes inventory developed by PARC (Pakistan Agricultural research Council) and PMD (Pakistan Meteorological Department) in 2015 for the whole Hindukush-Karakoram-Himalayan (HKH) area. The occurrence of glacial lakes and their features refer to 2013. Field surveys were carried out in Hunza and Gilgit basins during 2013 in order to assess risk of flood hazards and investigate glacial environment. The criteria for identifying the Potentially Dangerous Glacial Lakes (PDGLs) are based on geo-morphological, geo-technical characteristics and records of past processes and events of the lake. For classifying a lake to be potentially dangerous, the lake physical conditions and features and its surroundings as discussed by Mool et al. (2001), Bajracharya et al. (2007), ICIMOD (2011) and PARC et al. (2015) were considered.

GLACIER INVENTORY

In the CKNP there are 608 glaciers (among which some of the largest Karakoram glaciers: Baltoro, Biafo, and Hispar, Fig. 2) with a mean size of 6.1 km^2. Their total area in 2010 is 3682.1 ± 61.0 km^2, ~35% of the CKNP area. This area represents ~24% of the glacier surface of the entire Karakoram Range within Pakistan (total area from Bajracharya and Shrestha, 2011). The Shigar glacierized area is the widest of the CKNP basins, covering more than half of the whole glacierized surface of the park (i.e. 2308.3 km^2, Table 1), and featuring the highest number of glaciers (i.e. 294 bodies, 48% of the total CKNP census, Table 1). In addition, four of the biggest CKNP ice bodies are located into this basin: namely Baltoro Glacier (604.2 km^2), Biafo Glacier (438.1 km^2), Chogo Lungma Glacier (265.0 km^2) and Panmah Glacier (264.2 km^2). Gilgit basin hosts the lowest number of glaciers (36, Table 1, corresponding to 6% of the whole CKNP glacier census) and the glacierized area is only the 2% (83.62 km^2, Table 1) of the total CKNP glaciation, thus representing the smallest one compared to the other basins.

Analyzing in details the widest basin (i.e. Shigar), on the one hand, as we found also for the other basins, the most part of glaciers (36.1% of all Shigar glaciers) features an area lower than 0.5 km^2, covering only 1.1% of the whole Shigar glaciation. On the other hand, glaciers larger than 50 km^2 cover the 70.8% of the whole Shigar glaciation. The mean glacier terminus elevation is found to be 4443 m a.s.l. (in agreement to the other four basins), ranging from 2740 to 5760 m a.s.l.

The total fresh-water resource contained in the CKNP glaciers was estimated ca. 532.37 km^3 and Baltoro Glacier is found to be characterized by the maximum volume value (128.79 km^3, Fig. 2). More than half of all CKNP glaciers (68.5%) contains a volume of water lower than 0.05 km^3, contributing only for the 0.98% over the total volume. In particular, ice bodies such as glacierets (with an area of about 0.02 km^2) feature the minimum volume equal to 0.0001 km^3.

The cumulated ice ablation from the CKNP in the time window 23 July–9 August 2011 (i.e. 18 days) was equal to 1.54 km^3 w.e., with a daily average of 0.09 km3 w.e. d^{-1}. As expected, the contribution from glaciers located into the Shigar basin is the highest one (0.92 km^3 w.e., Table 1).

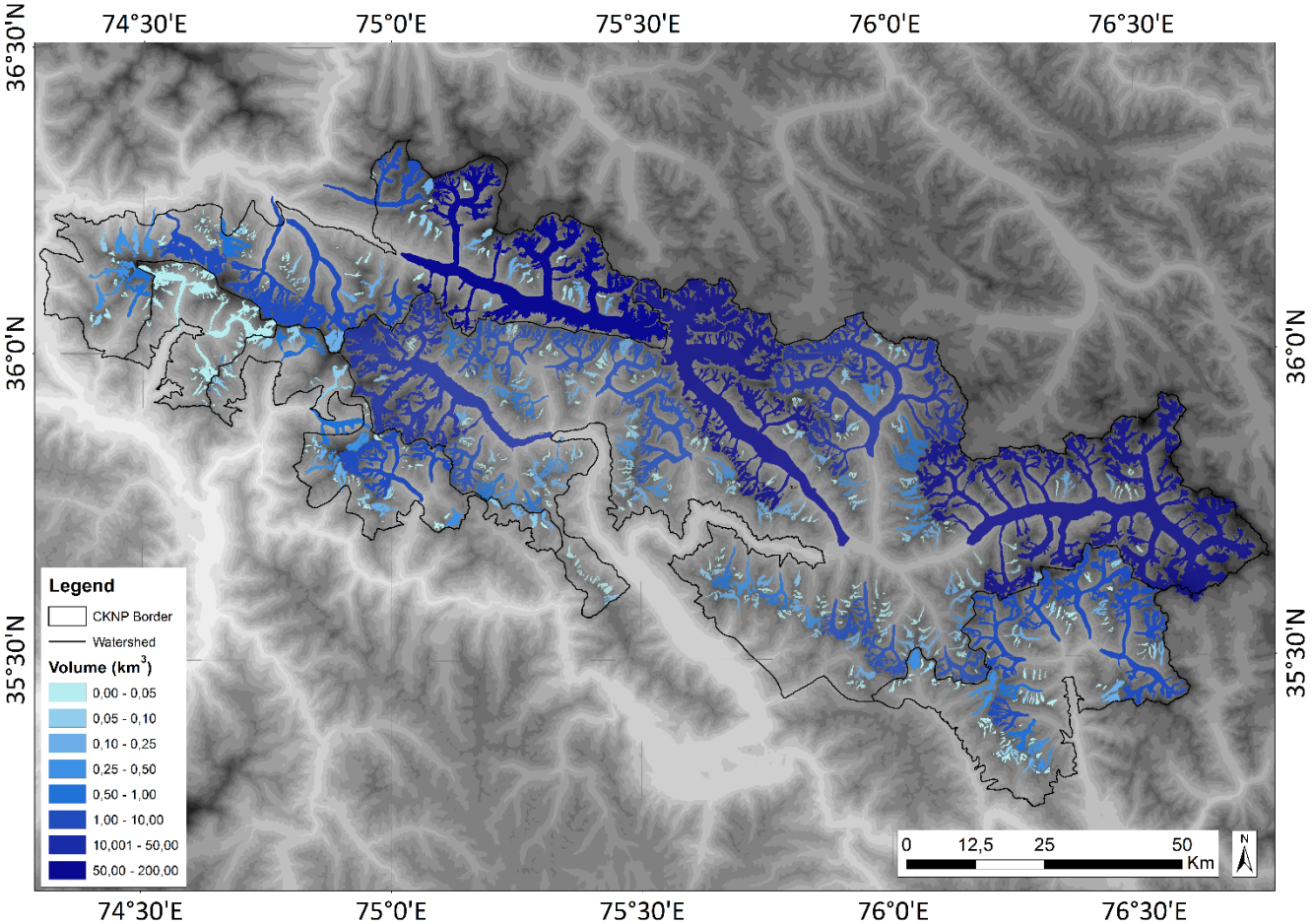

Fig. 2: Map showing the CKNP glaciers with information about the volume (km^3) corresponding to the total fresh-water resource contained in the CKNP glaciers.

Table 1. Summary of the inventory of glaciers and glacial lakes sorted into CKNP catchments.

Catchment	Area (km^2)	Number of glaciers	Cumulative glacier area (km^2)	Area of the widest glacier (km^2)	Glacier volume (km^3)	Volume of the largest glacier (km^3)	Cumulated meltwater in the time window 18 days long (km^3 w.e.)	Glacial lakes (number)	Glacial lake cumulative area (km^2)	PDGLs (number)
Shigar	6090	294	2308	604	392	129	0.92	109	2	0
Hunza	2099	123	766	369	98	70	0.35	57	1	0
Shyok	1224	94	335	67	27	7	0.13	30	0	0
Upper Indus	707	61	189	58	10	4	0.08	1	0	0
Gilgit	355	36	84	30	5	2	0.05	5	0	2
CKNP	**10476**	**608**	**3682**	**604**	**532**	**129**	**1.53**	**202**	**4**	**2**

GLACIAL LAKE INVENTORY AND PDGLS

In the CKNP area, 202 glacial lakes are located (Fig. 3) thus corresponding to about 7% on the total of 3044 glacial lakes listed for the Hindukush-Karakoram-Himalayan region (HKH). The park lakes feature a cumulative extent of 3.56 km^2 (Table 1, about 2.6% of the total glacial lake area in the HKH). Considering the lake type, in the CKNP the Supraglacial lakes prevail, they represent the 69.31% of the total number and they cover 2.04 km^2, then Blocked type lakes are abundant being 20.30% of the total number. The type distribution for CKNP gives a different picture with respect to the HKH general conditions. In fact, in the greater HKH region Erosion lakes prevails (857 water bodies, 28.2% of the total number), followed by the End Moraine Dammed lakes (791 water bodies, 26% of the whole number).

As in most cases major lakes are more susceptible of GLOF (Glacial Lake Outburst Flood) hazards than smaller ones, we analyzed lakes with a surface area greater than 0.02 km^2. The CKNP hosts 37 major lakes, corresponding to the 18.32% of the glacial lakes. Most part of these glaciers (64.86%) feature an area between 0.02-0.05 km^2. Overall 17 major lakes belong to Supraglacial type and 16 to Blocked type. In particular, only 2 PDGLs are found, both of them lie in the Gilgit catchment and are identified as supraglacial lake type (Fig. 3). These PDGLs have caused frequent flooding events in the recent past. In fact, the ephemeral lake developed at the surface of the Hinarchi Glacier possesses history of multiple breaching in the Bagrot valley of Gilgit basin. Also the other supraglacial lake in the Gilgit basin is growing rapidly due to melting of the associated glacier (i.e. Gargo Glacier) in the Bagrot valley thus posing threat of outburst flood hazard for downstream communities.

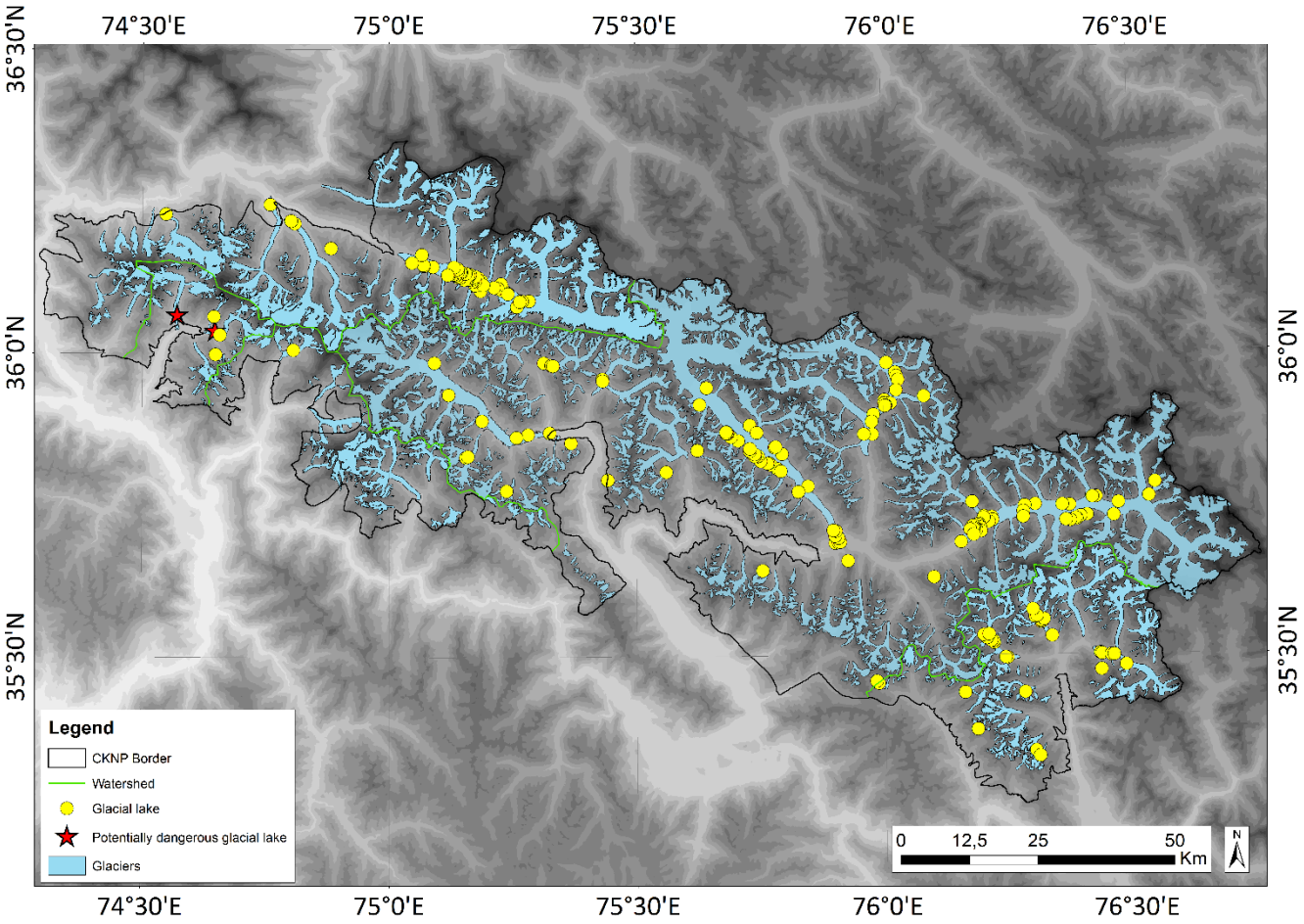

Fig. 3: Map showing the CKNP glacial lake inventory and PDGLs.

CONCLUSIONS

As regards the CKNP as a whole, 608 glaciers and 202 glacial lakes are found with a total area of 3682.1 ± 61.0 km^2 (~35% of the CKNP area) and 3.56 km^2, respectively. The total fresh-water resource contained in the CKNP glaciers was estimated ca. 532.37 km^3, with a maximum volume of about 130 km^3 (Baltoro Glacier). Analyzing in detail the five basins included in the CKNP area, they reflect the overall conditions regarding glacier distribution per size class, terminus elevation, and ice volume. The widest basin (for number of ice bodies, glacier extent and ice volume) is the Shigar basin, where the largest glaciers are present (among which Baltoro Glacier), and the smallest one is the Gilgit basin.

During 18 days in summer 2011, we quantified a total water magnitude of 1.54 km^3 derived from ice melting. Even if we considered a relatively short period, this water volume equals ~11% of the reservoir capacity of the Tarbela Dam (i.e. a huge hydropower plan located in Pakistan, 25,000 ha wide, 144 m high, 2743 m long and hosting a water volume of about 11 x 10^9 m^3). This value gives an idea of the role played by glacier melt in providing freshwater for Pakistan people (Fig. 4).

Fig. 4: People in the CKNP transporting giant glacier ice cubes to be used for deriving freshwater for civil use. This activity is performed daily in the summer season as most regions suffer dry conditions and limited freshwater availability.

In addition to glacier information, we provided glacial lake occurrence, as these ephemeral water bodies can develop into actual glacial risk conditions, which makes it important to list them and to survey them over time. The information reported in this study would provide base for future monitoring of glacial lakes and GLOFs and for planning and prioritizing disaster mitigation efforts in the park. In fact, even if the PDGLs identified in the park territory are only 2, they are located in a high vulnerable and fragile area and the recent history suggests us to survey over time these water bodies to avoid losses of human lives and destructions of villages and communities. Moreover, many other supraglacial lakes identified in the park area could develop into conditions of PDGLs thus suggesting to prosecute the lake monitoring and to develop early strategies for risk mitigations and disaster management.

ACKNOWLEDGEMENTS

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livelihood improvement and conservation through an integration of intrinsic scientific ecosystem management oriented research, indigenous practices for natural resource management and ecotourism principles to support the development and implementation of the CKNP. The present study was also carried out by early career researchers supported by DARAS (Department of Regional Affairs, Autonomies and Sport) of the Presidency of the Council of Ministers of the Italian Government through the GlacioVAR project (PI G. Diolaiuti).

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269 **NOMENCLATURE**

Symbol or Acronym	Meaning
CKNP	Central Karakoram National Park
PDGL	Potentially dangerous glacial lake
PARC	Pakistan Agricultural research Council
PMD	Pakistan Meteorological Department
HKH	Hindukush-Karakoram-Himalayan
GLOF	Glacial Lake Outburst Flood

270

SUSTAINING MOROCCAN OASIS AGRICULTURAL SYSTEM THROUGH SMALL MECHANIZATION INPUTS

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Sommario

Le oasi sahariane rappresentano un ecosistema artificiale che nei secoli si è dimostrato economicamente produttivo, nonostante il suo fragile equilibrio. Elemento portante è la buona gestione del palmeto che permette lo sviluppo di una struttura a tre livellie un microclima favorevole all'agricoltura.Questo ecosistema va oggi incontro a una progressiva degradazione, causata da fattori climatici, economici, sociali. La mala gestione del palmeto, causata dalla mancanza di risorse umane e materiali, è la causa principale del collasso dell'intero ecosistema.L'introduzione della piccola meccanizzazione può rinvigorire il sistema agricolo locale e rappresentare un fattore di attrazione per i giovani verso questo settore.

Abstract

Saharan oases are a highly artificial ecosystem that has proved to be economicallyviable for centuries, despiteits'fragile equilibrium. The pillar of this ecosystem is the good management of the palm grove, which allows the establishment of a three-layer structure and of a microclimate favourable for agriculture. Nowadays oases ecosystem is at risk, endangered by climate changes and economic and social factors and the poor management of the palm grove,caused by lack of human and material resources,is the main cause of its' collapsing. The introduction of small mechanization can provide tools to invigorate this farming system and attract young people in the agricultural sector.

Keywords:

date palm, harvesting, light mechanization, 2-wheel tractors, migration.

Introduction

An oasis is in most cases an artificial ecosystem, that thanks to human intervention is capable of sustaining agriculture under arid climatic conditions, like the Sahara Desert. The traditional system requires some degree of collective management for plants, soil and water but has proved to be sustainable and productive for centuries. Usually an oasis has a 3-layer structure, where the palm

grove represents the most important element: date palms form the upper layer and protect from excessive insolation the fruit trees (figs, almonds, olives, pomegranates etc.) and the arable crops (barley, wheat, sorghum, alfalfa and various vegetables) of the two lower layers, hence contributing to the formation of a mild microclimate. A well-managed palm grove is vital for the maintaining the traditional oasis structure (De Haas, 1998).

Oasis systems have also a strong connection with animal husbandry, historically represented by trade relationship between sedentary and nomadic people. Animals grant food or traction force for transport, water extraction and tillage and produce manure to increase soil fertility and feed on the fodder produced in the oasis (figure 1).

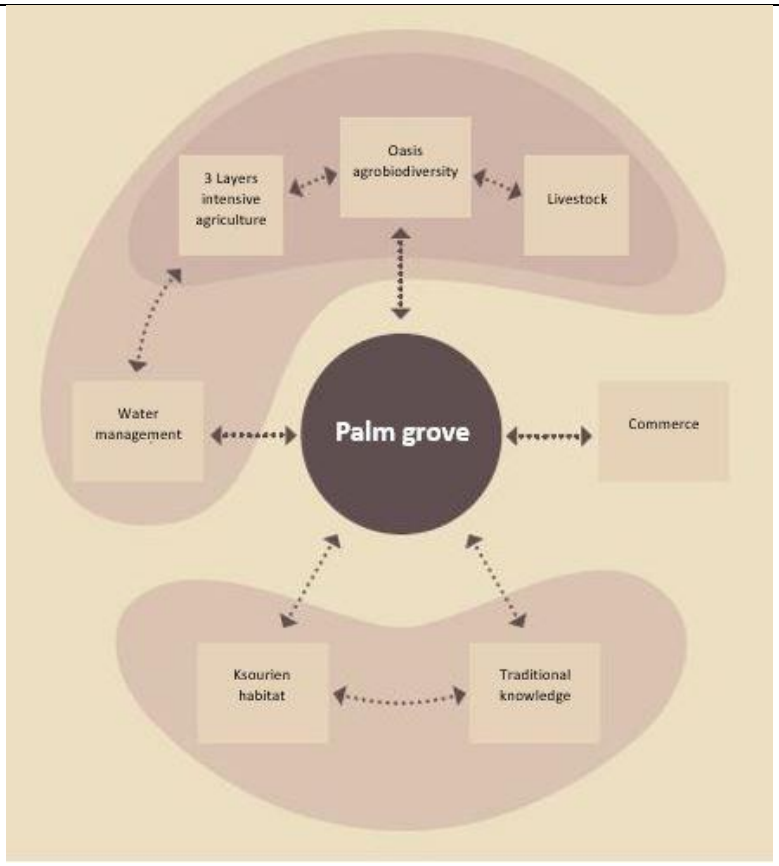

Figure 1 – Traditional oasis organization (Adps, 2015)

Nowadays, due to migration, socio-economic and political changes traditional oasis agriculture is in serious danger almost anywhere. Land use has become more extensive, in some cases fields are even entirely abandoned, and traditional common law is hardly enforced. The progressive degradation of the palm grove undermines the collective soil and water conservation measures,

provoking the collapse of the agricultural infrastructure, especially the vital irrigation systems (De Haas, 2001); figure 2 shows the reciprocal effects of criticalities and palm grove health.

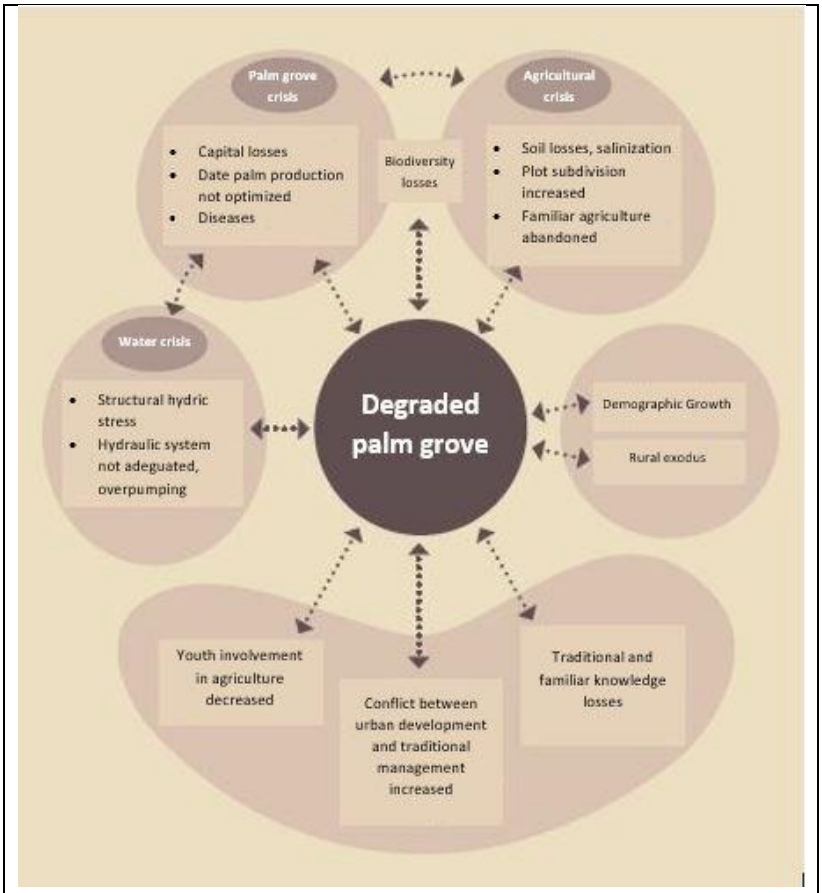

Figure 2 – Degraded oasis system (Adps, 2015)

In the Kingdom of Morocco many actions have been planned and implemented aiming to hinder oasis abandon and degradation, either by the Government or by other bodies, such as local administrations, international organizations, NGOs, cooperation agencies of other countries etc. This paper briefly describes the contribution of the authors based on the possibility of introducing mechanization in the traditional oasis farming system to increase labour productivity and reduce drudgery, hence allowing to make this neglected work more attractive and rentable.

This analysis is still in progress and has proceeded through a sound assessment of the actual situation, identifying constraints and potentialities, through a sound investigation on all what has been done or is on-going until now and through interviews to the main stakeholders of the Moroccan oasis farming system.

Oasis agricultural system and date production in Morocco

The analysis, that has not yet been completed, has been conducted through a review of some of the main programs implemented to sustain oasis economy in the last decade, together with direct interviews to various stakeholders involved in the oasis farming and date production in the main areas of south-eastern Morocco. A list of selected oasis and stakeholders is shown in tables 1 and 2.

Table 1 – Oases selected for survey and interviews

Name	Province	Region	Oued
Agdz	Ouarzazade	Sous-Massa-Draa	Draa/Zagora
Aoufous	Errachidia	Tafilalet	Ziz/Errachidia
Erfoud	Errachidia	Tafilalet	Ziz/Erfoud
Errachidia	Errachidia	Tafilalet	Ziz/Errachidia
Figuig	Figuig	Orientale	Zouzfana/Lakbir/Bouchlikhen
FoumZguid	Tata	Guelmim-Es Semara	Draa
Goulmina	Errachidia	Tafilalet	Gheris
Jorf	Errachidia	Tafilalet	Ziz/Erfoud
Lblida	Ouarzazade	Sous-Massa-Draa	Draa/Zagora
M'Hamid	Ouarzazade	Sous-Massa-Draa	Draa/Zagora
Ramlia	Errachidia	Tafilalet	Ziz, Rheris
Rissani	Errachidia	Tafilalet	Ziz/Erfoud
R'tbe	Errachidia	Draa-Tafilalet	Ziz
Skoura	Ouarzazade	Sous-Massa-Draa	Dades/Ouarzazade
Soul ElKhémis	Ouarzazade	Sous-Massa-Draa	Dades
Taamegroute	Ouarzazade	Sous-Massa-Draa	Draa/Zagora
Taghjicht	Tiznit	Guelmim-Es Semara	Boulgor
Tata	Tata	Guelmim-Es Semara	Draa
Tinghir	Ouarzazade	Sous-Massa-Draa	Todra
Zagora	Ouarzazade	Sous-Massa-Draa	Draa/Zagora

Originally this analysis was aimed at the whole date chain but, due to its complexity, only the field production phase has been taken into account in this first step, because it appears to be, at the present, the most critical one.

Moroccan oases are concentrated at the southern and eastern foot of the Atlas chain, an area that suffers less aridity, thanks to mountain rainwater and where many rivers drain into the desert. However, they make no exception in the global trend and they are severely affected by diseases, bad management and abandonment problems.

The structure of these oases is based mainly on date palm cultivation and arable parcels that are cultivated with alfalfa or cereals to be used as fodder; the second layer is mostly constituted by olive trees, scattered or planted in rows while other fruit trees are scarcely present. Fodder and olives are principally destined to self-consumption or anyhow are not considered important in the farming economy, while dates, even of the less valuable varieties, can constitute an important source of income.

Table 2 –Main stakeholders in oases farming system development (Auatif Chapron, 2015; Fratucello, 2016; Kradi, 2012; Pnud/Agense de l'Oriental, 2008; Programme de Développement Territorial Durable des Oasis du Tafilalet, 2010; Toumi, 2008; UN climate change conference Cop22, 2016).

Name	**Type**	**Description**
Agence de l'Oriental	Public institution	The agency's mission is to assist national and local subjects, sustaining the development of the Region Oriental of the kingdom.
Agence Nationale pour le Développement des Zones Oasiennes et de l'Arganier (Andzoa)	Public institution	A structure founded in 2010 and dedicated to fighting desertification and preservation of biodiversity.
Agence pour la promotion et le développement économique et social des provinces du Sud du Royaume (Adps)	Public institution	The agency's mission is to assist and coordinate national and local subjects in defining development strategies and accessing economic resources, in order to sustain the development of the southern area of the Kingdom
Agriculturalcooperatives	Cooperative	A wide range of collective organization: family

		cooperatives, production cooperatives, transformation cooperatives and service cooperatives.
Belgian Development Agency (Ctb)	Belgiancooperation agency	Active in southern Morocco with 2 projects concerning date palm: PaGie, supporting the Gie organization, and Safran-Dattes, a value chain analysis.
Centre d'Etude et de développement des territoires oasiens et désertique (Cedtod)	Association	A liaison center between research, Government services and farmers. Engaged in practical actions such as khettara rehabilitation and modernization, drop irrigation and other water provision methods development in oases
Direction de l'Aménagement du Territoire (Dat)	Public Institution	A branch of the Ministère de l'Aménagement du Territoire National, de l'Urbanisme, de l'Habitat, et de la Politique de la ville, in charge of development programs.
EconomicInterest Group (Gie)	Economicconsortium	A Gie is consortium of cooperatives created to gain a competitive advantage. Date Gies are a recent creation, not yet completely operative. They act mainly an interface with governmental institution, but provide also storage and marketing services for the producers.
Fédération Interprofessionnelle Marocaine des Dattes (Fimadattes)	Producersassociation	The federation represents producers from Ouarzazate, Figuig, Guelmin, Errachidia, Tinghir, Zagora and Tata, the most importat areas of date production. It acts as a Union towards the Government institutions and carries out coordination and training of associates.
German Corporation for International Cooperation GmbH (Giz)	Germancooperation agency	Works in Morocco since 1975 supporting projects about sustainable development, water harvesting, renewable energy, climate change, good governance and health. It is active in southern Morocco with 2 projects concerning

		oasis farming system: Re-Activate and Pedel.
Initiative Nationale du Développement Humain (Indh)	Public institution	Assists the Government in improving inclusiveness, accountability and transparency of decision making and implementation processes at the local level in order to enhance use of social and economic infrastructure and services by poor and vulnerable groups.
Institut National de la Recherche Agronomique (Inra)	Public institution	A public research institution for agricultural development. It has 10 regional research centers and 23 experimental stations in the different Moroccan ecosystems.
Ministry of Agriculture and Fisheries	Public institution	The Ministry is the most important subject, involved in almost all the main agricultural projects.
Office National de Sécurité Sanitarie des Produits Alimentaires (Onssa)	Public institution	The agency is involved in the sanitarian protocols for plants, animals and food products.
Office National du Conseil Agricole (Onca)	Public institution	In charge of piloting and coordinating the fulfillment of the national agricultural council strategies of on national scale. They are providingextension service to farmers
Office Régional de Mise en Valeur Agricole de (Ormva)	Public institution	An operational branch of the Ministry of Agriculture, it represents the Government on the territory and has an office in each region.

Moroccan date sector covers 48,000 ha of date palm plantations, encompassing 4.78 million palm trees. Producers are estimated to be over 200,000, mainly small-holder farmers, of which about 10% are organized into cooperatives. The main date producing regions in Morocco are Errachidia, Figuig, Ouarzazate/Zagora and Tata (figure 3 and 4), accounting for over 90 % of domestic production (App, 20xx).

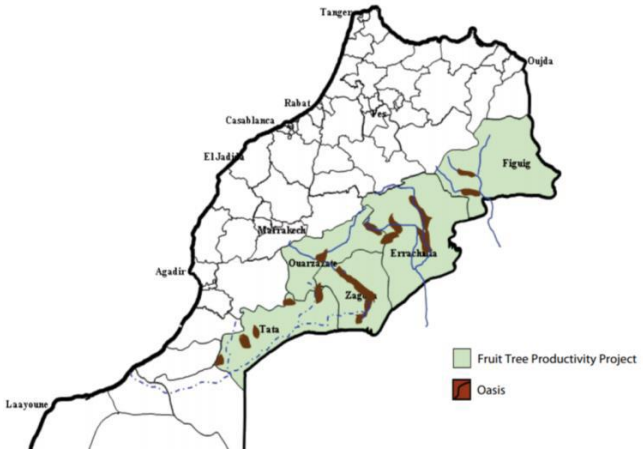

Figure 3 – Main area of date cultivation (App, 20xx)

Figure 4 – Palm groves in the Draa Valley near to Zagora

In the Drâa-Tafilalet region date producers are estimated to be almost 80,000 according to Ormva officers, while the hectares covered by palm groves are about 41,000, so the average surface for each producer is about 0.5 ha or less, considering the larger modern plantations recently set up by new investors. In Tafilalet only the average surface for each producer is slightly lower being about 0.4 ha (Ormvat, 2012). In intensive plantations palms are spaced about 8 m x 8 m, making the investment around 160 plants/ha, but in traditional groves palms are scattered and often intertwined while large fails are caused by aging or diseases making the average investment about 100 plants/ha (Ormvat, 2012). In this region, the average yield of a date palm is 29 kg/year (Ormvat, 2012), even if, depending on age, cultivar and management the yield can reach up to 200 kg/year.

Among numerous existing date palm varieties (223 are known while the unnamed hybrids, referred to as khalt, are estimated to be about 1,800); single producers normally have khalts in their groves mixed with some more precious indigenous varieties such as Bou-feggous, Bous-kri, Jihel and Mejhoul (App, 20xx), though many others are also appreciated by local consumers. In particular Mejhoul is considered very valuable and is, at the present, the most planted in Morocco, due to the high cost of its fruits. Mejhoul and Bou-Feggous are cultivated mainly as cash crops and plantations or single trees are usually well managed and constantly renovated.

Khalts are characterized by extremely variable characteristics, yield and quality; they are not much requested in the market, though often their abundance compensates for low prices, so they are never present in new plantations; they provide however a good integration in animals' diet and on an ecological and long term perspective they are very important because of their diversity and constitute an important genetic reserve. This is one of the reasons why maintaining the old groves alive has not only an economical and cultural meaning, but also a strategic importance.

Date production chain

Agricultural operations and management practices can vary, according to the kind of farm and to the structure of the plantation (traditional, specialized etc.), so not always what are considered the 'best practices' are applied. In some cases, farmers in traditional groves devote diversified attentions to their plants, depending on the variety, in other cases they do the minimum to keep plants alive and productive, while others devote to them all the care that is needed.

The main farming operations in date palm cultivation are listed in table 3 together with the technique most commonly used in Moroccan oases.

In general, there is a very limited use of machines, even if the reasons are different in traditional and modern farming systems. Traditional farmers usually are not willing to invest, having only a limited amount of land, and the subdivision in small plots, often scattered, makes it difficult for motorised equipment to move around easily. Modern plantations instead are mostly still in the initial phase, where trees are of small size and operations are done easily by standing or, in some cases, with the use of a simple ladder.

Table 3 – Farming operations for date palms as carried out in Morocco

Farming operation	**Management**
Soiltillage	Rarely done manually. Animal traction is used in small farms, tractor in larger ones
Fertilizing	Manually by spreading manure in smaller traditional farms, mechanized with use of mineral products in large ones
Irrigation	Ditches and channels in traditional groves, drip irrigation in modern plantations
Pruning of leaves	Manually by climbing the palm with ladders or belts
Pollination	Mostly manually by old men by climbing the palm, difficult to find young operators.
Cleaning of palm/trunk	When done is a manual operation, with the use of a chisel
Thinning of flowers	Rarely done in traditional groves, even for valuable varieties. Operators have to climb the palm
Fruitprotection	Rarely done in all environments. Operators have to climb the palm
Spraying	Almost never done. When done must be mechanized
Harvesting	Always manual, done by climbing the palm with ladders or belts

Identified problems

The following are the main problems that have emerged from the survey and from literature review (Kradi et al., 2002).

- Bayoud disease: it is perceived as the main problem by farmers and institutions, responsible of the destruction of the ecosystem of many oases, has caused the depreciation of many groves and discourages investments.
- Lack of water and salinity: water availability represents a big problem for the region. Some traditional farmers still use irrigation channels fed by the old khettara system, but almost everyone has a well with solar pump as back-up. The increasing number of wells and irrigation basins set up without a clear regulation could represents a future threat for the sustainability of the aquifer.
- Poor management and lack of optimization of water resources for irrigation

- Lack of interest and caution by young generation: young people are not interested in agriculture, especially considering the risks of traditional farming system for the management of big palms.
- Financial resources: almost everyone laments the lack of money to invest.
- Lack of specialized workers during the period of higher need.
- Need for time taking and laborious operations, sometimes dangerous (climbing), that are often not worth doing.
- Poor logistic for transport and marketing: this is especially true for remote rural locations. The road network is inadequate and the connection with important marketplace is limited.
- Degradation of groves caused by desertification (depending on the area): the advancing of sand erodes year by year more surface (figure 5) and farmers spend a lot of energy in trying to control it and often react by planting new plots farther, but the new ones are specialized and there is loss of biodiversity;
- Low quality of dates and processed products due to the lack of appropriate equipment.

Proposal

Traditional cultivation practices are time-taking and tiring and discourage young people from taking up their parents' job. In other cases, plots have been inherited by persons who don't have agricultural skills and are busy with other works and don't find it convenient to hire labor for tending the groves, sometimes it is even difficult to find manpower. As a consequence, traditional groves are mostly abandoned or poorly tended, where the owners reduce to a minimum cultivation and just settle for what the plants naturally produce.

In this situation mechanization of all possible operations can provide a new incitement and make the field work more attractive for the younger ones thus valorizing their role, enhance labor productivity and skills and reduce fatigue considerably. In the case of climbing up the palms the use of motorized lifting devices would also have an impact on workers' safety. Mechanization of post-harvest and processing phases can also increase women engagement in date chain and should be subsequently taken into account.

Introducing mechanization in Moroccan oasis is technically and technologically possible though specific tools for palm cultivation do not really exist; when mechanization is used tools are mostly derived from other sectors. However, all stakeholders are acquainted with agricultural mechanization, being present in other well-known farming systems and tools exist for each one of the operations previously described.

Optimization of the working time and the valuation of the work of the young people and the woman by the mechanization.

Figure 5 – Advancing sand dunes

Introducing mechanization

In modern agriculture mechanization has allowed to increase noticeably work outputs, reducing work drudgery and, when correctly applied, protecting worker's health and increasing safety. However, one on the main limitations of mechanization remain the relatively high investment costs and the need for scale economy, which make it difficult to access by many farmers and particularly by smallholders. Increased power availability for farm work in most cases has some positive effect on productivity but its efficiency and consequently its convenience can be dramatically undermined by wrong or inappropriate choices that lead to poor agronomic results and higher costs due to underutilization, increased energy needs, premature wear-out and breakages. Mechanization interventions should be carefully designed taking in account adequacy, appropriateness of technological level, correct sizing and local infrastructure and, in case the action proceeds from outside, its acceptability by the farmers and their willingness to change the usual system. Adequate specific training is essential in both cases.

In the case of Moroccan oases farming system, as previously described, the most suitable mechanizing intervention appears to be the one based on light mechanization, which means small power equipment in the range of about 0.15-15 kW, such as 2-wheel tractors (motocultivators),

motorhoes and motocultivator-linked trailers. These machines are capable of operating nimbly within small plots with ditches and scattered palms and other tree crops or obstacles, performing the essential operations needed for rehabilitation and cultivation of groves, such as tillage and transport together with other important ones like ditching and mulching. These machines are simple to use and maintain and have some similarity with tools and operations for animal traction that is still widespread in this environment. Light mechanization also includes small size specialized equipment such as dumpers and excavators, mounted equipment such as sprayers and platforms (figure 6) and various tools (shears, chisels, chainsaws, shakers etc.) driven directly or indirectly (by electricity or compressed air) by the engine of the main machine.

A proposal for setting up a pilot unit is being drafted with the aim of testing 2 or 3 of these units in different areas in order to evaluate benefits and constraints of introducing small mechanization in Moroccan oases traditional farming system, together with its technical and economic feasibility.

Concerning these two last aspects it is possible to envisage that the cost and the working capacity of a set of motorized machines, even if composed by light equipment, would be rentable only when an area of about 2-20 ha is available, depending on the composition of the unit. Table 4 shows an example of typical cost and working capacity of a motocultivator, a trailer and a small self-moved platform.

Being the average property usually quite small, in the range of 0.4-0.5 ha as seen in the previous paragraphs, a complete set of equipment should be managed in a cooperative form by groups of farmers or by an independent contractor. In the first case cooperatives of farmers already exist in almost all Moroccan oases, but the limitation of this form of management lies in the lack of specific skills by the users of the equipment which in some cases needs specialized or at least expert operators; this brings to misuse and poor maintenance.

Figure 6 – Light equipment is affordable and can move nimbly even in tight groves

Equipment ownership and management by a specialized independent entity such as a cooperative, a NGO or other is a more modern solution were the operators are specialized and can assure the best use of the equipment together with correct agricultural practices. This kind of approach is taking place in many realities in DC, where smallholders need access to mechanization, and can take different forms, also adopting up-to-date technology and business models from other initiatives in industrialized Countries. This is the case of a start-up company in Nigeria that sells two-wheel tractors equipped with GPS and links farmers to owners through a cell phone text messaging system, another one in India that has set up an Uber-type service for hiring a tractor with a driver and a NGO in Zambia that leases equipment providing various services, including financial assistance and training, and an Airbnb style agricultural equipment platform which is being setup in West Africa (Cta, 2017).

Table 4 – Characteristics and costs of some machines suitable for use in traditional palm groves (source: analysis of Italian market carried out by the authors in 2016)

Type	**Power**	**Operation**	**Work characteristics**	**Cost**
Two-wheeltractor	10-12 kW	rotary tillage	workingcapacity ~50-100 m2/h	~5,000 Eur
Trailer*	-	transport	payload:~400 kg, speed:~5 km/h	~2,000 Eur
Self-movingplatform	9 kW	access to palm crown level for 1 operator	time for positioning, lifting and lowering: ~4 min	~30,000 Eur

* Driving wheels trailer (needs to be linked to a motocultivator)

Conclusions

Enhancing date production appears to be one of the possible actions for sustaining oasis economy and most public projects are aiming at this objective. Sustaining farmers' activity through light mechanization seems possible because of the need to reduce work burden and increase labor productivity; most of the farming operations can be mechanized deriving machines and tools from similar operations done for other crops, but economic benefits of mechanizing traditional palm groves are yet to be proved. However, the importance of preserving this environment as a cultural heritage and a reserve of date palm genetic material allows to imagine an externally support (subsidies) in case sustainability is not achievable.

A practical intervention can be designed by defining a pilot package and all the corollary actions needed for its successful application to be replicated and entrusted to selected specialized organizations in different areas in order to evaluate its advantages and possible problems. This kind of action would support the implementation of the governmental strategies as well as other interventions (e.g., of the international cooperation agencies), allowing to create a network of practice and to build new partnerships.

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DISABILITY IN PALESTINE: FINDINGS AND NEW PERSPECTIVES FROM EMANCIPATORY RESEARCH

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Sommario

Questo articoli presenta i risultati di due ER condotta in Palestina. Questo articolo ha un duplice scopo. Primo, l'introduzione della ER come metodologia basata su processi emancipativi e partecipativi in grado di produrre informazioni di alta qualità. La seconda è l'analisi delle forme di deprivazione delle PcD nella West Bank (Palaestina) in termini di accesso a una educazione inclusiva ed efficace. La ER era parte di due progetti implmentati dalle ONG AIFO e Educaid in cooperazione con Partner locali. La ER è stata condotta con il supporto del gruppo di rcerca ARCO dell'Università di Firenze.

Abstract

This paper presents the results of two ERs implemented in Palestine. The aim of this paper is twofold. First, to introduce ER as a methodology based on an emancipatory and participatory processes able to produce high quality information. The second is to analyze the deprivation of PwDs in the West Bank (Palestine) in terms of access to inclusive and effective education. The ER was part of two projects implemented by the NGOs Educaid and AIFO with the cooperation of Local DPOs. The ER was implemented with the support of the research group ARCO from the University of Florence.

Keywords:

Disability; Palestine; Emancipatory Research; Participation, Capability

Introduction

The WHO World Report on Disability (2011) indicates that Persons with disabilities (PwDs) account for 15% of world population. The existing body of knowledge on disability in developing countries clearly shows a linkage between disability and poverty and, more in general, between disability and multidimensional deprivation (Mitra, Posarac and Vick, 2013).Palestine is not and exception (Salti et al., 2013)with women with disabilities (WwDs) as one of the most marginalized groups in the society (Burnton, Sayrafi and Srour, 2013). Consequently, PwDsare a group explicitly

targeted by international development cooperation policies. In general, disability is directly addressed by the Sustainable Development Goals (SDGs) [I] as the inclusion of PwDs in development processes is considered a fundamental part of development itself (Grech, 2016).

The Italian international Development Cooperation with the support of the Italian Network on Disability and Development (RIDS)[II]developed a specific Action Plan through the participation of scholars, disabled people organizations (DPOs), non-governmental organizations (NGOs) and public institutions. The Action Plan and the relative guidelines were based on a twin track approach that is on the simultaneous investment in disability specific development projects and in the mainstreaming of disability in all the development cooperation activities (MAECI, 2013). The achievement of these objectives starts from inclusive planning of development initiatives and it depends on the availability of exhaustive information and data about the needs of persons with disabilities as well as about environmental factors (i.e. barriers and facilitators). It is worth to underline that, coherently with the SDGs framework, information gathering is a strategic area for the Italian development cooperation to develop policies. In particular, SDG 17 highlights the need of disaggregated data and information to monitor the inclusiveness and the sustainability of development processes in an effective and transparent way.There are different methods to gather information and data (Kanbur and Shaffer, 2007). Emancipatory research (ER) is considered one of the most innovative and inclusive approach to collect information on marginalized groups. The main point of ER is to let the members of marginalized groups to get the full control on the knowledge production process about themselves. In other words, the members of marginalized group (e.g. PwDs) become researchers while the professional researcher become the facilitator of the research process.

In the Palestinian context, the NGO Educaid, in cooperation with RIDS, implemented a set of activities framed in the projects "Particip-Action"[III] funded by the Italian Ministry of Foreign Affairs and Cooperation and *"Empowerment of DPOs promoting WWDs' rights in the West Bank"*[IV] funded by the European Commission. Both projects can be considered part of a long-term

[I] There are 5 SDGs explicitly referred to disability (namely SDG 4, 8, 10, 11 and 17) while "disabity" and persons with disabilities are mentioned 11 times in the SDGs

[II] RIDS is an innovative network formed by 2 NGOs (Educaid and AIFO) and 2 DPOs (DPI-Italia and FISH) with the main objectives of including the knowledge and the skills of relevant DPOs in development cooperation activities and of including PwDs in development projects (both as beneficiaries and as experts), granting them accessibility to the interventions.

[III] The full title of the project is "Particip-Action: partecipazione attiva e inclusione sociale delle Donne con disabilità in West Bank" (AID10186/Educaid/TOC)

[IV]*ENPI/2014/339-220 :* note that the Italian Agency for Development Cooperation was still not operational when the project was implemented. That's why here we talk about Italian Development Cooperation.

strategy aimed at strengthening the participation of Palestinian PwDs to the society with a strong emphasis on gender and intersectional discrimination.

Among the other activities, Educaid promoted two emancipatory researches involving women with disabilities and members of DPOs to foster empowerment at the individual level, to strengthen local DPOs and to increase the knowledge of disability-related phenomena in Palestine. In the long term, these activities should enable Palestinian PwDs and DPOs to implement an independent monitoring of the implementation of the Palestinian Disability Law (n.4 of 1999), of the United Nations Conventions on the Rights of Persons with Disabilities (CRPD) and of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). In the specific case of these researches, particular attention was paid to the inclusiveness of the education system.

Therefore, the aim of this paper is twofold. The first objective is to introduce ER asa methodology based on an emancipatory and participatory process able to produce high quality information on disability that are useful for the elaboration of policies and the planning of international cooperation activities. The second, but not least relevant aim is to analyzethe deprivation of PwDs in the West Bank (Palestine) in terms of access to inclusive and effective education.

All the activities included in the projects have been implemented by Educaid with the cooperation of Local DPOs (Aswat, General Union of Person with Disabilities, Stars of Hope Society) and the Italian Network on Disability and Development. The ER was implemented with the researchers ARCO (Action Research for Co–Development)[V] as facilitators and data analysists.

The paper is structured into five sections. After this introduction, the applied theoretical framework is presented framing the analysis in the wider debate on disability and development. Section three introduces the methodology of ER explaining how it was applied in this research. Section four presents the data collected during the field research by providing a description and an interpretation of the results. In the last section, the main findings are recalled and the most relevant implications in terms of policy and design of development interventions on inclusive education are given.

Approaches to Disability, Capability Approach and the UNCRPD

The definitions of and the approaches to disability has been changing over centuries even if different models of disability tend to coexist within the same society (Schianchi, 2012). In general,

[V] ARCO is an action-research center affiliated to the University of Florence (Italy)

it is possible to identify an evolution of the definition of disability that shifts the analysis from the impairment and from the a-normality of the PwD to the interaction between the person and the society\environment. In the so called social model of disability, disability is defined as a condition arising from the interaction between the person (with his\her unique characteristics) and the barriers\facilitators present in the society (Basaglia and Ongaro 2000, Oliver 1990 and 1996).

In recent years, the United Nations Conventions on the Rights of Persons with Disabilities (UNCRPD) approved by the UN General Assembly in 2006 provides a new biopsychosocial approach to disability based on the concept of respect of the human rights. In particular, it promotes the full and effective participation in society of every person with or without disability on an equal basis: the physical, mental, intellectual or sensory impairments should not represent an obstacle to the inclusive and participatory development of individuals and societies.

While moving from the definition of disability to the socio-economic analysis of disability, the Capability Approach (CA) firstly elaborated by the Nobel Laureate Amartya Sen (Sen 1992, 1999 and 2005) has often been used as theoretical framework (Terzi 2005; Mitra 2006a, 2006b; Nussbaum 2006, Biggeri et al. 2011).Sen's CA has been used as point of reference also to structure empirical analysis and evaluations of policies aimed at improving the wellbeing of PwDs (Biggeri et al. 2014; Mauro, Biggeri and Grilli, 2015).

CA focuses the attention on what a person can do and can be that is, in last instance to his\her practical opportunities and his\her space of freedom. In other words, disability occurs when an individual is deprived in terms of practical opportunities because of an impairment (Mitra 2006a). An individual with an impairment can be considered disabled if he\she has an opportunity set that is smaller than an individual with similar entitlements (i.e. the available basket of goods and services), living in the same context (family, environment, culture)and similar personal characteristics (excluding, of course, the impairment itself).

The role of education is fundamental: it has both an intrinsic and an instrumental value(Nussbaum, 2006, 2011). According to Sen (1992), education can foster public debate and dialogue about social and political arrangements. In this sense, education has aprocessual role, which enables PwDs to take part in decision-making processes within the household, in the community and even at national level. High quality education acts as an equalizer role through its empowering capacity and its redistributive role. Indeed, education is one of the main facilitators of functioning, through which children, including children with disabilities, are offered the opportunity to enlarge their space of activity and participation and to express their agency. From a cognitive point of view, critical

thinking, caring thinking and narrative imagination are considered logical, moral, and creative components of the higher-order faculties involved in democratic thinking and judgment (Nussbaum, 2006; Biggeri and Santi, 2012). Education has an interpersonal impact because people are able to use the benefits of education to help others as well as themselves and can therefore contribute to democratic freedoms and to the good of society as a whole (see Walker and Unterhalter, 2007). High-quality public education is crucial to the health of democracy (Nussbaum, 2006).

Besides the intuitive and direct linkage to the social model to disability, CA enriches the analysis by stressing the role of individual choices, values and preferences. The vector of achieved functionings should reflect the multiple realizability of the human being and should be the result of a process of flourishing (Nussbaum, 2006). Therefore, the analysis should be simultaneously focused on the achievements of the PwD as well as on the process leading to these achievements throughout individual and social empowerment. In a CA perspective, the active exercise of autonomy and choice (agency) has both and instrumental value (as it allows the person to achieve a functioning) and an intrinsic value.

The flourishing of individuals is shaped by conversion factor sthat are not only individual but, as in the social model, also collective and environmental. In these circumstances, the CA introduced new concepts and dynamics based on collective capabilities (Ibrahim, 2006) and the functionings of local contexts as a system (Biggeri and Ferrannini, 2014). Collective action and the functionings of the local systems are fundamental means to promote human development both at the individual and at the community level. These developments of the CA are central for an assessment of collective processes and of the degree of inclusiveness of PwDs in a society.

This cultural and intellectual evolution is linked to the practical promotion of rights of PwDs and, in particular to the elaboration of a global standard such as the UNCRPD [VI].As already mentioned, the UNCRPD embrace a new bio-psycho-social approach to disability based on human rights. Disability is defined as a condition that is verified when a physical, mental, cognitive or sensory impairment interacting with the context prevent a person from the achievement of a "*full and effective participation in society on an equal basis with others"*[VII]. The emphasis on participation clearly indicates that disability is not defined in terms of weakness and needs of social protection but in terms of human rights: a person prevented to participate to the society by the interaction between his\her characteristics and some forms of barrier is not a person who needs more services

[VI] Italy approved the CRPD in 2009 while the European Union did it in 2010. Nowadays, the convention has been signed by 187 countries while there are 172 state parties.
[VII] see CRPD, art.1

but, first of all is a person whose basic human rights are violated (Kayess and French, 2008). This powerful paradigm shift and the strong emphasis on the direct participation of PwDs are reflected in the enforcement mechanisms included in the convention. The UNCRPD establishes a twin track approach to the monitoring of the implementation of the convention where the active involvement of persons with disabilities[VIII] is directly required (Stein and Lord, 2010). On one hand, the governments of states party engage themselves to periodically report to the Committee of the Rights of Person with Disabilities about the implementation of the UNCRPD. At the same time, the UNCRPD encourages DPOs and more in general civil society organization to put in place an independent monitoring of the Convention that should be delivered to the Committee under the form of "shadow report".

As DPOs and PwDs participation to the monitoring process is a pivotal component of the UNCRPD structure, methods and procedures to enhance this it are strongly needed.

In the next sections, this paper introduces ERand its application can be applied as a tool to elaborate a truly participatory and high quality independent monitoring of the implementation of the UNCRPD through the direct involvement of PwDs.

Emancipatory Research

ER is an approach to research that falls under the broader category of participatory methods. Participatory methods, strongly popularised in the 1980s with the work of Robert Chambers (Chambers, 1983), led to a complex and wide review of the dominant models of research and fieldwork activities and contributed to cutting-edge understandings in particular for the analysis of social and economic development. Chambers' original contribution consisted in a vivid critic to the conventional surveys methods, which were characterized by superficial data collection and ethnocentric attitude of the development experts due to their standardized approach and their weak knowledge of the research subjects (Libanora, 2010). Through Chambers' critical point of view, the academic world began questioning about the mainstream research practices and interventions.

Focusing on participatory research, the intensity of participation changes across methods and approaches. From the mere idea of consulting people and sharing research results in the first forms of participatory approaches, in the 1990s, participation started being perceived as a process through

[VIII] See art.33.3: *"Civil society, in particular persons with disabilities and their representative organizations, shall be involved and participate fully in the monitoring process"*.

which the marginalized groups could influence the society and become more aware about their own condition.

ER represents the step forward: those who are involved in a ER process are not only expressing their point of view or facilitating the survey, but they also have the opportunity to gain the full ownership of the whole research process. In the emancipatory approach, through the acquirement of skills and expertise in research conduction, the research subjects lead all the research activities, from the decision of the research strategy to the results dissemination: the professional researchers become only a source of scientific support and a facilitator. This shift of power relations is determinant for the individuals in order to actively become part of the knowledge production and of the decision-making process for policies of their concern.

Through this approach, the marginalized groups of the society acquire specific knowledge for active participation and research implementation, developing awareness on their own social and economic conditions. Through critical discussion and analysis of the research questions, the participants become aware of their rights and of the structural causes of their oppression, elaborating practical solutions in order to improve their living conditions and becoming able to control the process of knowledge production on themselves. The strategy, moreover, has the aim to sensitise and empower communities and institutions, encouraging social transformation and inclusive policies.

The figure of Paulo Freire has significantly inspired the development of emancipatory approaches in development interventions. The action-research methods that he created have been experimented for the first time in the San Paulo's favelas. Starting from the 1960s, the Brazilian educator started to advocate a new critical pedagogy with his innovative theoretical elaboration. While working among the poor and the illiterates in the tough environment of the favelas, Freire began to embrace a non-orthodox form of liberation theology. Through the field experience, he started a process of popular education and awareness raising (that he defined "conscientisation") which during the 1970s has spread throughout Latin America. Starting from this experience, Freire (1968) supported the idea that marginalized people have analytical skills and should be enabled to investigate their own realities and reflect upon their living conditions. . Paulo Freire and Augusto Boal represent then the pioneers of this kind of methodology with their work in the educative domain (Justo, L., & MgSc, F. E., 2005). Similar attention has been devoted to the agency of the poor by the CA through the contribution of scholars that tried to combine participatory methods and Sen's concept of freedom (Frediani, 2010).

The historical development of action research had emancipatory intentions from the very beginning

(Boog, B. W., 2003). Action research and its participatory applications have been designed to improve the researched subjects' capacities to develop skills (including professional skills), improve the problem-solving attitudes, increase their chances of self-determination, and to gain more influence on decision-making processes thanks to a stronger control on knowledge production processes. Emancipation is thou strongly linked to the empowerment processes, as the self-awareness is a key condition for the achievement of equal opportunities and participation in the decision-making mechanisms of the society.

Moving to disability research, Oliver coined the term "*emancipatory disability research*" to refer to a radical new approach to research in the disability field (Oliver, 1992). Since then a big debate started about whether such an approach is a "*realistic goal*" or an "*impossible dream*" (Oliver, 1997).Many factors exclude people with disabilities from the decision-making process related to the policies that affect the quality of their lives. As specified by Barton, "*Research is a social act.*" (Barton, 2005 : 317) and, as such, it involves the interaction among a range of individuals and groups with consequent ethical, procedural and political issues. When it comes to social justice, equity and citizenship, the knowledge production cannot be viewed as neutral, and in the struggle for the inclusion the Academia has to deal with material and ideological barriers that impair a full participation of people with disabilities.

As observed by Barnes, the most important characteristics of the emancipatory disability research are "*the problems of accountability, the role of the social model of disability, the choice of methods, and empowerment, dissemination and outcomes*." (Barnes, 2003 : 3). In this approach, researchers put their knowledge and know-how at the disposal of PwDs and their organisations through non-hierarchical activities of data collection, analysis and dissemination that weaken the disabling power-relations of the traditional approaches. A pre-condition for the success of an ER process is the full awareness and acceptance by expert researchers of their supporting role (i.e. the limitation of their ego). According to the UNCRPD and the bio-psycho-social approach to disability, the right to be involved in disability research as crucial in order to enhance the quality of the research outcomes (Mercer, 2004).

A ER process is articulated on several steps:

- The identification of a group that will lead the research
- The identification of the research question that emerge from a collective analysis of the barriers on of the mechanism of deprivation

- The definition of a methodology that should be a virtuous compromise between the vision of the research group, the limits in terms of feasibility and the coherence with the research question
- The design of the research tool(s) such a s questionnaires, guidelines etc. The research tools should be designed taking into account accessibility issues.
- Data collection that should be based on the highest degree of involvement of the research group
- Data analysis and interpretation of the results
- Dissemination elaborated according to the political vision of the research group

Applying the slogan "*Nothing about us without us*" to the research is a challenging task but the development of an inclusive research culture, in which researchers with and without disabilities can share expertise and cooperate, is essential in the construction of a more accurate knowledge production and a more inclusive society. The emancipatory effect of ER can be identified in a long-term perspective after the research conduction and in a separate manner from the specific research outcomes (Oliver, 1997). The strongest become the political process of collective empowerment, the more it become unacceptable for PwDs and other marginalized groups to tolerate investigatory methods based upon exclusionary relations of research production: to challenge power relations within research processes is a first crucial step to challenge power relation n the society at large.

The Context

Palestine is a peculiar context. Large part of Palestine is still under military occupation and the National Palestinian Authority (NPA) is still very weak and barely able to elaborate and implement coherent policies (including disability related policies). The mobility of persons, goods and services within Palestine and toward the rest of the world is extremely difficult. At the same time, the development of the agricultural sector is made difficult by the political situation itself. Therefore, Palestine is characterised by a weak economy, high unemployment (28.4% in 2016[IX]) and a heavy dependence on international aid (with an aid/total expenditure ratio around 40%[X]).

This critical situation has a deep influence on the conditions of PwDs. According to the last available disability survey about Palestine (PCBS, 2011), disability prevalence is around 2.7%. The data clearly shows that the level of participation of persons with disability to the social and

[IX] Source: Palestinian Central Bureau of Statistics, 2016
[X] Source: Palestinian Ministry of Finance, 2011

economic life is very low. The access to job is very low: as a matter of facts 83.7% of Palestinian PwDs was not working at the moment of the interview. Irrespective of the kind of disability, the access to auxiliary devices seem to be a problem for a quite large share of persons with disabilities.

Besides material deprivation, several empirical analyses highlighted a stigmatized perception of disabilities among the Palestinian society leading to discrimination of PwDs in the daily life (Educaid 2014; Burnton, Sayrafi and Srour, 2013). The discrimination against WwDs is even more profound. Most WwDs in Palestinian society remain hidden and silent; their concerns are unknown and their rights are overlooked. They continue to live under the double burden of being person with disabilities and female. Prejudice continues to prevail within each category making women with disabilities one of the most marginalized groups in the society.

The multidimensional deprivation of PwDs is particularly relevant during childhood and access to education is a crucial part of these deprivation dynamics Access to effective and inclusive education is one of the central points of the UNCRPD: article 24 support the development of inclusive education systems with a central role for individualised support and for the principle of reasonable accommodation.As already mentioned, education has both an instrumental and an intrinsic value: access to education is needed to prepare PwDs to participate to society and to build inclusive societies (art.8 and art.16). The Italian development cooperation is specifically engaged in the promotion of inclusive education given the Italian expertise in this field (MAECI, 2015). Palestine too, through the signature of the UNCRPD and through its inclusive education policy (MOEHE 2015 and 2014), is formally engaged in the promotion access to education of Palestinian PwDs.

Access to education for Palestinian PwDs is still weak and educational outcomes are generally poor (Jones et al., 2016). The enrolment rate for students with disabilities (SwDs) is still significantly lower than the general one with more than one third of disabled people aged 15 and older have never enrolled in school (PCBS, 2011). Dropout rates are extremely high too (PCBS, 2011). Empirical analyses focused on the identification of barriers found that transportation, attitudes, accessibility of learning activities substantially prevent Palestinian SwDs from having effective access to education. Zaqout and Abu-Hamad (2013) underlined the role played by several barriers including both material (transport, economic resources) and non-material ones (aptitudes).

This framework interacts with the political situation whose consequences tend to hit SwDs more than proportionally. In general, the prevalence of post-traumatic stress among Palestinian students is high (up to 33% according to PCBS 2014).

Jones et al. (2016) underline that the lack of monitoring of the effectiveness of the inclusion Palestinian children with disabilities is of the most urgent problems. This paper will show how the direct participation of PwDs and of DPOs can contribute (through ER) to establish a monitoring and evaluation system of the inclusiveness of the Palestinian education system.

Two ERs, mixed methods: data collection and results

The analysis of these issues has been deepened through two ER where conducted in the West Bank from September 2015 to October 2016

The two ERs collected the information via a mixed methods approach. The implemented mixed method strategy was based on the use of qualitative methods to elaborate the research tools, on the collection of both quantitative and qualitative data and, finally, on the use of qualitative methods to deepen the interpretation of the results.

The first ER was a research based on the involvement of board members of 11 Palestinian DPOs[XI]. The participants to the ER process collected quantitative information about 100 schools with the objective of evaluating their degree of accessibility. The survey covered 7 governorates in the West Bank[XII]. These quantitative data have been combined with the qualitative data collected during the second ER. The second group of researchers was composed by WwD and the researchers implemented 3 focus groups with different selected targets, 16 life course interviews and 6 interviews to teachers with a strong experience concerning education of children with disabilities. In both researches, the two research groups were in charge for all the steps including data collection and data entry.

The development of the methodology and the interpretation of the results was based on a set of focus group discussions with the research groups facilitated by ARCO researchers, Educaid staff and Birzeit University. The information were collected by interviewing school staff members.

The quantitative survey covered elementary, intermediate and high schools including both mainstream schools and schools for SwDs.The questionnaire was structured in several sections so that each section corresponds to a dimension of inclusive education. The identified dimensions are:

[XI] GUPwD Hebron, GUPwD Bethlehem, GUPwD Ramallah, Stars of Hope, Rantis, Thalassemia, Friends of Disabled, Aswat, Deaf Union, Women and Society Center, Al Baseera
[XII] Salfit, Nablus, Bethlehem, Jenin, Ramallah, Qualkirya, Hebron

- environmental accessibility that is the possibility to reach, enter and move comfortably within the school;
- accessibility of learning activities (including the availability learning tools;
- inclusiveness of interpersonal relations within the school (relations with teachers and with peers).

5.1. *Main results and discussion*

The first step needed to have an accessible school system is the possibility to reach the schools. The relevance of this aspect is twofold. First, the choice of the kind of school is directly linked to ability to structure one's project of life. Moreover, the ease to reach the school provides an indicator of the inclusiveness of the society as it is directly linked to the accessibility of public transport etc. The interviewees were asked to describe how SwDs could daily reach the school if they live 10km far (i.e. a distance that cannot be easily covered by walking). Barriers seem to be particularly severe for student with mobility and mental\cognitive impairment. More often, the school can be reached only through private transport (taxi or private car). This kind of solution represents an implicit economic barrier.

Tab 1- How easy is to reach the school for a student living 10 km far from the school

	Kind of transportation		
	Impossible (%)	**Only private transport (%)**	**Public transport (%)**
Student who use a wheelchair	19	73	8
Student with visual impairment	10	67	23
Student with hearing impairment	5	47	48
Student with cognitive mental impairment	25	54	21

As concerns the possibility to get into the school, the entrance of 37% of the sampled schools is not accessible at all for students who are wheelchairs users while the entrance of only very few schools (10%) has environmental adaptation to favour the movement of students with visual disabilities. The problems of students who are wheelchair users are not limited to the entrance of the school. In fact, in only 6 schools out of 100 all the floors are accessible for students with a mobility

impairment. Toilet are effectively accessible only in 36% of sampled schools[XIII]. Very few schools (4%) have environmental adaptations to facilitate the movements of students with visual disabilities.

On the whole, the lack of environmental accessibility in the most part of the mainstream schools creates a huge challenge for the child and his family, that sometimes are forced to address their needs to special schools which are very few in the Palestinian territories.

> In special schools, the interaction among the students is healthy and based on mutual respect, and of course it depends on the students' personality. The mainstream schools should become more inclusive: for a blind child, for example, it is important to attend school in the neighbourhood, in order to avoid the unfamiliarity of the surrounding space and environment. (T.INT-ELEMENTARY-SPECIAL)

Safety procedures for student with disabilities in case of emergency are planned only in 8 schools out of 100. This is a critical point in particular in Palestine where the political situation makes the probability of emergency evacuation of schools and other public buildings is much higher than in other contexts (Affouneh, 2008).

The different needs of student with different impairments should be addressed by the education system by providing appropriate learning tools and strategies aimed at giving the right value to the resources and the potentialities of each students independently from his\her impairments. On this regard, the situation is characterized by clear criticalities. Only a minority of the schools (26 out of 100) is able to offer appropriate learning tools (e.g. books in braille or audiobooks) to students with visual disabilities. The situation for students with hearing disabilities is even more critical. Only very few schools provide an appropriate support (14%) while only 12% has at least one staff member who is able to speak sign language. The situation of students with mental and cognitive disabilities is characterized by an overall disappointing performance of the sampled schools. First of all, segregation is de facto practiced in almost one school out of two as students with mental and cognitive disabilities do not share at all the same classrooms with other students. This kind of situations witnessed by the personal experience of interviewees:

> I didn't like my school; I always ran away from school. I didn't feel accepted, the teacher used to get me out of class to clean the school yard and help our cleaning lady, or even clean the school's bathrooms. That's why I used to run away from school or hide on the school's roof hoping that the teachers and the principal wouldn't see me. (LCI-17-F-

[XIII] During the discussion, several DPOs underlined that in several school the accessible toilets are often out of order or are frequently used for storage so that they are useless for SwDs.

MENT).

Only 48% of the school provide personalized support for these students even if this support is often provided only for a part of the time spent at school. Only a minority of the schools is able to provide a resource room to foster the use of students with mental and cognitive disabilities (17%). The most worrying datum is the one about the elaboration of personalized learning plans. Only 12 schools out of 100 base their activities with students with mental and cognitive impairments on a global strategy elaborated by all the teachers involved in the education of the student. In other words, even the schools that are able to provide some kind of service often do not do it in the wider framework of a plan aimed at increasing and giving value to the capacities of the student.

During the elaboration of the questionnaire, the DPOs representatives underlined the need of collecting information about the participation of the students to all the activities organized in the school. Therefore, the accessibility of art classes, of computer rooms as well as to extracurricular activities (e.g. schooltrips, open days) is crucial to achieve an effective inclusiveness of the school system.

The collected information shows a not sufficient degree of inclusiveness of these activities in particular for students with visual disabilities and with mental or cognitive impairment while the opportunity to participate of students with hearing and mobility impairments is substantially higher. This difference is mainly due to the intrinsic characteristic of the impairments and not to the presence of a better support for students with a certain kind of impairment.

Tab 2- Accessibility of activities in the school

	Students having access to…		
	Art classes (%)	**Computer room (%)**	**Extra-curricular activities (%)**
Student with a mobility impairment	69	63	61
Student with visual impairment	32	28	61
Student with hearing impairment	72	69	81
Student with cognitive mental impairment	41	23	49

The quality of inter-personal relations within the education process is crucial both for educational achievements and as a component of education inclusiveness. The onset of a disability challenges the relational network of the person:

> I had a good relations with my friends, I visited them and did many activities together but after I had the accident they didn't contact me, so I was forced to make new friends. When I returned to school, it was difficult at the beginning, my mates didn't communicate with me. It took some time but later on they accepted me and also my teacher encouraged me to study hard. (LCI-28-F-VISUAL).

If the child has the chance to experience an inclusive and accessible atmosphere in school, the experience in education will have a positive impact on his psychological balance, on his social interactions and on the employment opportunities as well.

> I was really happy when I was at school, I was a good student; I used to study hard, I was never late to school and I used to wake up early and with full energy. I also loved my friends from school, and I am still in touch with some of them. I had a good relationship with my teachers, I used to hate weekends and holidays, because I knew I wouldn't see my teachers and my schoolmates. At that time I also took part to many extracurricular activities, and I really loved sport (LCI-45-F-MENTAL).

According to survey data, the behaviour of teachers toward SwDs is usually appropriate. What emerge from the survey is a widespread presence of "good will" teachers even if, at least to a certain extent, 74% of the teachers tend to perceive the presence of SwDs as a problem.

Tab 3- Teachers' attitudes toward disability

	Almost always true	**Usually true**	**Occasionally true**	**Usually Not true**	**Almost Never true**
Teachers shows empathy toward SwDs	41	46	10	1	2
Teachers try to do their best	32	33	29	5	1
Teachers are aware that education is a right for SwDs	56	31	8	4	1
Teachers do not pay enough attention to SwDs	2	12	18	41	26
Teachers tend to perceive the presence of SwDs as a problem	10	15	24	26	25
School managers are sensitive toward SwDs' needs	24	19	18	25	14

The perceived global ability of schools to provide an inclusive education presents the same kind of criticalities. The education provided by the schools can be defined more or less inclusive for student with mobility impairment in 60% of cases, for student with visual impairment in 45% of cases, for students with hearing impairments in 49% of cases. The case of student with mental and cognitive disabilities is totally different: only 20% of schools are able to provide a more or less inclusive education while in 48% of cases the education provided is defined as not inclusive at all. The results from life course interviews are coherent with this framework:

> When I went to school, I felt that I was left behind, the teachers didn't accept me, so they didn't make any effort to let me participate in class or to explain me the things I couldn't understand. I felt that I was different than the others: many other children didn't want to play with me and they even used to make fun of me. The school has not been cooperative with my disability, the principal used to call my mom every day and to complain about me. Fortunately, my mother decided to take me out of that school. (LCI-17-F-MENT).

The relation with peers is not devoid of criticalities. In 58% of cases the interviewees report the more or less common presence of dynamics of discrimination of SwDs. In 38% episodes of violence are reported by the interviewees.

Despite this not totally negative picture, the interviewees reported that only 20% of the schools have more than 2 teachers appropriately trained to deal with SwDs while in 1 school out of 4 there are no support teachers at all. In practice in 80% of the schools less than 10% of teachers received a training on disability. The training of teachers seems to be a priority. It is interesting to remember that, in last instance, teachers are the medium of all the improvements that can be introduced in the education system. As emerged in the following interview, the behaviour of teachers can create dynamics of exclusion and segregation that are not justified by the absence of assistive devices or by not adequate infrastructures but by the lack of a human rights based approach to disability:

> The situation worsened because of my hearing disability. I preferred to sit in the first rows to hear better the teacher but, as I am tall, the teacher moved me back. This prevented me to follow the lectures as the others (LCI-18-M-HEAR).

Moreover, considering las three years 68% (73% if we consider project promoted by the Palestinian Ministry of Education) of sampled schools didn't participate to any structured project concerning disability. Finally, only 23% of the schools established a special unit on disability to coordinate and

monitor current the activities and elaborate a strategy for the future. In other words, the ability of the school to include SwDs is largely left to the "good will" of staff members without providing nor appropriate training, nor appropriate planning, nor appropriate infrastructure. In this situation, to move away from an approach to disability based on charity to arrive to an approach based on human rights and on the bio-psycho-social model proposed by UNCRPD seems to be difficult.

Conclusion

The paper shows the potentialities of ER as instrument to get high quality information about disability and, in particular, as an instrument for policy design and evaluation with a focus on education and having Palestine and in particular the West Bank as an interesting case study

All in all, the two research groups were able to collect high quality information. Their involvement in the elaboration of the research tools and in the analysis of the collected data can be considered as a crucial source of added value for the overall design and implementation of the research. The main results (reported in the next paragraphs) presents interesting information potentially useful to plan future interventions as well as to monitor the implementation of the CRPD and of Palestinian disability-related laws. The increased capacity of the PwDs and of the DPOs involve in the two ERs is a crucial achievement and a chance of individual and collective empowerment.

The collected information can be considered a good starting point to analyze the inclusiveness of the Palestinian education system for SwDs. The overall picture identifies the lack of investments aimed at increasing the quantity and improving the quality of the available human resources (i.e. teachers and other staff members). Most of schools seems to lack of a vision of how to reach the highest possible level of inclusiveness: the lack of a special unit on disability and of personalized learning plans in the large majority of schools is a clear indicator of an approach to disability largely based on improvisation and on good will rather than on planning.

The lack of infrastructure aimed at fostering the participation of students with disabilities is another problem stressed that emerge from the data analysis. The overall endowment of accessible rooms and learning tools as well as of basic services (including toilets) is not sufficient at all. Anyway, the investments in this sense should be framed in strategy as to improve material infrastructure without a clear improvement in the quality of human resources is likely to decrease the effectiveness of the investments themselves.

The results point out the role played by the context: the education system is of course the pivotal component of the right to education but factors as the role of the family, the transport network etc. emerged as possible barriers to the development of an inclusive education for Palestinian SwDs. In this sense, the issue of right to education for student with disabilities should be addressed through an eco-systemic approach able to identify and involve all the relevant institutions in a multilevel governance framework.

The Hamletic doubt of the Palestinian education system concerns the short-term feasibility of an inclusive education compared to investments in "good" special education. Several experts seem to push toward the second option (Jones et al., 2017) suggesting that inclusive education is not an achievable goal in the short term. Therefore, these analyses suggest to invest in special education while preparing the ground for inclusive education through ad hoc actions. Our analysis tends to reverse the perspective: the data shows that the priority and preliminary challenge is to induce a cultural change. The presence of SwDs in mainstream schools is an engine of change as it creates the need of achieving change to meet real and actual needs. Joining the presence of SwDs with the independent monitoring of DPOs, it will be possible to furtherly strengthen the change process.

The research is not devoid of limits: the limited availability of time and resources and the concurrence between data collection and the Muslim fasting month of Ramadan had a direct impact on the number of interviews collected by the research groups as well as on the sampling strategy. The research design can be improved increasing the coverage of the data collection and expanding the ER to other fields.

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List of Acronyms

ARCO	Action Research for Co-Development
CA	Capability Approach
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CRPD	Convention on the Rights of Persons with Disabilities
DPO	Disabled People Organisation
ER	Emancipatory Research
GUPwD	General Union of Persons with Disabilities
MAECI	Ministero degli Affari Esteri e Cooperazione Internazionale
NGO	Non-Governmental Organisation
ONG	Organizzazione Non Governativa
PcD	Persona con Disabilità
PwD	Person with Disabilities
SDG	Sustainable Development Goal
RIDS	Rete Italiana Disabilità e Sviluppo
SwD	Student with Disability
WHO	World Health Organization
WwD	Woman with Disabilities

SESSIONE 3

IL RUOLO DELLE UNIVERSITÀ NEI PROGETTI GOVERNATIVI E NON GOVERNATIVI DI COOPERAZIONE

INTRODUZIONE

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1. La sessione è stata ideata per presentare alcuni progetti realizzati dalle Università in collaborazione con ONG ed organizzazioni governative, in particolar modo con Università locali, al fine di poter studiare ed evidenziare quale specifico ruolo possa essere individuato per le Università nell'interazione con questi attori della cooperazione.

   L'ordine di presentazione e l'analisi della sessione 3, ispirandosi al tomistico "*Omnetrinum est perfectum*", sono stati articolati utilizzando come chiave di lettura due particolari "triplette".

   La prima è rappresentata dalla strategia codificata dall'ONU come "***Triple Win***"[1]: i tre aspetti di crescita economica, sviluppo sociale e sostenibilità ambientale devono avanzare di pari passo, pena il fallimento di ogni progetto di sviluppo sostenibile.

   La seconda tripletta è quella sintetizzata dalle "tre esse" della cooperazione: **Strategia - Sinergia - Sostenibilità**. Si tratta di una articolata ma ben ponderata chiave di lettura pervalutare qualsiasiprogetto di sviluppo che miri adun successo duraturo: secondo questo peraltro ormai diffuso approccio, di ogni intervento si deve analizzare sia la rispondenza ad una strategia di largo respiro, sia la attitudine a stimolarela sinergia fra i diversi attori coinvolti (popolazione, enti locali, ONG, Università), sia infinela sua sostenibilità nel lungo periodo. Tre virtù che riposano a loro volta sulla idoneità del progetto adinnescare meccanismi di ownership ed empowerment delle comunità locali.

2. Le nove relazioni presentate sono state quindi raggruppate in base alla loro peculiarità di risposta ad ognuno dei campi costituenti la "Triple Win".

[1] UN General Assembly Resolution 66/288, 27 July 2012, "The future we want"

Crescita economica

Lo studio sulla ***filiera di produzione delle noci di anacardio***(1) in Sierra Leone evidenzia come la scarsità di cibo dipenda anche dalla scarsa produttività e inefficienza del settore agricolo e alimentare, da cui la necessità di promuovere colture con più alto potenziale, per garantire un reddito duraturo ai piccoli agricoltori.

Lo studio di fattibilità di una ***Assicurazione sanitaria comunitaria***(2) in Uganda rivela come questa costituisca uno strumento innovativo per fornire una protezione finanziaria alle popolazioni rurali anche in presenza di emergenze sanitarie familiari e che, in base agli esiti dello studio, ha concrete possibilità di venire attivata.

La sfida della ***condivisione dei dati***(3) nei progetti di cooperazione è stata analizzata in uno studio che evidenzia come si renda necessaria una comunicazione diretta con il titolare dei dati, perché non si perdano molte possibili sfumature della ricerca.

Sviluppo sociale

Uno studio sul ***processo di pianificazione strategica in un ospedale rurale generalein Uganda***(4), condotto con analisi SWOT su fornitura di servizi sanitari, sviluppo istituzionale, rinnovo e manutenzione di infrastrutture, servizi di insegnamento e formazione ha consentito di delineare e comunicare la visione strategica dell'ospedale per i prossimi anni, evidenziando come la *condicio sine qua* non per la sua realizzazione è rappresentata dalla sostenibilità finanziaria dell'ospedale.

Incorporato nel *migration compact*, lo studio su ***Servizi sanitari e attività artistiche per coinvolgere i giovani nella lotta alla migrazione irregolare in Etiopia***(5) ha studiato comesi possa prevenire la spinta alla migrazione clandestina promuovendo azioni di sviluppo locale, creando posti di lavoro, migliorando l'accesso ai servizi sanitari e organizzando campagne di sensibilizzazionee mobilitazione dei giovani entro le comunità.

Più strettamente clinico è lo studio volto a stimare l'***accesso all'assistenza nei pazienti affetti da HIV nelle comunità rurali del Mozambico***(6), associando a quelli clinici i fattori fisici e socio-culturali che influiscono sull'accesso alle cure per i pazienti HIV+.

Sostenibilità ambientale

Il coinvolgimento della comunità in un ***impianto di biogas a basso costo***(7) è stato studiato in una regione andina, dimostrando come una semplice attività di manutenzione e gestione programmata, in un processo ben integrato nel contesto sociale, promuova la cultura dell'economia circolare e della gestione integrata dei rifiuti, riducendo nel contempo leemissioni nocive in atmosfera e le correlate patologie polmonari.

La possibilità di una significativa ricaduta sociale nell'uso delle moderne tecnologie è stata dimostrata dallo studio sul ***Telerilevamento e la sicurezza del territorio nel Nord Kivu***(8). Dato che le dispute sulla terra sono considerate causa e fattore perpetuante del conflitto nella Repubblica Democratica del Congo, una precisa delimitazione della proprietà terriera mediante telerilevamento diviene un fondamentale fattore di pace.

Le **reti di produzione dei cibi locali**(9), in particolare del garri (tuberi di cassava) del Benin settentrionale, sono state oggetto di uno studio che ha evidenziato come queste reti siano influenzate dalle tradizioni locali sul cibo, da dinamiche storiche (struttura economica da tempo basata sul commercio del cotone), da aspetti sociali e da fattori geografici. La ricerca esitala riconferma del paradigma della "*food sovereignty*", fondata sull'interazione positiva fra sviluppo di reti produttive locali e sicurezza alimentare.

3. L'analisi dei programmi presentati, svolta alla luce delle suesposte chiavi di lettura, ha consentito di evidenziare come il **principale ruolo delle Università** – luogo privilegiato di multidisciplinarietà e confronto critico e costruttivo fra multiformi esperienze –sia quello di promuovere la mutua integrazione fra i diversi aspetti della strategia "triple win", ovveroeconomia, società, ambiente,e di fungere da catalizzatore per l'implementazione di nuove strategie di sviluppo, in sinergia con gli attori locali e nell'ottica di una solida sostenibilità futura.

   Tutte le relazioni, poi illustrate dai coordinatori nella sessione finale di sintesi, hanno reso evidente da un latoil consolidamento della presenza degli atenei italiani in progetti di cooperazione internazionale, sia per quantità che per qualità, dall'altro alcuni **elementi di maturazione** e di crescita delle Università nel campo della cooperazione Internazionale.

Tali elementirappresentano altrettanti punti di forza per l'intero sistema della cooperazione italiana allo sviluppoe possono sintetizzarsi come segue:

- capacità di interagire e intervenire non più solo a livello operativo (intervento a progetto) ma anche **strategico**, inerenti il *policy making*;
- capacità di **promuovere**, gestire e coordinare progetti originali nati dalla propria spontanea iniziativa e correlati alle tre missioni dell'Università (didattica, ricerca, "terza missione"), non più quindi solo "interventi a chiamata" sollecitati da attori tradizionali della cooperazione per sopperire a loro carenze di *expertise* o di capacità tecnologiche;
- capacità di sollecitare un crescente ruolo attivo assunto dalle **università locali** dei paesi di intervento e loro espressamente riconosciuto nella ideazione e realizzazione congiunta di progetti di vera "co-operazione".

Un'ultima importante osservazione risiede nel sottolineare come le stesse chiavi di lettura utilizzate per l'analisi della sessione 3 possano essere adottate per **ripensare la *mission* del CUCS** come luogo privilegiato per la sintesi e la valorizzazione di nuove esperienze di cooperazione, contraddistinte da una spiccata sinergia fra i diversi stakeholders governativi e non governativi. La tensione alla ricerca di una strategia comune, innovativa e multidisciplinare caratteristica della rete CUCS racchiude un potenziale strategico che l'Università italiana mette volentieri a disposizione dell'intero mondo della cooperazione internazionale.

1. Stefano Corsi, Luigi Orsi, Ivan De Noni and Francesca Mapelli, *Innovative development model: collectiveactions and social enterprises. The cashewvaluechain in Sierra Leone*
2. Maria Nannini, Mario Biggeri, Giovanni Putotoand Gavino Maciocco, *Programming interventions on Community HealthInsurance: a Feasibility Case Study in Uganda*
3. Marta Domini, Silvia Gibellini, Lavinia Difrancesco, Antonella Vidoni, Francesca Villa, Sabrina Sorliniand Mentore Vaccari, *The challenge of sharing data in cooperationprojects: cause for reflection*
4. Andrea Carlo Lonati, IlariaPolloni, Filippo Ciantia, Thomas Odongand Mirella Pontello, *Strategic Planning process in a general rural hospital: an experience at Dr. Ambrosoli Memorial Hospital, Uganda*

5. Carlo Cerini, Nerisia Da Nelola Mauricio Tique, Benedetta Rossi, Nigritella Brianese, Paola Zanotti, Paola Lanza, Bruno Comini, Silvio Caligaris, Lina Tomasoniand Francesco Castelli, *Estimated access to care of patients with HIV infection in rural communities in Mozambique*
6. Giulia Lanzarini, Stefano Bolzonello, Valeria Pecchioni, Micol Fascendiniand Marilena Bertini, *Servizi sanitari e attività artistiche per coinvolgere i giovani nella lotta contro la migrazione irregolare in Etiopia*
7. Francesco Roncallo, Elisa Ferrara and Alberto Traverso, *Community involvement in a low cost biogas plant in an Andean region*
8. Pietro De Marinis, Giacinto Manfron, Arianna Facchi, Giorgio Provolo and Guido Sali, *Remote Sensing and landsecurization in Nord Kivu, DRC*
9. Valerio Bini, *Local Food Networks and International Cooperation: a Development Project in Northern Benin.*

HEALTH SERVICES AND ART ACTIVITIES TO INVOLVE THE YOUTH IN THE FIGHT AGAINST IRREGULAR MIGRATION IN ETHIOPIA

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Sommario

Il progetto nasce dalla collaborazione tra le Ong italiane Ccm e Coopi, nell'ambito dell'Iniziativa di Emergenza dell'Aics per mitigare le cause della migrazione irregolare in Etiopia (AID10677). L'area di intervento è la zona Bale (Regione Oromia), particolarmente colpita dal fenomeno migratorio. Qui è stato avviato un ambulatorio *youth-friendly* presso l'ospedale di Robe, i cui servizi di salute sessuale e riproduttiva hanno visto un ottimo utilizzo grazie all'attivazione di un programma di educazione tra pari. Un gruppo di giovani è stato inoltre coinvolto in attività di sensibilizzazione ed educazione comunitaria sulla migrazione, che ha raggiunto oltre 21.500 persone tramite il teatro.

Abstract

The project stems from the collaboration of the Italian Ngo Ccm and Coopi. It is part of the Emergency Initiative (AID10677), financed by the Aics and aimed at preventing and controlling the irregular migration in Ethiopia. Area of intervention is Bale zone (Oromia Region), particularly affected by migratory phenomena. Adolescent and Youth Friendly Health Services were established in Robe Hospital and the accessibility to sexual and reproductive healthcare improved thanks to the involvement of peer-educators. Similarly, a youth group was empowered to become key actor in community education around migration issues, with over 21,500 people reached by drama performances.

Key words
Irregular migration, youth, reproductive health, art and peer education

Introduction

The project stems from the collaboration between *Comitato Collaborazione Medica* (Ccm) and *Cooperazione Internazionale* (Coopi), two Italian Non-Governmental Organization (Ngo) operating in Bale Zone of Oromia Region, where both have gained several years of experience in the health and livelihood sector respectively, working in close collaboration with the zonal and *woreda* (district) authorities.

The project is part of the emergency initiative, supported and financed by Aics, to mitigate the causes of irregular migration in Ethiopia (AID10677). The initiative aimed at preventing and controlling the irregular migratory movements by increasing the access to income generating activities among potential migrants, refugees and local communities; improving the living conditions of potential migrants and migrants, through the provision of multi-sectorial essential

services (i.e., wash, health and education); developing educative and informative campaigns about the migratory movements; and supporting the protection of vulnerable groups, women, returnees, children and youth in particular[1].

The project started in May 2016 and lasted 10 months. In the framework of the project, Coopi promoted local development and job creation actions, through income generating activities, whereas Ccm mainly focused on the health and education activities. A research on migration movements in Bale zone was also part of the project and managed by Coopi.

It is important mentioning that the present paper focuses only on the strategies employed, the results achieved and the challenges faced within the health and education activities managed by Ccm.

Background

Several studies underline that more development does not stop migration flows (Aics 2017). Migration is part of transformative processes of the world. A perfect substitution between human mobility, capital flows and international trade does not exist. These flows are complimentary and interconnected. In a development perspective, approaching the root causes of migration makes sense, but certainly does not lead to immediate migration reduction and control.

In this framework, the Italian government has decided to address migration and development as a priority action. At European level, the Italian government is supporting the improvement of policies aimed at contributing to the African development and, thus, to the governance of migration flows. In particular, the Italian non-paper Migration Compact (Italian Government 2016) contributed to the development of the new Partnership Framework (Ec 2016) and the establishment of the External Investment Plan (Ec 2016). All these events and processes lead to the need for research on the ground to better identify the role of the development cooperation on migration issues.

The emergency initiative, promoted by Aics to mitigate irregular migration in Ethiopia (AID10677), gave particular emphasis on the research on migration and its roots causes. Five different universities (i.e., Adigrat University, Makalle University, Wollo University, Oda Bultum University and Meda Walabu University) were involved on the issue and collected relevant data in their respective area. The researchers used a combination of quantitative and qualitative methods. A multidisciplinary approach allowed analysing information from diverse and complimentary perspectives. About 2,200 semi-structured and structured interviews were conducted to returnees,

[1] MAECI – DGCS (2015). Call for Proposals: Etiopia. Iniziativa di Emergenza in favore delle popolazioni vulnerabili, dei rifugiati, degli sfollati e dei migranti per contrastare le cause della migrazione irregolare. AID10677. Roma (Italy)

migrant families, potential migrants, non-migrants and community leaders, and 40 focus group discussions organised with mixed groups of stakeholders. The sample was considered statistically representative of local populations.

The results of the five studies confirm that the Ethiopian case is of particular importance because of the strong economic growth and the migration trends observed over the past decade in the country. Ethiopia occupies the 174th place out of 188 countries in the Human Development Index (Hdi) (Undp 2016) and it is one of the world's poorest countries. The country is classified as having low human development, but disaggregated Hdi values indicate that 2 out of the 11 regions have medium human development. Despite showing significant differences across the country, the data indicate that the country is slowly improving in the Hdi rank. The Country counts more than 92 million of inhabitants, mainly living in rural area (84%) (Csa 2013). The population is young (44% under 15 years old); 24% of people are women in childbearing age (Csa 2012).

The data shared by the Ministry of Labour and Social Affairs (Molsa) report about 460,000 legal migrants between September 2008 and August 2013. Among these, 94% were women domestic workers: 79% travelling to Saudi Arabia, 20% to Kuwait and the rest to Dubai and other countries. About 60-70% of Ethiopian migrants were estimated as irregular, either trafficked or smuggled (Aics 2017). It's extremely difficult to estimate the number of irregular migrants at local level, mainly due to serious limitations of the data collection system within the official services. However, all researches reported a general perception of an increasing number of irregular migrants towards Arab countries.

The studies confirm that irregular migrants are mainly young and primarily males, despite important percentages of female; both married and singles, and usually with skills and a low-medium education background. They belong to middle size families and are proportionally linked to religions and ethnical groups existing in the specific *woreda* (district). About one third of irregular migrants are female, working as housemaids in families of the countries of destination; whereas male migrants usually work as herdsman and workers in the construction and petty trade sectors, but also in illegal activities. A significant difference exists between male and female migrants: the first travel mostly through irregular channels, while the latter use relatively more regular ways.

Routes of migrants may be regular, irregular or interwoven. An interwoven route is practiced via regular way at the beginning, with the concession of tourist visas that, upon expiration, transform migrants in irregular stayers in the country of destination. The majority of Ethiopian migrants travel via irregular ways through illegal brokers, across the sea and usually towards Arab countries.

The five researches investigated the factors affecting the migration flow. Push factors appear to be the main drivers of migration: they include unemployment and underemployment, low salaries, scarce land accessibility and poverty in general. Economic factors are among those mainly reported by respondents, while local governance and political factors are mentioned only by few. A special role is played by the reinforce factors, which comprise not only brokers and traffickers along the journeys but also the same migrants and families, parents and peers.

The five Ethiopian researches agree on the analysis that migration improves the family's standard of life, but they all underline the scarce sustainability of the effect. As far as migrants send remittances, the families increase their livelihoods, creating a dependence linkage. When the migration experience ends, families return to suffer human insecurity. And the returnees consider the possibility to re-emigrate.

Based on the data of the Ministry of Work and Social Affairs, Bale Zone (area of intervention of the project under study) is one of the areas of Oromia Region with the highest rate of irregular migrants and returnee population from Saudi Arabia. In the first 8 months of 2015, a total of 1,144 people migrated from Bale in an irregular way: the majority were young male and 82% of them wanted to reach Europe. Their education level was rather high: 14% has a bachelor degree, 21% started University and 34% completed high school. The majority of migrants (79%) came from 7 *woredas*. According to the study conducted by the Meda Walabu University, the main causes of irregular migration from these *woredas* include poverty, low level of economic opportunity and lack of basic services, including the health ones.

The health system of Bale Zone (about 1.8 million [Csa 2013]) comprises of 4 hospitals (1 per 448,800 people), 84 Health Centres (1 per 21,400 people) and 321Health Post (1 per 5,600 people). Despite all these hospitals and health centres offer a variety of services none of them is currently able to provide specific service for the youth. Only few health professionals are trained to offer a quality service to youth and no facility is equipped with a fully dedicated space for this group. Adolescents and youth (classified into the group age 10-29 years) represent about 42% of the total population in Ethiopia (Fmoh 2016). They live a very critical phase of rapid physical, psychological and social development. They are exposed to new risk for their health (such as tobacco use and alcohol use, inadequate physical activity and diet). The sexual activity may start in this period, with the risk of exposure to new infections. According to the latest data, sexual and reproductive health problems remain the major causes of morbidity and mortality among adolescents and youth, despite intentional and unintentional injuries and mental health problems are increasingly becoming important (Fmoh 2016).

The lack of Youth Friendly services in Bale Zone hinders the easy access of this population group to the health system. The lack of dedicated spaces, as well as the limited privacy and confidentiality cause the youth not to access the health service at all. At the same time, for the lack of adequate services, it is not possible to have reliable information about the access of young people to health services. However, regional estimates indicate that young people access the health system much less than the average on the general population, especially in reference to sexual and reproductive health and family planning services (Fmoh 2016).

Objectives

The general objective of the project is to contribute to the improvement of the living conditions of communities populating areas with high migration movements in the South-East of Oromia Region. The specific objective is to mitigate the main causes of the irregular migration in Bale Zone, by promoting actions of local development and job creation, improving the access to health services and organising awareness campaigns, mainly addressing the youth in the community.

In the framework of the project, Ccm mainly focused on the goals pertaining the health and education of the youth. In particular, the project structure foresaw two main expected results that can be considered the main objectives of the present paper:

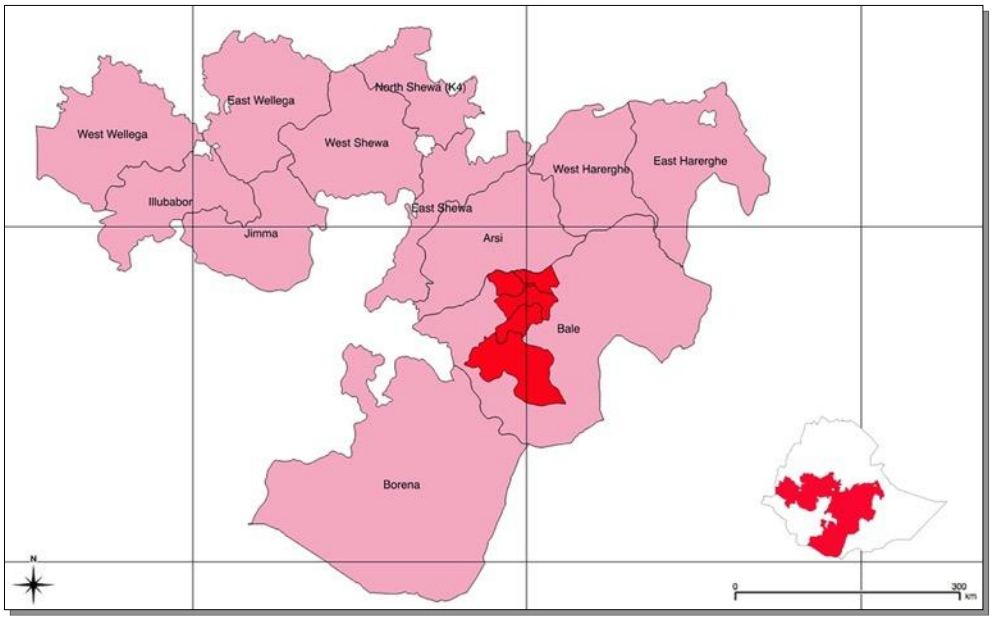
1) Improving the availability and accessibility of health services to young people, by establishing an Adolescent and Youth Friendly Health Service (Ayfhs) in Robe Hospital and increasing by 10% the accessibility to the Family Planning (Fp) and Safe Abortion Care (Sac) services;
2) Developing actions of community sensitisation and mobilisation about migration, by involving a group of youths into empowerment processes and making them direct actor of the education of their peers and communities.

Methods

The project was implemented in Bale Zone (Figure 1) from May 2016 to February 2017. Ccm employed a team of three technical staff (i.e., Project Manager, Health Officer and Community Officer) to follow the planning, implementation and monitoring of project activities. The team worked closely with Coopi staff to ensure a common planning and monitoring of activities and the maximum synergy across the different project interventions. A constant and close relationship with

local authorities, and in particular the zonal departments of health and of the social affairs, allowed the alignment of project activities with the local development plans and their integration with similar actions in the area.

Figure 1: The map of Bale Zone, with a particular focus on the area of intervention



The strategies employed to achieve the objectives are reported below. The main added value of the strategy is the participatory approach employed across all project activities. Despite their peculiarities and differences, the activities implemented to achieve the two expected results, in fact, have in common a high degree of participation of the final beneficiaries of the action, namely the youth.

Improving the availability and accessibility of health services to young people

- Creation of a fully dedicated space to provide youth-friendly health services. A needs assessment was conducted in Robe Hospital at the beginning of the action to identify the gaps in the delivery of youth-friendly health services. A questionnaire was purposely developed on the basis of the *National Youth-Friendly Health Standards*, to ensure a comprehensive evaluation of services as per the national guidelines. The assessment addressed the key issues related to service delivery, including infrastructure, human resources, equipment and supplies and information system. The needs assessment results allowed a proper planning of project activities, supporting the decision-making process that was led by hospital management and local authorities. The assessment was an opportunity to retrieve baseline data on the youth access to Srh services in the hospital.

- Training of health workers. Health workers were trained to enhance the provision of Ayfhs within Robe Hospital. Trainings focused on both clinical and methodological issues. The first trainings concerned the national guidelines, to ensure the consistent application of standards of services; whereas the latter mainly focused on the client-provider relationship, particularly important in the case of adolescent and young clients These, in fact, are usually reluctant to access the health system for the limited trust and confidence they have in the healthcare providers and in the local cultural environment, that limits an open discussion about sexual and reproductive health issues.
- Supportive supervision. Supportive supervision is a process to guide, mentor and encourage the health staff in improving services provision. Mixed teams composed of Ccm and health authorities were involved in the supervision, jointly revising the registers and documentation of care, directly observing the provision of services, discussing the challenges with the health staff and agreeing on an action plan for service improvement. A check-list was purposely developed to guide the supervision and ensure a standard collection of data at each visit to allow a regular assessment of the application of the recommended guidelines.
- Involvement of youth in peer education activities. Main hindrances of youth access to the healthcare system usually include poor confidence in the health workers, lack of privacy and confidentiality and limited knowledge of services provided. The direct involvement of youth in the promotion of Ayrhs was considered an effective strategy to increase the trust of young people in the health system. Young individuals, belonging to the target communities, already part of youth groups and showing good communication skills, were involved in training activities to become educators of their peers and promote the access to the AYFHS among their groups of origins.

Developing actions of community sensitisation and mobilisation about migration

- Capacity building of a youth group. The Club 20/25, a well-organised and active youth group in the town of Goba, composed of thirty youth aged 15-25, meets on regular basis around artistic activities, mainly focused on poetry, drama and dancing performances. The Club joined Ccm in designing the project proposal and was a key stakeholder in the community sensitisation and education activities. It was involved in the action as a beneficiary of a structured capacity building process, aiming at increasing its members' skills in preparing and implementing awareness and informative campaigns for their own communities.

- Involvement of a professional Company of Actors. The capacity building process of the Club 20/25 was carried out by a professional Company of Actors that joined Ccm in Ethiopia from Italy. The troupe involved the Club members in artistic and drama workshops aimed at developing a drama performance on migration, to stimulate the dialogue among adults and youth at village level.
- Community gathering to discuss risks and challenges related to irregular migration. Community gatherings were considered the most efficient and effective way to stimulate the dialogue about irregular migration. The project team moved across the 7 *woredas* targeted by the action (Agarfa, Berbere, Gassera, Goba, Gololcha, Robe and Sinana) and organised three specific meetings with local authorities, school pupils and the community at large, respectively. The Club 20/25 drama performance was used to open the floor and stimulate a successful discussion among the audience. Ccm Community Officer and representatives of the Labour and Social Affairs department at zonal level jointly facilitated and moderated the discussion.
- Documentation of migration stories. During each awareness gathering, individual testimonies of returnees were employed to discuss the risks and challenges of the irregular migration pathways with potential migrants. A sample of seven stories of returnees was merged into a booklet to be shared with the large public. Each story has been both written and illustrated, for illiterate people. The selection of experiences was jointly done by Ccm/Coopi team and the local authorities, to ensure these could be exemplary of problems and risks faced by migrants through their irregular routes.

Results

Overall, the project well achieved the expected results, in some cases even exceeding the set targets. Two staff, fully dedicated to the Ayfhs, ensured the provision of services for 5 days a week. The access to the youth-friendly Srh services established in Robe Hospital, exceeded the expectations: a total of 1,808 accesses were recorded over the first quarter of services operation (December 2016 – February 2017), well above the set target of 350; and the access to Family Planning (Fp) and Safe Abortion Care (Sac) services increased by almost 16% (target originally set at 10%).

The Club 20/25 was capacitated and supported in the preparation of a drama performance, which was showed in 14 community gatherings and 7 meetings with local authorities as originally planned. The participation to the events significantly exceeded the expectation, reaching 21,500 people (target originally set at 4,200). The detailed results of the project are reported below.

Improving the availability and accessibility of health services to young people

The Needs Assessment of Robe Hospital was conducted in July 2016. The results of the exercise revealed that the hospital lacks a space specifically dedicated to the youth, and adolescents and youths are forced to access the services with the general population. The main issues of concern refer to the lack or poor provision of education and counselling about sexual and reproductive health. Among the 71 nurses, midwives and health officers, employed by the hospital, only 2 (3%) are trained on the provision of Sexual and Reproductive Health (Srh) service to youth.

Ccm project team and the Hospital Management jointly decided to construct a room to be fully dedicated to the provision of Ayfhs, in agreement with the Zonal Health Office and in line with the basic standards recommended by the Ministry of Health. Not to delay the delivery of youth services, started in November 2016, an idle room available in the hospital was utilized for this purpose.

The new construction (Picture 1), was officially inaugurated on April 4th, 2017. The Ayfhs is composed of 3 rooms dedicated to the provision of: 1) Hiv Counselling and Testing services, provided as both Voluntary Counselling Testing (Vct) and Provider-Initiated Counselling Testing (Pict); 2) Antenatal care (Anc) and Family Planning (Fp) services; and 3) Safe Abortion Care (Sac). The space has been equipped with basic items and supplies to ensure the delivery of quality care. Since the launch of the service, Ayfhs are provided continuously for 5 days a week by two qualified and trained staff fully dedicated to it.

Picture 1: The Ayfhs within Robe Hospital

Ccm organised three training workshops involving a total of 26 health workers. The first training focused on the standards of the Ayfhs and involved 15 participants from Robe Hospital, two staff from each of the 5 Health Centres surrounding the hospital and a representative of the Zonal Health Office (to ensure a proper supervision of service in the long run). Trainees were selected mainly among nurses (50%), midwives (25%) and health officers (19%). The majority of trainees (69%) were women, to allow a better confidence in the management of sensible SRH services among young female clients (i.e., ANC, FP and SAC). The two trainers came from the Zonal Health Office of Bale and West Arsi. The training package, based on the Ayhfs National Guidelines, was designed to be interactive, to allow participants familiarizing and getting confidence with the tools and processes of the Ethiopian

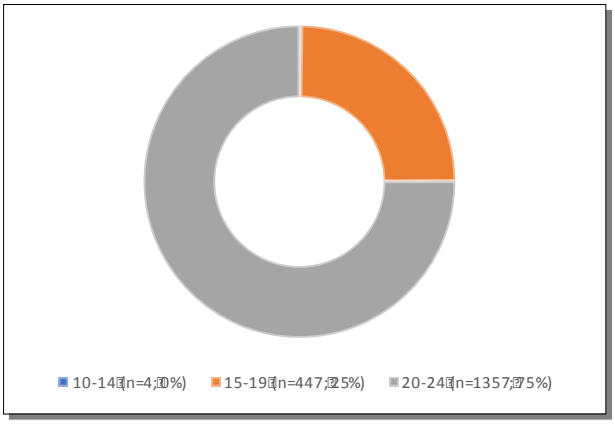
Ayhfs system. Training methods included a half-day field visit in Dinsho Health Centre, where Ayfhs has been working for several years. Pre- and post-test showed a significant improvement in trainees' knowledge (average class score moved from 52% to 84%).

The second training was organised for the same group of trainees and focused on Psychosocial support. The workshop trainer was a psychologist from Ciai, an Italian NGO partner of Ccm in a similar youth project in Tigray region. The training focused on the importance of the client-provider relationship. Trainees were highly motivated and interested to attend the training and demonstrated a good level of participation and understanding. They were directly involved in building a correct counselling approach, starting from their daily practices. The continuity of the two trainings (Ayfhs and Psychosocial Support) ensured the provision of a full package of knowledge and skills.

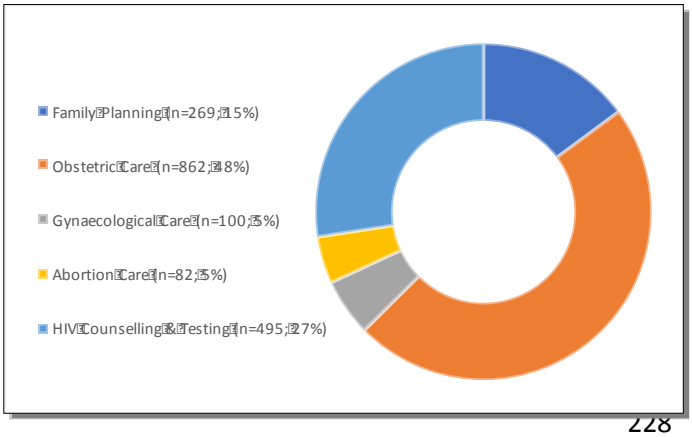
The last training focused on the management of the Sexually Transmitted Infections (Sti), with a special attention to young clients. Trainees were selected on the basis of the Needs Assessment results. A total of 16 participants attended the training, including five staff from Robe Hospital, two staff from each of the 5 Health Centres surrounding the hospital and one Ccm staff. The trainees were selected mainly among nurses (38%), midwives (31%) and health officers (31%). Trainers came from the Zonal Health Office. The training package, based on the *Sti National Guidelines*, allowed trainees to familiarise with the new protocols of the Syndromic Management of STI. At the end of the training the participants visited the newly Ayfhs established in Robe. Upon the completion of the health workers' trainings, 8 supportive supervision visits were conducted by Ccm team in the Ayfhs.

The analysis of data of the first quarter reveals that a total of 1,808 young clients accessed the service. Among these, only 73 (4%) were male and attended the Hiv service (either Vct or Pict). The remaining (96%) were female and received obstetric (Anc and safe delivery), gynaecological and abortion care, and attended Fp and Hiv services. Disaggregation by clients' age and service attended are reported in graph 1 and 2.

Graph 1: Access to AYFHS (3 months) by client's age



Graph 2: Access to AYFHS (3 months) by service



The Peer-Educator training (Picture 2) was organised with the main scope of empowering the youth from the community to take part in the sensitisation and the promotion of the Ayfhs among their peers. The training lasted 5 days and involved a total of 29 young participants and 11 adults (2 nurses and 9 teachers), with the main scope of establishing a linkage among peer educators and the Ayhfs service (nurses) and ensure the sustainability of the peer-education activities in the long run (teachers). The young participants were selected from the School Clubs, Youth Football Clubs and the Club 20/25. IFHP – international NGO based in Bale and with long experience in youth groups management – facilitated the training jointly with a trainer from the Zonal Health Office.

The training package, based on the *Peer-Educator National Guidelines*, was designed to be participatory and interactive. The main objectives of the training were to define the concept, the role and the practice of peer education and support the youth groups to develop knowledge, attitudes, believes and skills needed to engage their peers in healthy behaviours.

Picture 2: The Peer-Educator Training

Each group was provided with training materials useful for their peer activities on a daily basis. These were used to organise several education activities with their peers. Overall, the trained youth groups organised a total of 16 meetings with adolescent and young people living in the Robe and Goba surroundings.

Developing actions of community sensitisation and mobilisation about migration

Between June 2016 and March 2017, 20 members of the Club 20/25 took part in an empowerment and capacity building process led by the Italian Company of Actors '*Stradevarie*' and the Fekat Circus of Addis Ababa. The goal of the whole process was to equip the young members of the Club in the use of figurative art, music and education skills to better express their feelings and perceptions on a specific issue, and eventually facilitate the development of community education campaigns.

The process mainly focused on the provision of basic drama techniques in relation to the topic of migration and the youth were involved in the preparation of the scenography. Music and dance were integrated into the performance to allow the definition of a complete piece of drama ready to be

shown to the large public. Moreover, six members of the Club 20/25, joined the Fekat Circus[2] for two weeks in Addis Ababa, learning new artistic skills through the basic knowledge of circus arts, magic art and theatre-forum techniques.

Picture 3: A drama performance in robe town

The drama performance of the Club 20/25 (Picture 3), focuses on the risks linked to irregular migration, passing key messages through the narration of traditional animal tales. It was shown to the local authorities, prior being exhibited to the large public. The performance was shown in the 7 locations targeted by the project, where two events were purposely organized: one within the community at large and one at school level. A participatory discussion followed each performance, to allow members of the public sharing their personal and family experiences. The 14 performances allowed to reach a total of about 21,500 people (60% were women and 65% students of school-age).

In the same locations, 7 workshops were organised with local authorities, for a total of 179 participants who were asked to fill-in a short questionnaire regarding the factors inducing or preventing youth (and adults) to leave Bale Zone and migrate in other countries. The analysis of collected information indicate a combination of push factors, including the inadequate and inaccurate information about migration and lack of job opportunities in the area. The environmental and natural resources and the good living-conditions were recognised by the local authorities as the main factors to prevent people to leave the zone. The results were shared with the Labour and Social Affair Office, to support the organization of future community events on irregular migration.

Discussion and Conclusion

The project certainly achieved the expected results, establishing the Ayfhs in Robe Hospital and mobilising the community on the migration phenomenon and the risks linked to it. However, it is difficult concluding that the action actually mitigated the main causes of irregular migration in Bale Zone, mainly because of the limited time of its implementation and the extreme complexity of the

[2] Fekat Circus is an Ethiopian youth organisation that uses the circus arts as mean for community education and participation activities.

issue (spontaneous or forced movements of population have multiple causes). Indeed, the intervention stimulated an open-ended community discussion around the problems and risks associated with any irregular migration route, especially engaging the young segments of the community in dialogues and interchanges. Nevertheless, irregular migration is so long-dated and rooted in the target area, that multiple and longer actions are needed to effectively have a sustainable impact on the phenomenon. The theatre demonstrated to be a powerful tool to create a common discussion floor and stimulate the sharing of personal experiences.

The establishment of the Ayfhs in Robe Hospital is certainly a major success, as frequently reported by local authorities and the youth themselves. The service is a major added value for the health system of the whole Bale Zone: it is coherent with the national health development plans and in line with the national standards and guidelines.

The great attention provided to the youth group, particularly vulnerable in terms of health needs and particularly sensible to the irregular migration phenomenon, is among the main strengths of the action. The strategy employed allowed a high level of participation of youth, in both the promotion of Ayfhs services and the community education campaigns on issues related to migration. Despite not addressed in the present paper the combination of health services and community education activities, with actions of local development and job creation allowed addressing the issue of migration from different angles, promoting a stronger impact on the community and the youth in particular.

The main limitations of the action are certainly linked to the few months of implementation (10 months as per the project contract), that limited the effective and adequate supervision of project activities giving short time to health workers and authorities to fully and confidently own the newly established Ayfhs in Robe Hospital. Similarly, the time dedicated to the education and informative campaigns, already originally brief, was further shorten by Ethiopia critical political situation. The state of emergency hampered the smooth running of community activities, preventing community gatherings and thus the organisation of education campaigns on a large scale, as originally planned.

Despite the problems faced, over 21,500 people were reached with key messages on the risks attached to the irregular migration phenomenon and over 1,800 adolescent and young clients accessed the youth-friendly health services, in particular for family planning, obstetric care (Anc and safe delivery) and Hiv services. However, a close monitoring of the access to these services should be maintained over time, to assess whether the trend continues in the long-term and validate the excellent results achieved in the first months. Close monitoring and supervision of the newly

established services should be carefully carried on by the local health authorities, which have been purposely involved throughout the different project activities.

Acronyms

Aics	*Agenzia italiana per la Cooperazione allo Sviluppo*
Anc	Antenatal care
Ayfhs	Adolescent and Youth Friendly Health Service
Ccm	*Comitato Collaborazione Medica*
Ciai	*Centro Italiano Aiuti all'Infanzia*
Coopi	*Cooperazione Internazionale*
Fp	Family Planning
Hdi	Human Development Index
IFHP	Integrated Family Health Program
Molsa	Ministry of Labour and Social Affairs
Ngo	Non-Governmental Organization
Pict	Provider-Initiated Counselling Testing
Sac	Safe Abortion Care
Srh	Sexual and Reproductive Health
Sti	Sexually Transmitted Infections
Vct	Voluntary Counselling Testing

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THE CHALLENGE OF SHARING DATA IN COOPERATION PROJECTS: CAUSE FOR REFLECTION

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Sommario

La raccolta e gestione dei dati continua a rappresentare un problema importante per i progetti nei paesi a basso reddito. La raccolta dei dati richiede grandi investimenti, e nonostante gli sforzi profusi nella creazione di strumenti per la condivisione, resta ancora molto da fare a livello locale. I dati hanno un grande valore al fine di sviluppare strategie che portino ad uno sviluppo locale effettivo. Il CeTAmb LAB, sulla base della propria esperienza, propone una riflessione sul ruolo dell'accademia, basata sui principi della costruzione di competenze e condivisione della conoscenza, nel promuovere l'importanza di una corretta gestione dei dati.

Abstract

The collection of data and their management remain a never-ending challenge within projects carried out in low-income countries. Data collection requires high investments, and even if great efforts have been done in building tools for data sharing, these processes need to be improved at local level in developing countries. Data are valuable items for developing strategies leading to more effective local development. The CeTAmb LAB, on the basis of its experience, proposes a reflection on the role of the academia, which is based on principles of capacity building and sharing knowledge, in promoting the importance of data collection, conservation and sharing.

Keywords

Data management, sharing, reliability, access, cooperation

Introduction

The collection of data and the assessment of their reliability remain a never-ending challenge within projects carried out in low and middle-income countries. Developing countries are not only faced with the challenge of insufficient and unreliable environmental monitoring but also with the challenge of sharing such data and information (Michener, 2015). Data and information management is poor and disseminating data is still a challenge (Ndzabandzaba, 2015). The

collection of data, mostly technical and environmental but also economic, social and institutional, is of primary importance in order to design and develop sustainable technologies and systems. Data are valuable items, important for developing strategies and solutions within projects leading to more effective local development.

The collection of new data, and site-specific data, requires high investments in terms of time, human resources and money. In low-income contexts, even the collection of existent data pose significant problems linked to many reasons, among those: the lack of databases or of a reference institution; the haphazard contacts among non-governmental organizations (Ngos) or institutions working in the same area; gaps in communication and organization within local institutions; low importance given to data and their validation; competition and data property.

The paper would propose a reflection about these issues based on experiences of PhD students and researchers of the CeTAmb LAB (Research laboratory on appropriate technologies for environmental management in resource-limited Countries), which deals with strategies and solutions for waste and water management in developing countries. Based on our infield experience we are reflecting on our role in overcoming difficulties related to the collection and management of data in academic research in the context of international cooperation.

Difficulties in data collection and sharing

Projects carried out within the CeTAmb LAB are related to environmental management and appropriate technologies for waste and water treatment in developing countries. Depending on the nature of the research, the collection of different data is required. Data could be quantitative (e.g. chemical, physical and microbiological parameters of water or solid waste samples, water or waste flows, temperature, area, population, number of waste bins or latrines, etc.) or qualitative (hygienic behaviors, risk perception, cleanliness of streets, etc.). Data could be collected directly through on-site measures, analysis, observations, interviews, focus groups or questionnaires, or indirectly from publications, reports or grey literature.

New data collection

Many challenges are related to the collection of data in the field. When data are collected by the researcher, a problem we encountered is the language and the direct communication with the data

owner, in particular during surveys or interviews. Even with the support of local partners or translators, many nuances could be lost. As an example, during focus groups conducted with the communities of peri-urban wards in Tanzania, concerning household latrine realization, groups were facilitated by local partners speaking Kiswahili, with the support of a local researcher. Even if main points were summarized and translated into English for the researcher, information were partially lost in particular concerning technical details and it was difficult to answer to some of issues raised by the community.

Socio-cultural aspects, and local customs and traditions have to be taken into consideration, to avoid the risk of collecting incorrect data. There are information that could be considered as sensitive: as an example, in certain cultures to ask about the number of livestock units is equivalent to ask about the bank account in Italy. In others, women are not allowed to express an opinion different from that of men. In order to obtain congruent information on, as an example, water harvesting or collection, it would be necessary to dialogue with women in absence of men. Moreover, it is necessary to consider that it is possible to collect false positive information, as in some cultures the expression of a negative opinion is intended as an offence to the interlocutor.

Another issue emerged in our experiences concerns the quality and accuracy of data collected by others on the behalf of the researcher: even if a protocol is shared, it is difficult to assess the reliability of data when there are inconsistencies. Moreover, the lack of proper tools brings to further difficulties and risks of inaccuracy. For example in some projects in African countries (Burkina Faso, Tanzania and Mozambique) we faced the problem of the unavailability of laboratory sterilized containers for water sampling for microbiological analysis. We decided to use sealed mineral water bottles, to be emptied just before sampling, being careful not to contaminate any part of the bottle during this operation. If the operator does not respect such precautions, the results of microbiological analysis could be misrepresentative. Another difficulty is represented by power cuts, which are common in some areas, affecting the use of electrical equipment for samples storage and analysis (e.g. refrigerator, incubator).

Finally, there are areas which are inaccessible because of conflict or emergency situations where even local institutions and associations have not access. Projects carried out in those areas, as an example in zones controlled by Fuerzas Armadas Revolucionarias de Columbia-Ejército de Pueblo (Farc-Ep) and Ejército de Liberación National (Eln) in Colombia, would result in a gap of environmental data.

Reliability of existing data

Other sources of data are peer-reviewed articles, whilst an important source is the grey literature, which includes documents, reports, handbooks, thesis etc. produced from different actors and not peer-reviewed (Schöpfel and Farace, 2010) and even newspapers' articles. An issue is related to aggregated data: usually published or grey literature contains already elaborated data, and it is difficult if even not possible to access raw data. Information on how data have been elaborated or analyzed is sometime absent as well, making impossible their validation and with the risk of making inaccessible data and details useful for other projects.

Each of these sources has a different level of reliability, which should be assessed by double-checking information when possible, even if it is necessary to keep in mind the difference between levels of reliability.

In some low-income contexts, particularly in rural areas, the oral tradition is still important and recognized at community level even if, for us, it is not 'scientific'. Some information could be only obtained in this way, and could not be verified or assessed. Moreover, in some rural areas even official data from local authorities could be outdated and do not reflect the actual situation, especially when services as Civil or Land offices do not exist. The capacity and ability to cross check information and data in order to assess those that cannot be validated becomes fundamental.

Access to existing data

Another big challenge we encountered in data collection in our experience in low-income contexts, is the accessibility to existent data.

If difficulties in collecting reliable data are a recognized challenge in the sector, to obtain already existing data, previously collected by others, represents an additional difficulty, and often depends on the willingness of local partners (Strande at al. 2014). Based on our experiences in African and Latin American countries, more than once we struggled with the problem of finding or obtaining already existent data, which were collected by other Ngo or local authorities within previous or concurrent projects.

These problems come from different causes or a combination of them. Often data are not well managed and stored by the owner or responsible, and they are not consistent and well organized, but dispersed in different offices, or remain with consultants hired to do some research. Causes are to be

found in the change of reference person, the lack of structured systems for data storage, the lack of communication between different offices and actors of data collection.

As an example, during a project in Tanzania it was necessary to sample and analyze water from wells in the project area. After lot of time we could obtain the list of existing wells from the Municipality, but it was incomplete, due to the fact, as reported by Municipal officers, that usually people do not declare to have or to dig a well. The team therefore decided to search for wells in field, asking to the population and local leaders. It emerged that many of identified existent wells were realized within a previous cooperation project, but data about the location and characteristics of wells were not available at level of local and municipal authorities, while the Ngo did not work anymore in the town.

In another water and sanitation project in Mozambique, after discovering, during a survey in households, that another Ngo already performed a similar investigation some years before, we tried to contact the Ngo in order to have some information about it. Data were not shared because they did not have any more the project file folders in the local office and the reference person did not longer work for that organization, since the conclusion of that project.

In many low-income context, data are still paper-based and not stored in electronic form and this can affect data accessibility. Even if digital archives make easier to disseminate data, they do not solve automatically problems related to this issue, such as the physical location of the storage or the risk of loss. Moreover, in some contexts, hardcopy archives are more usable, as they do not need electricity or electronic equipment to be accessed.

The question of language, mentioned above in the paper, emerges again as an important discriminatory factor also for existing data. In our experience, we rely upon literature in English, French or Spanish. Even if English is recognized as common international language, it is not necessarily the only language in which we could find information in particular in low-income countries: we can think about emerging areas as China, South and Central America, and Arabic speaking countries. Discussing the language of scientific communication, Van Weijen (2012) shows as an indicator the ratio between the number of journal articles published by researchers in English to those in the official language of studied countries. Although only eight countries are shown, it is interesting to point out how this ratio varied from 10:1 in 1996-1999 to 2.5:1 in 2008-2011 in Brazil (the only country with a descending trend) and remained stable around 2:1 in China. As European

countries shown values ranging from 40:1 to 5:1 (reference period 2008-2011), the perception of a European researcher could be influenced by the abundance of paper in English, leading to the neglect of a huge amount of information. Still speaking about scientific communication, a reflection on cultural hegemony lies under the choice of the communication language.

At the local level, most data collected by authorities are available in local languages (e.g. tables with data about waste or wastewater treatment plants) and need to be translated. In Tulkarem (West Bank) a whole database on waste collected by the local waste management company was available, but all supporting information were in Arabic language. In such a case, a tight collaboration between a trusted local officer and the researcher is needed, in order to translate properly technical terms and definitions.

Data ownership

In our experiences we reflected about some risks and competition related to data property. Who has the ownership of data? The collector or the beneficiary? Who can use them and how? Does it exist a competition based on data accessibility, which could permit the owner to access to knowledge, results or funds that could influence their management? Ngos can have a role in promoting the importance of data collection and in enhancing transparency, as in the case of Tulkarem (West Bank). The local authority for solid waste management started to collect data at the beginning of a development project promoted by an Italian Ngo, as it was necessary for monitoring obtained results. In the final phase of the project, the access to the database was possible thanks to the strong relationship between local authorities and the Ngo.

Data from failures

Final results of a project are more likely to be shared if the project was successful, but what does it happen when a project or a single action of a project fails? Often, data collected under project actions that do not meet their target are not published nor shared. To our experience, negative results are scarcely reported in literature. This can be due both to a cultural approach in which errors and failures are not admitted, and to funding mechanisms of development cooperation, which reward successful projects. As a consequence, some of these data are likely not to be shared: managing data requires time and efforts, and it could seem meaningless if they are related to a project which has not reached expected results. Anyway, such raw information, even if partial or

"negative", could be useful for other practitioners or researches, as a starting point or just as a mistake not to be repeated.

Discussion

Our reflection, as young researchers at CeTAmb LAB, leads to recognize that scarce importance is given to data collection, accessibility, management and sharing in many low-income contexts.

One of key points of reflection concerns the role of academics and researchers working within international cooperation projects in increasing the awareness of projects stakeholders about the value of data and consequently data management. At the beginning of each new cooperation project in which we will be involved as researchers, it should be important to promote the creation of a policy of data management and sharing, in which all partners and project beneficiaries have a role.

At a local level, institutional partners' needs to be involved and trained in this process, to make sure that data are understood, safely and systematically collected, stored, shared and updated. Storage methods have to be developed together with local partners and adapted to their skills. Another important action we are already undertaking, is to establish contacts, when possible, with local universities in order to create partnerships and data sharing between universities in Italy and in low-income countries.

As observed, the willingness and low awareness are not the only reasons impeding data acquisition and sharing. There are situations in which is not possible to exactly follow procedures, or respect monitoring plans or guarantee correct sampling and measures, due to economic constraints or unavailability of adequate tools. We would like to stimulate within the academia and practitioners of the sector a reflection on methods and strategies to adopt in these situations. On one side, it would allow to anyway get environmental information; on the other, it would build skills for 'data collectors' in low-resources contexts. Once data are collected, it should be necessary to build and support strategies, tools and methodologies for their management. These should be encouraged and implemented at local level, involving and sensitizing local officers and data owners, but also at research and academic level, developing strategies for data sharing, accessibility, validation, preservation and transparency. Data should be collected and stored in a clear form to be accessible and comprehensible by others, with particular attention to raw data which could be used for other elaborations.

International NGOs and aid agencies are doing great efforts in building tools and platforms for data sharing and to increase transparency.

We can cite as an example the site of World Health Organization (Who, http://www.who.int), containing a huge amount of data and statistics on health from all over the world; the site Aquastat (http://www.fao.org/nr/water/aquastat/main/index.stm), Food and Agriculture Organization's (Fao) global water information system, source on global water statistics, or the Waste Atlas, which represents a crowdsourcing free access map that visualizes municipal solid waste management data across the world (http://www.atlas.d-waste.com/). At academic level we can mention the DaBaCU, an online platform promoted by the Coordination of Academic Cooperation of the Dgcs-Maeci with Italian universities, aimed at creating a community and an opportunity of sharing and exchange knowledge and experiences. Networks are important tools for accessing and sharing information about initiatives already carried out in similar areas or concerning similar themes. Such an approach could support also the acquisition of site-specific data.

While from one side data sharing and open access data should be at the base of advancements in knowledge and development for low income countries, on the other hands some risks could occur. Data can be used improperly, as pointed out also in Michener (2015): an example could be the use of geographical information for both social control or crime in areas with social conflicts (e.g. favelas), as well as the use of geological data for identifying the presence of precious metals, in those cases in which exploitation has a negative impact.

Reflecting on free sharing of data, soon our thoughts turn to the intellectual property concept and on the risks in the dissemination of data. The introduction of a specific formation of PhD students about these issues would be promoted within the CeTAmb LAB.

It would be also interesting to valorize data collected within projects which did not reach their goal, or even the experience with collection procedures showing weakness. In fact, in development cooperation projects Trial & Error is a common process, which demonstrates the capability to recognize errors and modify project choices, but it is often understated. Research on development cooperation, and development cooperation itself, will benefit from a proper confrontation on failures.

The academia is based on principles of capacity building and sharing knowledge and could play an important role in data sharing. Universities should reflect and invest part of their efforts in

promoting the importance of data collection, conservation and sharing, actively developing solutions and tools for it. At an academic level, CeTAmb LAB ongoing reflection is leading to different proposals for stimulating the accessibility and sharing of data and information for researches in international cooperation. Communication channels would be a periodic newsletter, the promotion and support of conferences and training in countries where we are involved, the organization of conferences and meetings to strengthen networks at a local level in Italy, the use of existing tools and databases to disseminate its activities and researches.

Conclusions and way forward

The acquisition, validation, storage and sharing of environmental data in low income countries pose a series of difficulties at research level. Young researchers at CeTAmb LAB started a reflection about this theme based on their experiences in low-income contexts, recognizing the important role the academia could play in highlighting the importance of data correct management, accessibility and sharing, and proposing solutions which could be implemented within CeTAmb LAB projects.

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Acronyms

CeTAmb LAB	Laboratorio di Ricerca sulle Tecnologie Appropriate per la Gestione dell'Ambiente nei Paesi a Risorse Limitate
DaBaCU	DataBase della Cooperazione Universitaria
Dgcs	Direzione Generale per la Cooperazione allo Sviluppo
Eln	Ejército de Liberación National
Fao	Food and Agriculture Organization
Farc-Ep	Fuerzas Armadas Revolucionarias de Columbia - Ejército de Pueblo
Maeci	Ministero degli Affari Esteri e della Cooperazione Internazionale
Ngo	Non-governmental organization
Who	World Health Organization

STRATEGIC PLANNING PROCESS IN A GENERAL RURAL HOSPITAL: AN EXPERIENCE AT DR. AMBROSOLI MEMORIAL HOSPITAL, UGANDA

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Sommario

Il Dr. Ambrosoli Memorial Hospital è un ospedale rurale localizzato a Kalongo (Uganda). L'ospedale sta affrontando nuove sfide e difficoltà che richiedono interventi strategici immediati. Il processo di *strategic planning* è stato guidato dal coinvolgimento degli stakeholder attraverso un processo partecipativo.
Il piano strategico include quattro *goal* che integrano diverse dimensioni (economica, sociale e ambientale) all'interno dei temi: fornitura di servizi, infrastrutture, *partnership* ed educazione. Lo scopo del piano è di formalizzare la visione strategica dell'ospedale, creando un programma quadro che permetta al *management* di preparare piani di lavoro e di *budget* così come di monitorare i progressi nel tempo.

Abstract

Dr. Ambrosoli Memorial Hospital is a general rural hospital located in Kalongo (Northern Uganda). The hospital isfacing new difficulties that call for urgent actions, which imposed a plan for its development. The strategic planning process was guided by engagement of stakeholders through a step-by-step participatory process.
The plan acknowledges four Strategic Goalsthat integrate different dimensions (economic, social and environmental) around the themes of service delivery, infrastructure, partnership and education. The purpose is to communicate the hospital's strategic vision, creating a framework that enables to prepare work plans and budgets, as well as monitor progresses over time.

Keywords

Rural hospital, strategic plan, participatory design

Introduction

Dr. Ambrosoli Memorial Hospital is in Kalongo Town Council, within Agago District - Northern Uganda. Most the neighbouring districts do not have functional hospitals and, therefore, it serves also their population for all conditions requiring hospitalization. Acholi is the main ethnic group and

their sub-region has been affected by a 22 years long insurgency and conflict which have derailed the social and economic growth of the area.

According to *National Population and Housing Census 2014* (Uganda Bureau of Statistics, 2014), Kalongo currently has a total estimated population of 11,077. Agago District is one of the poorest areas of the country and a large proportion of the population is living in a condition of poverty.According to the *Poverty Status Report* (Ministry of Finance, Planning and Economic Development of Republic of Uganda, 2014), 35.2% of the population in the mid North Region, where Agago District is located, lives below the national poverty line (less than 1$ per day) - against a national average poverty rate of 19.7% -, and 41.4% are insecure, though not poor.

The poverty north-south gap in Uganda is still relevant (World Bank Group, 2016) and any unexpected event (e.g. bad harvest, sickness or death of one member of the family) can change the status of insecure non-poor people to poor.

The District is still lacking a good road network. There are no tarmac roads and most are in poor maintenance conditions, occasionally disrupting routine field activities (transfer of patients for emergency care, immunisation campaigns, supervision of Lower level units, home visiting) and adding extra costs to all transport activities. Availability of power supply, although not constant and regular, has been nevertheless improving in the last years, at least in the major urban centres. In the hospital electricity is provided 24 hours per day, mainly thanks to general electricity supply, with generators for backup.

Table 1. Wards and services in the hospital

Obstetrics & Gynaecology Services
Antenatal, Delivery & Postnatal care, Prevention of Mother to child transmission (Mtct) of HIV, Emergency Obstetric and Neonatal care, General and Specialized Obstetric and Gynaecology Surgery
General Surgical Services
Trauma and Emergency Care, Surgical Clinic, Minor Orthopaedic services, Burns care, Anaesthesia, General surgical operations
Internal Medical Care
HIV Care and Treatment, General and private Out-patient (Opd), Clinic Emergency medical care, Electro Cardiogram (Ecg), Medical Admissions and care, Tb Detection and treatment, Communicable and Non-Communicable Diseases (Ncd) care and prevention
Paediatrics & Child Health
Young child clinic, Malnutrition, Therapeutic feeding, Neonatal Special Care Unit, Paediatric admissions and care, Immunization and health promotion
Community Health
Health promotion outreaches, Immunization, Health education, Primary Health Care
Health Training
Midwifery training, Internship for Medical Doctors and others like Clinical Officers, Pharmacy, Nurses, Midwives and laboratory students (guidance is usually provided by a senior staff in the discipline.)

Dr. Ambrosoli Memorial Hospital is a 267-bed general rural hospital with 5 wards: Medical, Surgical, Tubercolosis (Tb), Maternity and Paediatrics (see *Table 1*). Hospital's staff is composed of 245 employees, the 53.1% part of the *clinical staff*.

In Financial Year (Fy) 2015-2016 the hospital admitted a total of 22,274 patients with an increase of 74% from Fy 2014-2015. This increment is due mainly to the Malaria epidemic affecting Northern Uganda after the suspension of the *Indoor Residual Spray* campaign. This increase was observed in all the wards: Medical ward's admissions increased by 50.4%, the Surgical ward by 4.4%, the Paediatric ward by 186% (it had almost three times the patients of previous year), the Maternity ward by 27.9% and the Tb ward by 21.1%. These results allowed the hospital to rank third in the League Table amongst general hospitals in the *Annual Health Sector Performance Report 2015-16*(Ministry of Health - Moh- Republic of Uganda, 2016).Income decreased by 4.5% in the hospital, increased by 2.38% in the school and increased by 0.36% in theHealth SubDistrict (Hsd); expenditure exceeded income for the first time in five years by UGX 479,871,430/=. In relation to morbidity, in theFy2015-2016, due to the persistent epidemic, Malaria is the major cause in Hsd with 208,384 cases (39.7% of the total), followed by Respiratory Tract Infections (Rti) also considerably high at 25.4%. 21.4% of deaths recorded were attributable to Malaria, confirming the seriousness of the epidemic. Anaemia follows with 6.1% showing the impact of Malaria and poor nutrition (Dr. Ambrosoli Memorial Hospital, 2016). Cardiovascular diseases are the 5th cause of death registered, with a growing impact on population: probably, we are facing an *epidemiological transition* in the district due to the aging of the population and the changing in lifestyle. Ncds and chronic diseases, including Diabetes and Chronic Hepatitis B, are most likely grossly under-reported and, therefore, the dimension of their role and impact may be largely underestimated.

Alongside the hospital, the **St. Mary's Midwifery Training School (Smmts)** prepares professional midwives working throughout Uganda, focusing on prevention and treatment in mother and child care. So far it qualified a total of 1,053 Certificate Enrolled Midwives, 219 Registered Diploma Midwives, and 40 Enrolled Comprehensive Nurses for a total of 1,312 qualified health personnel.

The hospital and the school are facing new challenges and difficulties, including a shift in donors' priorities over the past years, especially concerning the support of recurrent expenditures; an increasing epidemiological transition towards Ncds and chronic diseases which coexist with communicable diseases; the lack of maintenance and proper upgrading of infrastructures and equipment.

The Hospital Strategic Plan 2016-2022 was led by 4 overarching issues: the identification of the main challenges to be faced in the coming years, the needed changes and steps to improve effi-

ciency, the need of achieving economic sustainability and the mission to guarantee access to health care for the most vulnerable.

Methods

The strategic planning process was guided by commitment to innovation and engagement of stakeholders: to achieve these principles, a step-by-step process was designed infusing broad engagement, meaningful dialogue and challenging discussion every step along the way. The process (see *Figure 1*) started at the beginning of 2016 and involved different key figures and stakeholders the town of Kalongo and the Agago district and from the hospital, through extensive consultations among the staffs at all levels. As part of the development of strategies and plans, we have used a systematic process started with a Swot analysis, a planning method for analysis of hospital and environmental factors. The environmental scanning and the assessment of the present situation led to the identification of four strategic goals. Through a participatory design approach, involving stakeholders (e.g. employees, partners, citizens), the hospital issues have been defined and the new strategies developed. Each of the four Strategic Goals underwent a process of analysis conducted by Working Groups that included staff, experts, and stakeholders, defining their objectives and projecting activities and task for strategy implementation, including planning and indicators for monitoring and evaluation of the process. The final version of the Strategic Plan was presented at the beginning of 2017.

Figure 1. The Strategic Planning Process

The Swot analysis

Swot is an acronym for *strengths*, *weaknesses*, *opportunities*, and *threats* and is a structured planning method for the development of strategies and plans through the analysis of:

- *Internal factors*, the strengths (characteristics that give it an advantage over others) and weaknesses

(characteristics that place the project at a disadvantage relative to others) internal to the organization.

- *External factors*, the opportunities (elements in the environment that the project could exploit to its advantage) and threats (elements in the environment that could cause trouble for the project) presented by the environment external to the organization.

The analysis (Table 2) shows that the hospital is a well-established institution. The hospital has been in existence for decades: his storied history and background represent an advantage but, at the same time, the hospital is faced with major challenges and a shift in donor's priorities is threatening the very low financial sustainability of the hospital. During the last Fys, the hospital has faced the rising of costs and the declining funds from sponsors and donors, both national and international. The environment is also changing: the population is facing an epidemiological transition due to the increase number of non-communicable chronic diseases (Ncds), with higher costs in health expenditure for treatments that often are lifetime.The results of the Swot analysis led to the identifications of four *Strategic Goals*.

Table 2. The results of the Swot analysis

The Stakeholders' Meeting

The Stakeholders' Meeting was an assembly of all parties, authorities, organizations and people interested in the life and services of an institution and took place in November 2016 with the theme "*Sustainability of services delivery in Dr. Ambrosoli Memorial Hospital, Kalongo*". It was an opportunity to address the main issues that are concerning the sustainability of the hospital and to present the results of the Swot analysis, the Strategic Goals (Sg) and their Objectives (So). The meeting has offered an occasion for accounting to the stakeholders (both programmatically and financially) of what the hospital is for and what it

does, to get the true understanding of the situation of the hospital, while the hospital had the chance to discuss and clarify its expectations from the stakeholders.The participants were invited to cooperate with the hospital during the Strategic Plan process andfive main recommendations have emerged:

1. Ensure commitment of all the hospital employees to the institution's mission.
2. Diversify the hospital's funding sources including widening the donor base.
3. Work towards ensuring retention of staff.
4. Internal communication among the supervisee & supervisor management to be improved.
5. Prudent revision of the new fees policy engaging the community.

The Working Groups

Final step was the definition of activities and tasks to implement the Sgs, together with the expected outcomes/outputs and the indicators to monitor accomplishments progress. Each of the four Sgs, along with their respective So, has been assigned to a dedicated Working Group (Wg)composed by subject experts and stakeholders, both from the hospital and other institutions, who worked together with the following tasks: making and reviewing objectives, activities, measures, and tactics identified to implement the plan; providing advice on strategic priorities; developing strategies for assessing progress of the implementation of the plan.Each group was provided with Planning Tools for:

- Activities, outcome and outputs, and indicators definition.
- Time-line and milestones delineation.
- Monitoring and evaluation.

The meetings were facilitated by two consultants from University of Milan with the purpose of exchanging ideas and information and making decisions on the Strategic Plan. Through a participated process of information sharing, group discussions and debates, considering the materials from the Swot analysis and the Stakeholders' meeting, each group arrived at the definition of the activities, outcome and outputs, and indicators.

Results

The Dr.Ambrosoli Memorial Hospital Strategic Plan sets the objectives to achieve between 2016 and 2022. This Plan reflects the need to continue providing high quality and effective care services setting out the key goals and objectives for the hospital. The Plan acknowledges four Strategic Goals representing ambitious ethical, practical and economic commitments:

1. **Health care service delivery adapted to changing environment and quality demands**
2. **Institutional development**
3. **Infrastructure renovation and maintenance**
4. **Teaching and Training Services upgraded and broaden**

The four goals integrate different dimensions (economic, social and environmental) around the themes of health, infrastructure, partnership and education remaining deeply interconnected. They seek to prioritize the commitment of serving poor and vulnerable people, while also focusing on quality, efficiency and efficacy of the delivered services, and the empowerment of the staff. They were consequently structured into *Strategic Objectives* with related planning tools, containing: activities, outcome/outputs, and indicators; time-line and milestones; tools for monitoring and evaluation (list of performance indicators, relevant key targets and metrics). The four strategic goals are supported by the following four organizational strategic enablers:

- **Quality**: ensure a culture of continuous quality improvement and risk management
- **Efficiency**: deliver care and service in a cost-effective manner
- **HumanResources**: ensure recruitment and retention of qualified hospital staff through career and training promotion
- **PhysicalEnvironment**: provide appropriate facilities to deliver care and services and to decently accommodate staff

Furthermore, the implementation also calls for a plan with clearly defined monitoring and evaluation systems: the plan is intended to cover a 6-year period to be translated into annual plans of action before the end of every Fy. Thus, the implementation will be evaluated annually and a midterm review will be undertaken 3 years after launching, putting in place, if needed, corrective measures or new thinking and action to address new challenges.

Health care service delivery

The hospital aims at delivering health services with special preference for the poor and most vulnerable and disadvantaged people being faithful the national recommendations from *Health Sector Development Plan (Hsdp) 2015/16 - 2019/20* (Ministry of Health - Republic of Uganda, 2015). The social background and health context in which the hospital is located have changed over the years and continue to transform. Even if the area, devastated by years of war, is still rural and poor and far from the major centres of the country, at the same time it is influenced by socio-demographic changes taking place across Uganda. The demographic and epidemiological transition (the replacement of infectious diseases by chronic diseases over time due to expanded public health and sanita-

tion) which is under way in most low-income countries, is leading to very significant changes in the pattern of diseases, especially in sub-Saharan Africa. The double burden of diseases (the fact that both infectious diseases and Ncds tend to coexist) is causing a rise in health problems and the future challenges are related to coping with it, implementing effective measures and upgrading the hospital to contain and manage the rise in Ncds. Two strategic objectives have been developed:

- **Strategic Objective 1.1**: to deliver quality health services while being aware of and considering the needs of the less privileged and vulnerable social groups including women, children and the chronically ill.
- **Strategic Objective 1.2**: to create a network with nearby hospitals, providing better and broader care.

STRATEGIC OBJECTIVE 1.1focuses on expanding health services and strengthening the existing, like Surgery, HIV/AIDS care, maternal, new-born care and nutrition, palliative care, and the outpatient department, to increase coverage and utilization, improving quality and efficiency while optimizing resources. The activities have been grouped under three thematic areas – *Medical and Surgical Care, Public Health Interventions,* and *Services* – managed by a project coordinator to simplify the implementation. All the planned activities aim to fulfil standards and requirements of national and international guidelines and recommendationse.g. Stepwise Laboratory Improvement Process Towards Accreditation -Slipta (Who Regional Office for Africa, 2015) and Millennium Development Goals - Mdgs(Who, 2015).Moreover, the So 1.1 includes fundamental and cross-cutting tasks, such as continuing medical education and continuing professional development, and the revision and distribution of clinical guidelines and pathways.

STRATEGIC OBJECTIVE 1.2aims to lay the foundation for a scientific and practical exchange with Hospitals in the North of Uganda, strengthening the existing cooperation through the establishment of networks. The ambition is to provide specialist health services through cost and services sharing (such as dentistry, psychiatry, orthopaedics) that are not financially sustainable for the hospital alone creating a model of integrated care, working with other hospitals and health-care providers, designing a comprehensive system that is accountable and accessible to the community and covers the entire continuum of care from primary to specialty care.

Institutional development

The hospital is addressing pervasive financial and management challenges that undermine its efforts to attain a good level service. Therefore, four Strategic Objectives have been identified, aimed at strengthening the hospital's core management processes:

- **Strategic Objective 2.1**: to increase Hospital financial sustainability, improving efficiency while providing high quality and cost-effective care.
- **Strategic Objective 2.2**: to sustain capacity building and human resource management through the gradual spread of the principles of participatory management style and a career development path.
- **Strategic Objective 2.3**: to introduce a result based financial administration.
- **Strategic Objective 2.4**: to ensure constant high patient satisfaction.

STRATEGIC OBJECTIVE 2.1. Main hospital's challenge is to achieve financial sustainability focusing on the implementation of an appropriate model that can guarantee economic support over time and promote a constant development of the hospital. It is crucial to sustain the current levels of support and to identify new sources of funding, considering that the current ones for health services are still inadequate compared to the needs, affecting the performance and the stability of the hospital. The preliminary action is to develop and implement a detailed and effective system of cost monitoring, allowing the Hospital to calculate the magnitude and the details of its total expenditures. The establishment of a Budget and Controlling division will be of help in the provision of a cost-effective care. The estimation of costing for giving services quotes (e.g. to partners, donors, health insurances) and the setting up of cost centres and clear references, are essential tasks in the achievement of this activity. At the same time, strengthening a culture of fundraising and enhancing the portfolio of donors, together with the registration as Non-governmental Organization (Ngo), broadening the range of available programs and financial instruments, could allow the hospital to seek for external financial support to face the rising healthcare cost.

STRATEGIC OBJECTIVE 2.2. Health workers are the main asset of the hospital and the fundamental resource for service provision. The hospital is committed to offer adequate opportunities for personal and career development. Another priority will be to strengthen the approach to human resources development to enable staff to acquire appropriate skills and competencies. A key cross-cutting issue will be to promote a productive and supportive working environment for all staff. To oversee these proposed initiatives, we recognize the need to strengthen the capacities of the Human Resources Office.

STRATEGIC OBJECTIVE 2.3. The implementation of result-based management and pay for performance payment model over the next six years, represents an approach to increase efficiency and quality of the Hospital, while reducing healthcare expenditure. Results-based management is a strategy which uses feedback loops to achieve goals involving all people who contribute directly or indirectly to the result, mapping out processes, products and services and showing how they contribute

to the outcome. In the healthcare industry, pay for performance (P4p) is a payment model that offers financial incentives to physicians, hospitals, medical groups, and other healthcare providers for meeting certain performance measures.

STRATEGIC OBJECTIVE 2.4. Patient satisfaction is an important and commonly used indicator for measuring the quality in health care and it can be used as an important tool in the selection of priorities and monitoring of hospital policies.

Infrastructure renovation and maintenance

Some of the buildings, equipment, furniture and hospital power and water plants, do not meet the actual standards for quality and safety (Dr. Ambrosoli Memorial Hospital, December 2016; Dr. Ambrosoli Memorial Hospital, May-June 2016). It is fundamental to develop a strategy and a plan for infrastructure and medical equipment maintenance, including periodic reviews assessing upgrade strategies, vulnerabilities and security maintenance requirements. Priority must be given to consolidation and upgrade of existing services. The hospital lacks an effective equipment inventory, and there is no record of the medical and non-medical equipment. Such infrastructure and equipment renovation, maintenance and expansion need an important capital investment. To face as efficiently as possible these evident problems, the following three strategic objectives were developed:

- **Strategic Objective 3.1**: To develop a maintenance master plan to ensure that the hospital can continue delivering services.
- **Strategic Objective 3.2**: To develop a master plan and implement a clear action plan with priorities and milestones.
- **Strategic Objective 3.3**: To ensure funding for additional capital investments.

The final target is to ensure the availability of a functional, efficient and sustainable health infrastructure.

STRATEGIC OBJECTIVE 3.1 is mainly focused on existing infrastructures and equipment. Implementing and maintaining quality inventory management procedures can quickly lead to a more efficiently run hospital, as well as significant cost savings (Who, 2011). Moreover, performing periodical clinical equipment inventories contributes to the development of a preventive maintenance system.The consequent step is the development a maintenance master plan for infrastructure and equipment. A periodic reporting system, with annual meeting, may help to promote a more effective maintenance.

STRATEGIC OBJECTIVE 3.2. The development of a Master Plan is advised to help the organization's management to implement a complex and widespread project facilitating the monitoring of

progress. The master-plan, comprising different projects, will provide an overall view on the activities while ensuring an improved coordination between the various tasks, rationalizing expenses.

STRATEGIC OBJECTIVE 3.3. To implement the tasks and activities from Strategic Objective 3.1 and 3.2, a large amount of funding and capital investments will be needed. It will be essential to seek for external funding through the application to calls for proposals creating projects on health infrastructures and equipment (maintenance, renovation, construction).

Teaching and Training Services upgraded and broaden

St. Mary's Midwifery Training School (Smmts) needs to expand its teaching capacity, both by increasing the number of enrolled students and by a continuous and intensive further training of teachers, to ensure the quality standards so far achieved are maintained. The school is also geared to exploring new forms of organization in education, implementing a distance learning course program with the establishment of a Distance Learning Department. With the intention to provide an up-to-date education, the working group decided to complement the Diploma in Midwifery with the establishment of a Bachelor's Degree in Midwifery, ensuring that students gain valuable knowledge and specialist skills improving country's maternal health.

To achieve the SG 4, the following three strategic objectives were developed:

- **Strategic Objective 4.1**: To expand the teaching capacity of Smmts.
- **Strategic Objective 4.2**: To Ameliorate and upgrade the Smmts.
- **Strategic Objective 4.3**: Creation of the Bachelor's Degree course in Midwifery at Smmts.

STRATEGIC OBJECTIVE 4.1 focuses on the Diploma in Midwifery (Dm) and Certificate in Midwifery (Cm).

STRATEGIC OBJECTIVE 4.2.focuses on preparing the Bachelor of Science degree in Midwifery course, operating both on employees and on infrastructures, planning the foundation of a new Campus creating dynamic teaching and learning environments with state-of-the-art facilities in line with the National Council for Higher Education (Nche) criteria.

STRATEGIC OBJECTIVE 4.3 is focused on the program conceptualization by a planning committee and the accreditation to teach of the Bachelor of Science degree in Midwifery following the requirements from Nche.

Monitoring and Evaluation (M&e)

Monitoring and evaluating the status of implementation of the plan is as important as identifying strategic issues and goals by continuously monitoring and measuring progresses through a clearly

defined system, ensuring that the hospital is following the direction established with a results-based management approach. The strategic plan will be translated into annual plans of action before the end of every financial year.

The implementation of the plan will be evaluated annually, and a midterm review shall be undertaken three years after launching, putting in place, if needed, corrective measures or new thinking and actions to address new challenges. M&e helps improve performance and achieve results, providing timely and accurate data. There are two distinguished moments: *monitoring*, the set of detection devices (performance indicators) and data; *evaluation*, critical interpretation of the measured data. The M&e process will serve as a framework for measuring the organizational performance and the success of the strategy and for tracking progress, supplemented by key targets and metrics (performance indicators, see Table 3).

M&e allows the management to recognise and understand reasons for changes and update of the plan to reflect the new directions: deviations from the plan usually result from changes in the hospital's external environment, changes in the availability of resources and funding, etc.

M&e will be a multi-step process carried

Table 3. List of performance indicators for M&E

SG1: Health Care Service Delivery
▪ % of HIV+ people on Art (for 6 months) with suppressed viral load (Unaids target)
▪ % of neonatal asphyxia
▪ % of people living with HIV receiving ART (Unaids target)
▪ % of people with HIV knowing their status (Unaids target)
▪ % of pregnant women who attended Ante-natal Care (Anc) service 4 times (or more)
▪ % of properly filled Who Surgical Safety Checklist (Who, 2009) over the number of surgical procedures performed
▪ % of staff trained and re-orientated each year
▪ % stock-out of 10 tracer indicator drugs per month (Who, 2012)
▪ Unepi Immunization coverage per disease (Ministry of Health Republic of Uganda, 2016)
▪ Maternal mortality ratio
▪ Neonatal mortality ratio
▪ Stillbirth rate
SG2: Institutional Development
▪ Sustainability ratio
▪ % of patient satisfaction levels
▪ % of staff satisfaction levels
▪ % projects completed on proposed
SG3: Infrastructure renovation and maintenance
▪ Fault and failure frequency (number of corrective maintenance tasks on the total amount of equipment/machine)
▪ % of construction, renovation and maintenance projects completed on time
SG4: Teaching and training services
▪ % of candidates who passed the final end-of-course examinations
▪ % of teaching staff who upgraded their qualifications
▪ % of Ncheaccreditationcriteriasatisfied (Uganda Nche, 2001; Uganda Nche, 2008)

out by the following activities:

- **Action Plan**: the Wgs will be responsible of their Strategic Goals and their implementation, translating each Strategic Objective in plans of action before the end of every Fy. The action plan will include budget analysis.
- **Monitoring**: the Wgs will be responsible of collecting data during the implementation of tasks and activities monthly, quarterly reporting the status of the implementation and achievements of objectives to the Chief Executive Officer (Ceo), including progress toward each of the overall strategic goals.
- **Annual Activity Report**: annually,Wgs will monitor and assess progresses of their plans of action using dedicated performance indicators. This will produce an Annual Activity Report, where to describe achievements and to explain failure and their reason, that will be part of the Analytical Report and will serve as a guide for the subsequent Fy.The Wgs will be monitored and oversee by the Hospital Management Team.
- **Mid-term review**: after three years, a mid-term review will be undertaken. Data collected from the previews Annual Activity Report, will be extensively discussed and analysed by the Working Groups and then will be presented to the Stakeholders. If needed, an addendum of the Strategic Plan will be produced covering minor or major reviews, embracing: the changes to goals, objectives, responsibilities and time-lines, what is causing changes to be made and why the changes should be made.
- **Final evaluation and Report**: the final evaluation will take place after six years (first semester Fy2021-22) and will cover an analysis of data and indicators from the Strategic Goals and their critical interpretation, underlining accomplishments and failures and explaining their motivation.
- **New Strategic Plan**: in theFy2021-22 the new Strategic Plan will be elaborated from the results of the report.

To help in the monitoring and evaluation process, a list of relevant key targets and metrics (performance indicators) was developed, covering the four Strategic Goals. The set of performance indicators (see Table 3), chosen among the list of indicators, have been designed to be: **direct** (an exact measure of each result); **objective** (unambiguous about what is to be measured and how); **adequate** (the minimum number required to capture the result); **practical** (data can be collected in a timely and cost-effective manner).

Conclusions

The purpose of the plan is to communicate the hospital's strategic vision for the next years. The plan is far reaching, ambitious and aims to significantly improve health services delivery, institutional and human resources development, renovation and maintenance of infrastructures and upgrade of the training school.

At the core of our strategy is the financial sustainability of the hospital: the *conditio sine qua non* to accomplish the Plan is represented by the availability of sufficient resources. Indeed, to achieve the goals and the objectives set out in this plan, new sources of funding are necessary to carry out the work identified.

The current funding for health services is still inadequate compared to the needs: the hospital's primary source of income is yet the donors, mainly Dr.Ambrosoli Foundation, Comboni Missionaries and Uganda Catholic Medical Bureau (Ucmb), who represents more than 70% of the income of the hospital. The remaining part of the income is represented by a sure and constant support from the Ministry of Health and the Government of Uganda (13% of the income in the formerFy2015-16), and from the patients of the hospital (14% in the last Fy). It is necessary to sustain the current levels of support and to identify new sources: the establishment of a Fundraising Department with Research and Development Office will oversee maintaining financial sustainability over time and promoting a constant development of the hospital. Moreover, management of the health expenditure, increasing efficiency and cost-effectiveness of the care represents both a challenge and a requirement to achieve sustainability.

The plan is a framework that enables the hospital Board of Governors and Management to take decisions guiding the preparation of annual work plans and budgets, as well as monitor progresses over time. The vision and the strategic priorities were defined through a participatory process, recognising the importance of the stakeholders, primarily the hospital's patients. Stakeholders helped to improve our approach to deliver higher quality of care, and improve the accessibility and sustainability of services and the hospital, together with a new and unprecedented level of partnership with other providers in the community. At the end, it will be monitored, reviewed and revised by the staff, stakeholders and experts, continuing the participatory process designed for its creation. The plan has been built through an innovative pathway that could be used for strategic planning in similar rural contexts. Above all, the participatory design approach, involving employees, partners and citizens, with its political dimension of empowerment and democratization, turned out to be a winning strategy to include all levels of users of the hospital. Moreover, the Plan was developed through an intense cooperation between different partners and institutions, like the Dr.Ambrosoli

Foundation, the hospital management, the University of Milan and the Institute for Reproductive Health of the Georgetown University Field Office, bringing their efforts to fulfil standards both from national and international guidelines and recommendations, and transferring knowledge and know-how between the north and south of the world.

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- **Sg4**: *Carmel Abwot*; SantinaAcan; Polly Akot; PaskaLalam; Maurice Okao; Quinto Owot.

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Nomenclature

Aids	Acquired Immune Deficiency Syndrome
Anc	Ante Natal Care
Art	Anti-Retroviral Therapy
Ceo	Chief Executive Officer
Ecg	Electro Cardiogram
Fy	Financial Year
Hiv	Human Immunodeficiency Virus
Hsd	Health Sub District
Hsdp	Health Sector Development Plan
M&E	Monitoring and Evaluation
Moh	Ministry of Health
Mtct	Mother To Child Transmission of HIV
Ncds	Non-Communicable Chronic Diseases

Nche	National Council for Higher Education
Ngo	Non-Governmental Organization
Opd	Out-patient Department
P4p	Pay for Performance
Rtis	Respiratory Tract Infections
Sdg	Sustainable Development Goal
Sg	Strategic Goal
Slipta	Stepwise Laboratory Improvement Process Towards Accreditation
Smmts	St. Mary's Midwifery Training School
So	Strategic Objective
Swot	Strengths, Weaknesses, Opportunities, And Threats (analysis)
Tb	Tuberculosis
Ucmb	Uganda CatholicMedical Bureau
Unaids	The Joint United Nations Programme on HIV/AIDS
Unepi	Uganda National Expanded Program on Immunization
Wg	Working Group
Who	World Health Organization

PROGRAMMI DI ASSICURAZIONE SANITARIA COMUNITARIA: ANALISI DI FATTIBILITA' PER UN CASO STUDIO IN UGANDA

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Sommario

Un'adeguata protezione finanziaria in caso di malattia risulta indispensabile al fine di prevenire gravi effetti di impoverimento legati alle spese sanitarie. Forme di assicurazione sanitaria a livello comunitario costituiscono uno strumento innovativo per fornire protezione finanziaria alle popolazioni povere rurali. Un'analisi di fattibilità per uno schema di micro-assicurazione è stata condotta nel distretto rurale di Oyam, Uganda, con l'obiettivo di verificare l'esistenza di alcune importanti precondizioni. La ricerca ha adottato un approccio di metodi misti e l'analisi dei dati ha permesso di validare tutte le condizioni di fattibilità, indicando lo schema quale valido sistema per migliorare significativamente l'accesso ai servizi sanitari.

Abstract

Financial protection in cases of illness is indispensable in preventing catastrophic health expenditures. In low- and middle-income countries, Community-based Health Insurance (CHI) constitutes an innovative tool for providing universal financial protection for rural populations. A feasibility study on CHI was carried out in the Oyam district, Uganda, in order to determine whether the necessary conditions exist for the establishment of a successful scheme. The research adopted a mixed-methods approach and the evidence from the data analysis validated all the feasibility conditions. Overall, this system has the potential to improve access to health care of the local population.

KEYWORDS: Uganda, Community Health Insurance, Analisi di fattibilità, Metodi misti.

Introduzione

Molte famiglie dei paesi a medio e basso reddito non dispongono di una protezione finanziaria adeguata in caso di malattia, di incidente o di morte (ILO, 2005) e sono così costrette ad affrontare pagamenti *out-of-pocket* che creano impoverimento e deprivazione (Adebayo, 2015). Nonostante i governi siano tenuti a svolgere un ruolo guida in questo senso, solo una piccola parte delle entrate pubbliche in tali paesi è di fatto destinata all'erogazione di servizi sanitari. Al contrario, i pagamenti diretti da parte dei pazienti sono predominanti e gravosi. Un'inadeguata protezione finanziaria danneggia in primis le famiglie più povere, costrette ad affrontate l'imprevedibilità delle spese mediche (Magezi, 2002).

Negli ultimi anni in Asia e in Africa Sub-sahariana si è registrata una relativa diffusione di assicurazioni sanitarie a livello comunitario (*Community based Health Insurance- CHI*). Questo modello è stato infatti indicato quale valida innovazione per fornire un'adeguata protezione finanziaria e, dunque, migliorare l'accesso alle cure da parte delle popolazioni povere residenti in zone rurali. Lo schema si basa sulla mobilitazione di contributi finanziari da parte dei membri della comunità attraverso un sistema di prepagamento. Sebbene tale soluzione possa contribuire in modo significativo al raggiungimento di una copertura sanitaria universale, diversi studi hanno analizzato limiti e difficoltà operative che spesso ostacolano il raggiungimento del suo pieno potenziale. L'interazione tra questo tipo di intervento e il contesto empirico può spesso spiegare i risultati divergenti riportati dalle varie esperienze di micro assicurazione (Criel, 2004). In particolare, un'analisi approfondita di De Allegri (2009) evidenzia 5 categorie di ostacoli che impediscono una efficiente implementazione di CHI in contesti Sub-sahariani: a) assenza di un quadro legislativo adeguato, spesso dovuta ad una politica nazionale frammentata in termini di finanziamento dei sistemi sanitari; b) scarsa capacità manageriale dei fondi che non riesce a garantire un appropriato livello di protezione finanziaria; c) insufficienti misure di controllo per evitare casi di selezione avversa e azzardo morale; d) costi di gestione sproporzionati in confronto alla raccolta complessiva dei contributi finanziari; e) bassi tassi di iscrizione allo schema di assicurazione volontaria, che si traducono in una limitata mobilitazione di risorse e *risk-pooling*.

Secondo studi recenti (Mladovsky, 2015, Mladovsky, 2014, Shigute, 2017), inoltre, una buona copertura assicurativa può dipendere anche dal livello di capitale sociale della popolazione, espresso in termini di forme di solidarietà esistenti tra i membri della comunità e grado di fiducia verso chi propone questo tipo di sistema. Infine, le lunghe distanze da percorrere e le difficili soluzioni di trasporto per raggiungere i centri sanitari rivestono spesso un ruolo cruciale nel determinare l'aderenza a CHI (Basaza, 2008; Abiiro, 2014; Bennett, 2001).

Benché numerosi studi abbiano valutato ex post l'impatto di diversi tipi di intervento sul livello di accessibilità alle cure, analisi di fattibilità volte ad identificare condizioni specifiche per l'implementazione di uno schema di CHI nel contesto locale risultano ancora scarse (Zeng, 2017; Dong, 2004). In particolare, alcuni studi hanno concentrato l'attenzione esclusivamente su aspetti di fattibilità finanziaria (Eckhardt M, 2011; Mathauer I, 2007), mentre un approccio di analisi olistico permetterebbe di dare importanti indicazioni di policy.

A tale scopo, questa analisi intende fornire una comprensiva valutazione di fattibilità per uno schema di CHI nel distretto rurale di Oyam, Uganda. La ricerca esamina sistematicamente i comportamenti e le preferenze della comunità locale rispetto all'accesso ai servizi sanitari e ad una potenziale assicurazione sanitaria. L'analisi del contesto locale è dunque volta a testare l'introduzione di un valido modello comunitario di assicurazione. Sono state considerate 6 specifiche precondizioni proposte in un importante manuale di riferimento (ILO, 2005); tali criteri di fattibilità riguardano caratteristiche e preferenze a livello comunitario, oltre a standard di qualità delle cure offerte.

1) La comunità locale dovrebbe percepire la possibilità di avere **protezione finanziaria** in caso di malattia e maternità quale priorità associata al rischio di impoverimento della famiglia per spese sanitarie. Dunque, oltre a costituire un reale bisogno, la protezione finanziaria dovrebbe rappresentare una reale preoccupazione avvertita dalla popolazione.

2) I servizi sanitari coperti dall'assicurazione dovrebbero soddisfare standard di **qualità** accettabili per la comunità. Di conseguenza, le famiglie dovrebbero avere una buona considerazione delle prestazioni offerte dai centri sanitari e del grado di accessibilità in termini di trasporto e distanza.

3) La terza precondizione richiede che vi sia un buon livello di **fiducia** da parte della popolazione verso i promotori dello schema e le persone coinvolte nella sua gestione. Infatti, un'adeguata affidabilità delle autorità locali a capo dell'assicurazione rappresenta un attributo fondamentale per la sua buona riuscita.

4) Al fine di facilitare la comprensione dei principi di *risk-sharing* e, dunque, l'accettazione dello schema, è rilevante il livello di **capitale sociale** esistente tra i membri della comunità; ad esempio, tradizioni di mutuo aiuto dovrebbero risultare consolidate all'interno della popolazione locale.

5) La presenza di un generale trend di **sviluppo socio-economico** costituisce la quinta precondizione; la maggior parte delle famiglie, infatti, dovrebbe essere in grado di pagare i contributi finanziari richiesti in termini di premio assicurativo. Dato che l'agricoltura di sussistenza rappresenta la principale attività socio-economica della popolazione, modalità e tempistiche di

finanziamento dovrebbero tenere conto delle fluttuazioni stagionali dei redditi. L'appropriatezza di tali soluzioni di pagamento riveste un ruolo chiave per la partecipazione allo schema di molte famiglie.

6) Infine, il numero di potenziali **partecipanti** dovrebbe essere sufficientemente alto già dal primo anno, in modo da garantire la validità di principi di *risk-sharing* e *resource-pooling*.

Contesto

Lo studio è stato svolto nel distretto rurale di Oyam, in Uganda. Quest'area conta una popolazione di circa 408.000 abitanti. Il recente passato di guerra civile ha influenzato negativamente il profilo sanitario e lo sviluppo economico della comunità locale: l'85% degli abitanti vivono in povertà in confronto ad una media nazionale del 24.5% (UBOS, 2014); l'agricoltura di sussistenza rappresenta la principale attività socio-economica della popolazione; inoltre, la maggioranza degli indicatori di salute risultano più bassi della media nazionale.

Il sistema sanitario regionale è caratterizzato da una pluralità di attori coinvolti nell'erogazione dei servizi: il governo possiede circa il 60% dei centri sanitari, il settore *private not for profit* conta per circa il 30% delle strutture, mentre il resto è legato al settore *private for profit* (Basaza, 2008). Mentre la spesa sanitaria pubblica rappresenta solamente il 17% della spesa totale, la cooperazione allo sviluppo e il settore privato contano rispettivamente per il 41 e 42% dei finanziamenti. Forme di assicurazioni private e sociali sono ancora poco sviluppate nel paese e riguardano principalmente settori formali e urbani (MoH Uganda, 2016).

Dato il sostegno dell'Organizzazione Mondiale della Sanità (OMS) verso forme innovative di finanziamento della spesa sanitaria volte a garantire una copertura sanitaria universale, in Uganda *l'Annual Health Sector Performance Report* ha incluso tra le raccomandazioni chiave quella di ridurre le spese sanitarie *out-of-pocket* attraverso l'introduzione di sistemi assicurativi di prepagamento (MoH Uganda, 2012). Esistono, difatti, già alcuni casi di micro assicurazione sanitaria nel paese. Riguardo il caso studio trattato in questa analisi, la ONG "Medici con l'Africa Cuamm", che porta avanti progetti di sviluppo sanitario nel distretto di Oyam, ha pianificato di implementare uno schema di CHI in collaborazione sia con il sistema pubblico sia con le strutture *private not for profit*.

Metodi

Lo studio ha adottato un approccio di metodi misti, con l'utilizzo di strumenti di ricerca qualitativi e quantitativi. Questi sono stati condotti in sequenza e integrati, e hanno riguardato un'indagine su 180 famiglie, interviste individuali a 40 stakeholders e 8 focus group collettivi (Tabella 1). Il lavoro sul campo è stato svolto durante i mesi di ottobre-dicembre 2016. A tutti i partecipanti, dopo essere stato spiegato l'obiettivo dello studio, è stato richiesto un consenso scritto informato. Tutte le interviste si sono svolte in luoghi isolati.

Tabella 1- Metodi di indagine.

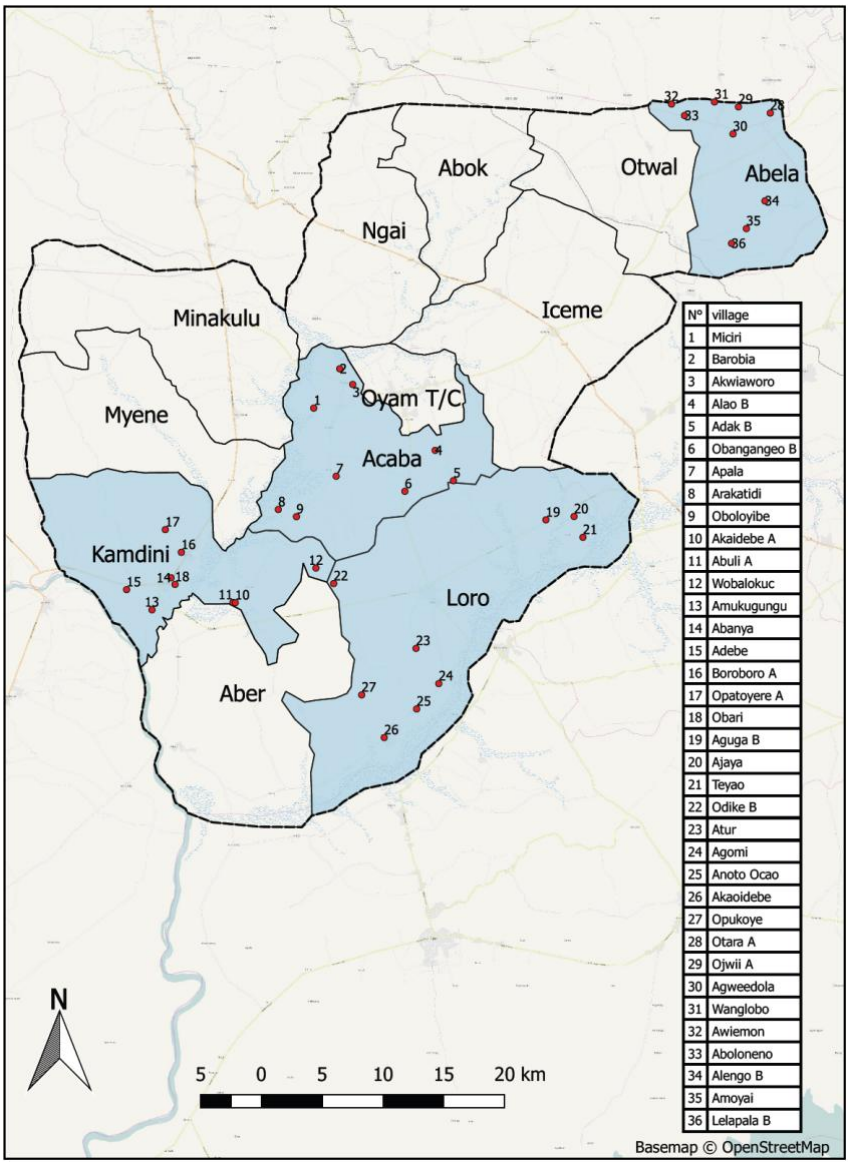
METODO	TARGET	QUANTITA'
Indagine sulle Famiglie	Membri della comunità	180 questionari
Focus group strutturati	Leader a livello locale	4 discussioni
	Gruppi di solidarietà	4 discussioni
Interviste individuali	Autorità della sub county	14 interviste
	Rappresentanti dei centri sanitari	2 interviste
	Leader dei gruppi	24 interviste

(Biggeri et al., 2018)

I dati sono stati raccolti in un'area pilota dl distretto, costituita da 4 sub counties (su un totale di 12): Acaba e Aleka nella parte nord del distretto e Kamdini e Loro nella parte sud. Questi territori, che contano complessivamente circa 171.000 abitanti, sono stati scelti intenzionalmente al fine di rappresentare il contesto socio-economico e geografico dell'intero distretto.

Il team di ricerca ha condotto l'indagine sulle famiglie applicando un campionamento randomizzato su 3 livelli. All'interno di ogni sub county, sono stati scelti casualmente 3 sotto-unità territoriali (parishes) e, all'interno di ognuna di queste sono stati selezionati 3 villaggi. Infine, in ogni villaggio, 5 famiglie sono state intervistate (Figura 1). La numerosità totale del campione, composto da 180 famiglie, è stata precedentemente determinata mediante una specifica *power analysis*.

Figura 1- Campionamento randomizzato dell'indagine.



(Biggeri et al., 2018)

Tutte le famiglie coinvolte sono state intervistate tramite questionario. Questo ha permesso di investigare le principali tematiche rilevanti, a livello comunitario, per valutare la fattibilità dello schema: le caratteristiche demografiche e socio-economiche della popolazione, le principali statistiche di morbilità, i comportamenti adottati in caso di malattia e maternità, i metodi di finanziamento per coprire le spese sanitarie, il livello di abilità e disponibilità a partecipare ad una assicurazione sanitaria e la presenza di gruppi di mutuo soccorso già esistenti sul territorio.

Inoltre, 40 interviste individuali e 8 focus group collettivi sono stati svolti nell'area pilota. Le interviste individuali hanno coinvolto le principali autorità tecniche e politiche del distretto, i dirigenti delle strutture sanitarie e i leader dei gruppi di solidarietà già esistenti. La discussione ha

voluto indagare le specifiche opinioni degli intervistati riguardo l'intervento e il loro potenziale ruolo durante il suo funzionamento. Al fine di garantire un certo grado di uniformità delle interviste, queste sono state basate su una lista di domande semi-aperte, riguardanti 5 aspetti principali: il pacchetto di servizi da includere nello schema assicurativo, gli attori più appropriati per gestire l'assicurazione, il ruolo rivestito dalle autorità locali durante le fasi di preparazione e implementazione, e possibili raccomandazioni e rischi legati a tale modello comunitario. Inoltre, durante le interviste con i leader dei gruppi già esistenti, sono state raccolte informazioni importanti riguardo il loro funzionamento e l'organizzazione interna.

Infine, i partecipanti ai focus group collettivi sono stati selezionati tra i principali rappresentanti della comunità, bilanciando la composizione in termini di età, genere e occupazione. Ad ogni gruppo, formato da 12 persone, hanno preso parte le seguenti categorie: leader religiosi e politici, *Village Health Workers*, leader dei clan e dei villaggi, rappresentanti di gruppi di donne, insegnanti e poliziotti. La discussione è stata impostata attorno a 2 principali tematiche. In primo luogo si è voluto indagare quelli che sono gli ostacoli all'accesso ai servizi sanitari che la popolazione avverte maggiormente; sono stati trattate in modo approfondito problematiche legate alla distanza, ai costi eccessivi e alla scarsa qualità delle cure. Durante la seconda parte degli incontri è stato implementato uno specifico strumento di analisi denominato *Opportunity Gap Score matrix* (Biggeri & Ferranini, 2014). Al fine di valutare le *capabilities* della popolazione in termini di accesso ai servizi, ai partecipanti è stato richiesto di classificare su una matrice (visualizzata sul pavimento) le varie opportunità di accesso fruite da diversi membri della comunità (Tabella 2).

Tabella 2- Opportunity Gap Score Matrix.

	Uomo adulto	Donna adulta	Donna in gravidanza	Persona con disabilità	Persona HIV positiva	Persona giovane	Orfano	Persona anziana
Opportunità di trovare personale sanitario qualificato								
Opportunità di trovare farmaci								
Opportunità di ricevere educazione sanitaria								
Opportunità di trovare trasporto di emergenza								
Opportunità di sentirsi a proprio agio senza stigma sociale								

Risultati

Tramite l'analisi dei dati raccolti con i diversi metodi di indagine, è stato possibile testare le 6 precondizioni necessarie per programmare un valido schema di micro assicurazione sanitaria.

1) La popolazione percepisce la protezione finanziaria in caso di malattia e maternità come una priorità associata al rischio di impoverimento.

I risultati dei questionari rivolti alle famiglie e delle interviste, sia individuali sia collettive, concordano nell'indicare che la salute, insieme all'educazione e al cibo, rappresenta una delle principali preoccupazioni avvertite dai membri della comunità. In particolare, l'81% delle famiglie ha riportato la salute e l'accesso alle cure tra i 3 principali bisogni. Nel 57% dei casi di malattia e maternità, le persone hanno dovuto vendere prodotti agricoli o altri beni, inclusa la terra, per coprire le spese sanitarie. Le famiglie sono dunque consapevolmente preoccupate per gli effetti di impoverimento legati all'accesso ai servizi.

2) I servizi sanitari presenti soddisfano standard di qualità accettabili per la comunità.

E' stato osservato che la qualità percepita, insieme alla distanza, è tra i principali criteri che guida la scelta della struttura sanitaria a cui rivolgersi in caso di bisogno. Le famiglie mostrano in generale una buona considerazione delle prestazioni offerte dai centri sanitari; tuttavia, il grado di accessibilità in termini di trasporto e distanza non sembra essere sufficiente. Durante i focus group, in particolare, il punteggio riservato all'opportunità di raggiungere facilmente i servizi è risultato

sempre relativamente basso in confronto alle altre dimensioni di accesso, mentre il punteggio riservato alla qualità delle cure è rimasto alto. In media, le famiglie distano 3,27 Km dal centro sanitario più vicino e addirittura 41,38 Km dall'spedale distrettuale. Altri fattori complementari, quali cattive condizioni delle strade e mancanza di veicoli a motore per gli spostamenti, contribuiscono a peggiorare l'accessibilità alle cure. Di conseguenza, la componente del trasporto è stata indicata ripetutamente quale importante complemento del pacchetto di servizi coperto dall'assicurazione.

3) La popolazione dimostra fiducia verso i promotori dello schema e le persone coinvolte nella sua gestione.

Data la lunga presenza del Cuamm nel distretto e la buona riuscita degli interventi di sviluppo sanitario già implementati, la comunità conosce i promotori ed ha una buona reputazione di loro. Inoltre, è stata dimostrata fiducia verso i principali rappresentanti dei centri sanitari e i leader comunitari a livello di villaggio. Le autorità distrettuali, tramite interviste individuali e collettive, hanno dichiarato di voler supportare l'intervento e di farsene promotori all'interno della popolazione. Infine, i gruppi di solidarietà già esistenti sul territorio appaiono un valido canale per facilitare l'accettazione dello schema di micro assicurazione sanitaria; queste associazioni presentano già una struttura di leadership e meccanismi interni di controllo.

4) La popolazione è favorevole verso schemi di mutuo aiuto.

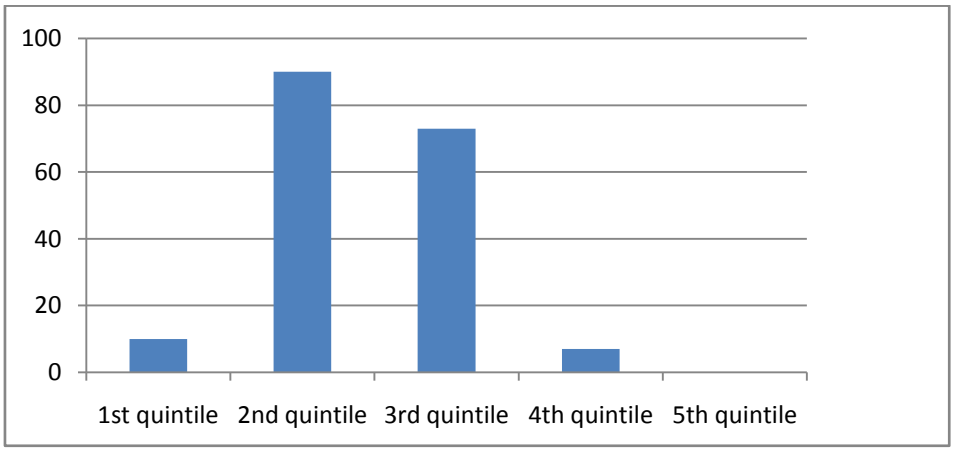
Le informazioni raccolte hanno dato prova di uno sviluppato spirito di solidarietà all'interno della popolazione locale: 484 gruppi comunitari sono stati registrati solamente nella zona pilota. Tramite interviste approfondite abbiamo potuto verificare che tali associazioni sono guidate da principi di mutuo aiuto e reciprocità, e si occupano principalmente di erogare piccoli prestiti e contributi di solidarietà, sia in denaro che in natura, ai membri in difficoltà. In particolare, esistono pratiche di mutuo aiuto estese anche a casi di malattia e maternità che rischiano di impoverire maggiormente le famiglie. I gruppi sono composti da un'eterogenea e ampia porzione di popolazione, che comprende in maggioranza donne. L'adesione di un membro garantisce comunque l'inclusione di tutta la sua famiglia per le attività di sostegno. Tale meccanismo, dunque, permetterebbe di introdurre ed estendere pratiche di solidarietà legate alle spese sanitarie dei membri del gruppo.

5) Esiste un generale trend di sviluppo socio-economico e la maggioranza della popolazione è capace di sostenere le spese assicurative tramite il prepagamento annuale di un premio.

Durante l'attuale fase di ripresa socio-economica che segue al periodo di conflitti interni, la popolazione locale svolge prevalentemente attività agricole di sussistenza; l'84% delle famiglie intervistate, infatti, non dichiara di avere altre fonti di reddito. La divisione in quintili della

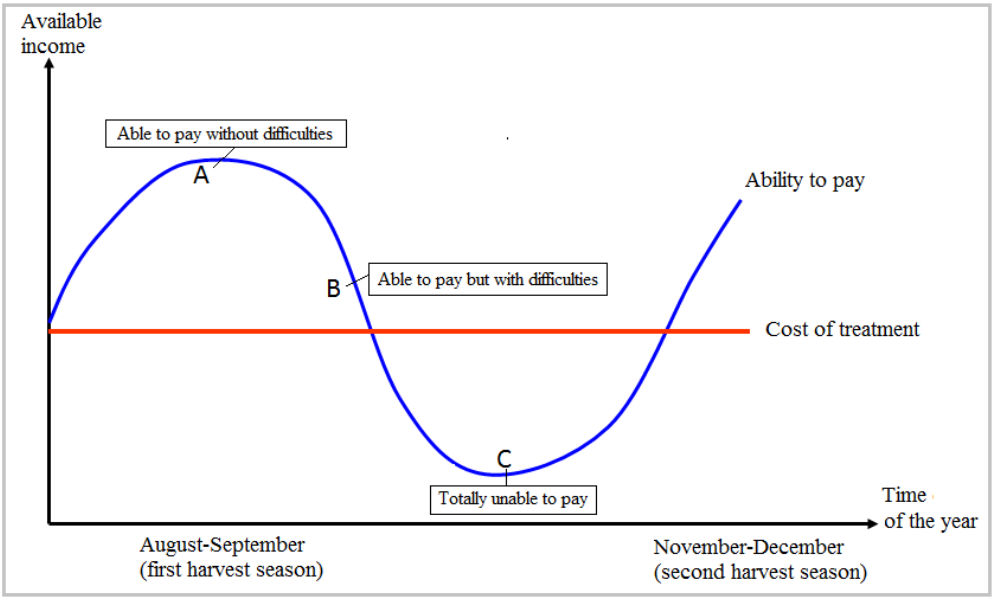
popolazione (Figura 2) conferma il profilo socio-economico dei piccoli agricoltori, che ricadono in gran parte tra il secondo e il terzo quintile; tale figura riflette un indice di ricchezza composito (Govule, 2015), realizzato aggregando 5 dimensioni specifiche di sviluppo socio-economico: materiale del tetto della casa, mezzi di trasporto, animali, terreni agricoli posseduti dalla famiglia e principali fonti di reddito.

Figura 2- Profilo socio-economico della popolazione.



Una volta calcolato un ipotetico premio annuale per famiglia di 49.769 UGX (circa 17.1 US$), è stato possibile verificare che la maggioranza delle famiglie locali è in grado di sostenere tale spesa. Assumendo infatti un reddito medio di 2 milioni UGX all'anno per una famiglia di agricoltori (Govule, 2015), il premio assicurativo rappresenterebbe il 3,1% del reddito totale. Tuttavia, date le fluttuazioni stagionali dei redditi agricoli (Figura 3), le modalità e tempistiche di riscossione del premio risultano fondamentali: i due periodi successivi ai mesi di raccolta (agosto e dicembre) potrebbero rappresentare un buon momento per finanziare l'assicurazione. Inoltre, la raccolta dei contributi sarebbe facilitata da una finestra temporale quanto più flessibile per il pagamento.

Figura 3- Fluttuazioni del reddito agricolo e abilità a pagare.



6) Il potenziale numero di membri è sufficientemente alto per garantire la copertura dei maggiori costi sanitari.

Secondo la letteratura (ILO, 2005) almeno il 25% della popolazione target dovrebbe essere coinvolta durante le prime fasi di progetto. La zona pilota del distretto dove è stato condotto lo studio conta circa 170.000 abitanti e 30.000 famiglie; tra queste, il 75% è già parte di un gruppo di solidarietà. Una buona mobilitazione a livello locale dovrebbe dunque avere come oggetto i gruppi di mutuo soccorso già esistenti, in modo da garantire continuità e sostenibilità alle pratiche di *risk-sharing* interne alla comunità.

4.1 CALCOLO DEL PREMIO ASSICURATIVO

Date le informazioni ottenute sia a livello di comunità sia a livello di strutture sanitarie, un ipotetico premio assicurativo è stato calcolato con riferimento alla letteratura esistente (ILO, 2005). In particolare, sono state utilizzati i seguenti dati:

-La probabilità di utilizzo del servizio sanitario (P), ottenuta combinando la percentuale di popolazione che può avere necessità di tale servizio e la frequenza attesa di utilizzo da parte di tale segmento;

-Il costo unitario medio del servizio (C).

Moltiplicando tali componenti per ogni singolo servizio (i) e aggregando i risultati per tutti i servizi inclusi nel pacchetto (n) abbiamo ottenuto il premio puro:

$$\text{Pure premium} = \sum_{i=1}^{n} (P_i * C_i)$$

Tale premio rappresenta il contributo che ogni membro dovrà pagare annualmente per coprire i bisogni della popolazione assicurata. Tuttavia, importanti studi (De Allegri, 2009) suggeriscono di introdurre una percentuale di co-pagamento da erogare direttamente al momento dell'utilizzo del servizio; tale meccanismo dovrebbe disincentivare comportamenti di abuso rispetto all'utilizzo dei servizi. Nel nostro caso abbiamo ipotizzato un tasso di co-pagamento del 20%.

$$\text{Pure premium} = \sum_{i=1}^{n} (P_i * C_i) * \text{Copayment}_i$$

Infine, alcuni costi di gestione devono essere aggiunti al premio puro per garantire un corretto funzionamento dello schema.

$$\text{Total premium} = \sum_{i=1}^{n} [\text{Pure premium}_i + 2 * (0{,}05 * \text{Pure premium}_i)]$$

Le statistiche di morbilità e frequenza di utilizzo dei servizi sono state ottenute incrociando i dati raccolti a livello di famiglie e quelli provenienti dai registri dei centri sanitari. Come concordato con i vari rappresentanti della popolazione, i servizi inclusi nel pacchetto ipotetico sono i seguenti:

-Servizi di maternità, incluse 4 visite prenatale (ANC), assistenza al parto e 1 visita post natale (PNC);

-Servizi ambulatori per bambini sotto i 5 anni;

-Ricoveri di emergenza;

-Trasporti di emergenza;

-Trattamento di cura per la Malaria.

Conclusione

L'implementazione di metodi misti per la raccolta dati ha rappresentato un valido approccio per impostare uno studio di fattibilità ex ante; i principali risultati sono stati combinati al fine di rispondere in modo sistematico alle domande di ricerca. Nel complesso, l'analisi dei dati ha verificato la validità di 6 specifiche condizioni di fattibilità all'interno del contesto locale: la salute è avvertita dalla popolazione come priorità e vi è una generale consapevolezza degli effetti di impoverimento legati alle spese sanitarie; i servizi erogati presso le strutture sanitarie sono considerati di buona qualità e, di fatto, la popolazione ha una buona reputazione dei vari attori legati al sistema sanitario locale, incluso il Cuamm. Uno sviluppato spirito di solidarietà è presente tra le

famiglie ed esistono già gruppi di mutuo aiuto a livello locale. Questi mostrano una struttura interna di leadership e di controllo sulle attività di supporto ai membri e sono stati dunque individuati quale valido canale per introdurre lo schema di micro assicurazione sanitaria. In generale, la popolazione è capace e ben disposta a pagare un ragionevole premio assicurativo a condizione che la raccolta dei contributi avvenga in periodi appropriati e con tempistiche flessibili; inoltre, l'inclusione della componente del trasporto nel pacchetto di servizi coperti dall'assicurazione garantirebbe una maggiore adesione allo schema. Infine, il numero di potenziali membri è sufficientemente alto per coprire le maggiori spese sanitarie e garantire così l'effettività di principi di *risk-pooling* e *risk-sharing*.

In conclusione, i risultati di questo studio hanno dimostrato che l'implementazione di uno schema di micro assicurazione sanitaria a livello comunitario è possibile nel distretto di Oyam; tale soluzione costituisce un valido sistema per migliorare l'accesso ai servizi sanitari da parte della popolazione locale e fornire protezione finanziaria in caso di malattia e maternità. L'analisi ha fornito utili indicazioni di policy riguardo il disegno dello schema e la sua buona riuscita. In particolare, un coinvolgimento attivo della comunità e l'adozione di uno spirito di continuità rispetto ai gruppi di solidarietà già esistenti sul territorio rappresentano attributi fondamentali per le prime fasi del progetto.

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APPENDICE 1: CALCOLO DEL PREMIO (UGX)

Services	CONSUMPTION					CONTRIBUTION			
	% of population	frequency	average cost	% paid by scheme	Co-payment	pure premium	safety load	management cost	Total
	A	B	C	D		= A x B x C x D	5%	5%	
Normal delivery	5%	0,174	30.000	80%	20%	208	10	10	229
Complicated delivery	5%	0,011	96.858	80%	20%	42	2	2	46
Cesarean section	5%	0,116	340.000	80%	20%	1.573	79	79	1.730
ANC visits	5%	1,080	1.000	80%	20%	43	2	2	48
PNC visit	5%	0,270	-	80%	20%	0	0	0	0
Under 5 OPD	20%	0,057	6.000	80%	20%	54	3	3	59
General admission	100%	0,035	115.653	80%	20%	3.195	160	160	3.515
Motorcycle transport for Emergency	100%	0,035	57.500	80%	20%	1.589	79	79	1.747
Visit	100%	0,019	2.000	80%	20%	31	2	2	34
Rapid Diagnostic Test	100%	0,019	3.000	80%	20%	46	2	2	51
Coartem treatment	100%	0,019	5.500	80%	20%	85	4	4	93
								Annual premium per person	7.552

	per person	per household
Annual premium	7.552	49.769
Bi-annual premium	3.776	24.884
Monthly premium	629	4.147

COMMUNITY INVOLVEMENT IN A LOW COST BIOGAS PLANT IN AN ANDEAN REGION

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Sommario

Lo scopo del presente lavoro è quello di investigare soluzioni tecnologiche sostenibili nel settore delle energie rinnovabili verso i paesi in via di sviluppo, dove la mancanza di risorse rappresenta una problematica sostanziale. Lo studio si concentra sul processo di produzione biogas attraverso impianti lowcost situati nella regione andina Apurimac, in Perù.
A completare questa analisi, è stato svolto uno studio di impatto sociale sulle comunità interessate valutando nel dettaglio il coinvolgimento di donne e bambini nella gestione dell'impianto, essendo infatti tale sistema considerato facente parte delle cosiddette "gender technologies", ovvero tecnologie in grado di promuovere la figura della donna nella comunità.

Abstract

The aim of the present paper is the investigation of suitable technological solutions in the field of renewable energies addressed to a developing country environment, where the lack of resources and means is a not negligible issue.
The study focuses on the development of biogas low-cost plants located in the Andean region of Apurimac.
A direct social impact on the community has been evaluated considering the working time and burden saving for women and children, belonging the biogas digester to a list of "gender technologies"[1], recognized as technology helping the improvement of women social and family status.

Keywords

Energy, biogas, Andean, comunity, technology

Introduction

The present work represents a deep investigation on suitable technological solutions in the field of renewable energies addressed to a developing country environment. Part of the work was made possible thanks to the collaboration between the University of Genoa and the association Apurimac Onlus, based in Rome.

In particular, the study focuses on the development of a project based on a biogas plant, characterized by low-cost technologies, located in the Andean region of Apurimac, in Perù.

This action has been taken after analysing the real situation of the people living in that region that were facing two main issues: the safe production and management of heat and energy and the recycling of waste of the everyday life.

According to this it has been evaluated that most of the time, women and children were involved in the production of energy, through the collection and harvesting of wood and other raw materials useful for the production of heat.

To this extent, the intervention has been made in order to find a good and suitable solution to face both challenges, and results have been conducted and then summarized as complementary study to the technical approach.

The main reason why the gas solution has been realized is it has been recognized in this project as the best solution to improve the living conditions of rural communities settled in Apurimac area, also taking into account the disadvantages that they have to face in such a complex and extraordinary environment.

Therefore, such project is presented at all stages of development, including the main technical parameters used in the plant realization. This topic has been deepened during many months of fieldwork in Peru, and the described work covers both the on-field activities and the subsequent related insights [2].

Social and environmental analysis

All the activities took place in the abovementioned Apurimac region, in the central-southern area of Peru. This region is characterized by little villages dislocated on the Andean mountain range, this fact causes many supply especially concerning medical assistance and, energy, raw materials and communication access.

Apurimac's surface is about 20.892 $km^2$and the main city is Abancay. The region takes its name from the Apurimac River which outlines the east border with the Cusco region points out Apurimac is the most deprived regions of Peru: in particular, the provinces concerned by the current project, Antabamba, Andahulyas and Vilcabamba, are some of the most disadvantaged; also the rate of illiteracy is an issue to be considered[3].

The environmental safeguard is a crucial issue of this region and this theme is strictly related to waste collection and energy supply, points that we would like to address in this paper.

Waste collection is almost non-existent, so that, outside the inhabited centres, it is common practice to deposit wastes in makeshift open-air landfill.

There isn't any precise institution planning on this issue and no specific education and regulation is applied in the area.

This last aspect creates serious environmental damages considering for example hospital or chemicals wastes and flammable substances that are not correctly stocked and disposed. Regarding the energy needs, great part of the region has no access to electricity, an example is the Antabamba province where only 43% of the population can directly access it.; the same happens in Grau province with an electrification of 50.7% [4]. The quality of the electric service is then very deprived, the energy is only supplied in some hours of the day and at very high prices, thus representing an unsustainable cost for residents and small businesses in the area.

Starting from these considerations a survey has been conducted in order to match the big problem of energy shortage with the rural resources of the rural villages.

Since mostly of the rural communities population of these areas lead lives centred on farming and agriculture activities, the developed idea was to exploit their natural resources and reinsert them in a virtuous circle of waste enhancement. From this analysis spins off the idea of installing a biogas plant, fed by livestock and biological wastes.

According to the TripleWins**Erreur ! Source du renvoi introuvable.**a sustainable development is linked to the correct management of some aspects linked to the progress of human wellbeing; it is about wealth creation that generates equality and opportunity; it is about consumption and production patterns that respect planetary boundaries and increasing tolerance and respect for human rights.

TripleWins development approach states how integrating social development with economic growth and environmental sustainability really brings to a sustainable development.

For this reason, this paper tries to approach the analysis of the project, counting on these three pillars of the sustainable development.

The technical approach

The choice of biogas digester has been made since it integrates perfectly in a family rural based economy; addressing in this sense the social development, while helping in management of the family economy, avoiding duties especially carried by for women and children; this is the reason the biogas is indeed produced through the fermentation of common organic substrates available in any temporary or permanent camp, such as organic refuses or human waste.

The biological and chemical process that stands behind the biogas production is called anaerobic digestion, that is the natural breakdown of organic material by micro-organisms in the absence of oxygen. The final results of this process are methane and carbon dioxide and in lower part oxygen, nitrogen and hydrogen sulphide.

Another secondary product of the anaerobic digestion is the digestate, the remaining material after the digestion process that can be used as a fertiliser.

The produced biogas is most often used as a cooking fuel, but can also be used to heat water or generate electricity for on-site use.

The concept of this small-scale biogas plant has been designed in order to not require invasive buildings and wide initial economical investment; the potential return, considering therefore the biogas plant as the main element of the recycle process in agricultural context, is very high.

Other advantages of this type of plant are the versatility, this technology allows to be set up easily and in a short time, and that the biogas production can start soon after the first organic matrix charge.

This entire process addresses both economic and environmental sustainability aspects, helping in recycling wastes and saving money for the community itself, saving time for collection of other fuel and at the same time educating people living in such a fragile area like the Andean Regions in caring about their health and, finally, about the landscape they can preserve.

The principal biogas plant features are related to the process that starts up the biogas production, the anaerobic digestion: the natural microbiological process whereby organic matter is decomposed in complete absence of oxygen. One of the results of this process is the biogas itself, a mixture of methane and carbon dioxide, usable as combustible gas. The biogas production closely depends from the quality of the reactor that guarantee the oxygen absence, this tank takes the name of bio digester.

Various groups of microorganisms are involved in the anaerobic degradation process which generates also another product, a nutritious digestate usable as fertilizer.

The biogas production has many environmental and economic benefits, the principals are the exploitation of a renewable energy, the greenhouse gases reduction, a reduced dependency on fossil fuels and closing of the nutrient cycle. This last point has an increased value and an evident social impact referring to rural context where it is possible to easy obtain organic matrix, such as from agriculture or farming, spreading independency conditions for dislocated and remote villages and families.

Therefore, the real advantage of the anaerobic digestion process is to transform organic waste material into valuable resources while at the same time reducing solid waste volume. Biogas also contributes to the preservation of the natural resources by reducing deforestation, due to firewood employment, and to environmental protection by reducing the usage of fossil fuels; it solves also another health related problem caused by the combustion smokes inside close ambient that could conduct to ophthalmic and respiratory diseases.

Technology description

The selected biogas plant has been the so called tubular digester (fig. 1), an insulated tank composed by a tubular plastic bag closed on both sides. This volume is laterally distended on the ground and the organic manner lays in its lower part; the inlet and outlet ducts are attached directly to the skin of the balloon at the two lateral sides. As a result of the longitudinal shape, the digested flow is conducted through the reactor in a plug-flow manner.
The organic matrix, inside this oxygen-free ambient, starts to be subjected to the anaerobic digestion process and, after a precise number of days principally defined by the internal temperature, to the biogas production. The biogas produced is collected in the upper part of the digester, increasing its pressure together with the biogas volume. At the desired pressure, in the order of few bar, the biogas is acquired and, after some different treatment in order to purify its chemical composition, it is stored ready to be used.

Fig. 1 - Low cost tubular biogas plant

These type of digesters need to be placed partially underground to ensure as much as possible the constant temperature and also to protect themselves from mechanical damage. Another expedient to

preserve the tubular tank is the creation of a structure around it that could also maintain more stable the inside temperature. For this reason, one of the benefit of these digesters is that they can be constructed at low cost by standardised prefabrication with no special planning activity.

Resuming the principal advantages and disadvantages of this technology a table is presented here below:

LOW COST TUBULAR BIOGAS PLANT	
ADVANTAGES	**DISADVANTAGES**
• Low cost construction	• Relative short lifespan
• Easy to construct and transport	• Susceptibility to mechanical damage
• High digester temperatures in warm climates	• Material usually not available locally
• Easy emptying and maintenance	• Low gas pressure requires extra weights
• High impact on health and hygienic conditions	• Scum cannot be removed from digester
• High impact on waste recycling	• Local craftsmen are rarely ableto repair a damaged balloon
• Shallow installation depth suitable for usein areas with a high groundwater table orhard bedrock	

Plant description

In order to get the best results for the community involved in the project, the general study of the technical settings is essential; in the following paragraph it will be analysed the optimal way and the economical outcomes of this installation.

The first crucial aspect to take into account is the positioning of the biodigester. The location of the reactor must consider the optimal orientation respect the solar orbit in order to collect as much solar radiation as possible. Defined this, the next step consists in the excavation of the protection trench for the tube digester, its dimensions depend strictly on the plant size. The four lateral trench walls are often projected to be inclined in order to avoid their crumble and to wrap the digester profile. It is important to define some geometrical criteria to optimize the structural strength of the construction, these information are available on literature as it is shown in fig. 2 [6].

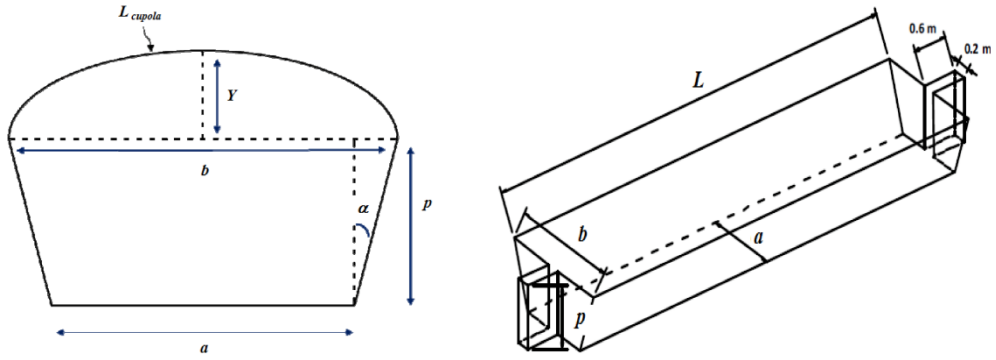

Fig. 2- Tubular section and trench geometries

The trench will protect the polyethylene structure for half high, the second part will be protected by a superficial wall, generally realized following the local building tradition. In the Andean context, like in most of the Latin America, this wall is built using the *adobe* technique, a mixture of soil, water and straw that is shaped thank to mold usage. The two lateral walls, placed on the two largest dimension of the tubular, are structured to permit the positioning of an inclined plastic surface on them in order to set up a greenhouse configuration. Obviously the optimal orientation is from East to West, and the optimal inclination of the plastic surface depends on the considered latitude, in the analysed case it is around 20°.

All the internal walls have to be covered by a thermal insulant, like polystyrene, in order to isolate the biodigester from the ground humidity, to limit the heat dissipation and also protect it.

The biodigester structure is realized using a tubular polyethylene roll, closed at the two lateral extremity with one PVC drainpipe of about 6'' for part. These two pipes are necessary for introduce the organic matrix inside the digester and to allow to the digestate material to flow outside. For the communicating vessel theory it is necessary to locate the inlet pipe in a higher position respect the outlet one.

On the top of the digester is also essential set up a third hole in order to spill the produced biogas flow.

The next construction phase is represented by the positioning of the digester inside the trench, it is important notice that this operation will be simpler with a slightly inflated digester. After that, it will be possible cover the structure with the plastic surface necessary to recreate the greenhouse effect around the biodigester [7].

The produced biogas will be connected to its final end-user device thanks to a pipeline that need some more elements all along its length, such as:

- *filter*: in order to limit the hydrogen sulphide content in the biogas, it is useful arrange a simple filter composed by a steel wool. The hydrogen sulphide could be very aggressive respect metal component of the system; to warranty a correct filtration process it is recommended to change the filter every 6 months.
- *gasometer*: it is an additional storage respect the gasholder of the tube digester, it is composed by a plastic bag of the desired volume. It is also very important for the managing of the biogas pressure before its utilization. These reservoirs are installed closely to the usage location, but must be always protected against flames, sun or wind. Generally, to increase the biogas pressure, some weights are located on the gasometer in order to compress the inside volume of gas for an increased combustible supply (fig.3 dx).
- *lock valve*: it is useful set up some lock valves all along the pipes in order to facilitate maintenance operations and other management actions.
- *condense drain*: it is important to fit a valve in order to drain out the condensed water inside the pipe lines. For this reason, it is fundamental put this drain-valve in the lower part of the plant so that the condensed water collection will be natural. In this manner, it is possible to open the valve and to let out the accumulated water. It is possible too, to make the supply line ever with an incline, so that the condensed water flows to the security valve.
- *pressure valve*: this valve allows to control the digester pressure exploiting the water column pressure contained inside a receptacle, like a simple plastic bottle. The biogas line is split in two lines with a t-fitting, one of these two arrive in the pressure valve. As higher is the water column as higher is the working digestor pressure, if this limit is exceeding, the biogas come out until the inside pressure became comparable to the water column one.

At the end of the pipelines composed by the described elements, it is arranged an end-user device to exploit the biogas combustion to produce heat or light. So, the main applications of this technology are domestic stoves (fig.3sx) and gas lamps. The focus of the present work has been on stove application, considering it higher impact on the examined community. Actually, as stated above, this type of application prevents many respiratory and ophthalmic diseases caused by indoor combustion for food preparation[8] [9, Pérez, Garfí, Cadena, Ferrer].

One of the principle characteristic of the described plant is its cost-effectiveness, the economic assessment of the tubular digester is principally related to the to the PVC membrane component, for example, a membrane realized for this type of application, has a cost of about 40 $/m^3. As previously described, it is also possible reduce this price, referring to the many publications and creating the digester starting from an open tubular PVC membrane and then adapt it in order to

make it airproof. The other elements, such as bricks and cement are accounted for 30% of the total cost, manpower is about 7% of total cost.

A critical aspect of this type of plant is the plastic component lifespan, that is around 5 – 7 years. While for other components the lifespan is about 20 years, the digester and the greenhouse plastic require to be changed after the first degradation signs.

In order to fix some point on the productivity of this technology an example is presented. A tubular digester of 10 m^3 can produce 1,2 m^3 per day, with 10 kg of volatile solid (the organic matrix fraction that actively contribute to biogas production) per day.

This amount of biogas can effectively contribute to the sustenance of a family, therefore, it can guarantee the utilization of a stove for 2 hours per day or the functioning of a lamp for 10 hours per day.

Fig. 3 - Stove fed by biogas and biogas gasometer

Considering all these aspects it is relevant underline that support the diffusion of this technology in specific geographical areas and in specific social and environmental contexts, could be a good argument to promote the development of rural communities, empowering the lives of inhabitants, especially of the weakest part of the population, usually involved in domestic issues and eventually consequent damages and accidents.

Conclusion

The paper aim is to investigate the impact of a specific technology on an Andean rural community. Such technology exploits the potential of the anaerobic digestion and consists of a low cost biogas plant. The effectiveness of this type of installation is mainly characterized by a simple maintenance

and management, and by a very well integrated process inside the reference context. This technological inclusion in a specific geographical area is a good example of foreign aid project since it has considered the social aspects necessary for the proper long term community development.

The Triple Wins approach has been favourable in analysing the project, evaluating the positive social impact together with a better energy efficiency and an economic growth, making the people able to extract energy form wastes. The good results of this project came out while people of neighbourhood of the principal village involved, came to visit the plant in order to replicate it.

The indirect impact states in a practical spread of waste reuse and management, so possibly bringing to new policies (and maybe laws) regarding the waste collection and recycling.

Form the health point of view, using biogas helps in slowing down smoke produced by burning wood or wastes in an uncontrolled way, de facto helping reduction of bad smokes and bettering the air condition along with that the pulmonary diseases.

All in all the impact, although still not measurable in terms of economic growth, is positive on the entire community and a long term assessment will give more and more details on the impact and measurable aspects could be took in consideration in order to produce documents able to analyse and replicate this case history of success.

Acknowledgment

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INTEGRATING REMOTE SENSING AND CENSUS INFORMATION FOR LAND SECURING IN NORD KIVU, DRC

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Sommario

La competizione per l'uso della risorsa territoriale è considerata motivo scatenante e fattore perpetuante dei conflitti nella parte orientale della Repubblica Democratica del Congo (RDC). La letteratura esistente dimostra che il telerilevamento (RS) è uno strumento utile per monitorare sistematicamente le dinamiche spazio-temporali di uso e copertura del suolo in molte regioni del mondo. Per tale ragione in questo studio proponiamo una metodologia per l'integrazione di informazioni provenienti da diverse fonti, in particolare il telerilevamento e le interviste condotte in campo, volta alla messa a punto di un sistema spaziale di supporto alle decisioni finalizzato alla valutazione multicriteriale di potenziali siti pilota per lo sviluppo agricolo e il re-insediamento di rifugiati congolesi.

Abstract

Land disputes are considered both key sources and perpetuating factors of conflict in the eastern Democratic Republic of the Congo (DRC). Existing literature demonstrates that remote sensing (RS) is a useful tool for systematically monitor the spatial-temporal land use/land cover dynamics in many regions of the world. For this reason, in this paper we propose a methodology for the integration of different sources of information, namely satellite imagery and census information, in order to set up a Spatial Decision Support System aimed at Multi-Criteria Evaluation of potential pilot sites for agricultural development and refugees resettlement.

Introduction

East-DRC : Historical background

Since the Democratic Republic of Congo (DRC) is one of the richest countries in the world in terms of natural resources (ADB, 2009; Bwana, 2011), the control of lands in the region has always been at the core of profound disputes (Naidoo, 2003).

In such a context of internal and external economic interests, land disputes can be considered obviously both as sources and perpetuating factors of conflict in the eastern DRC (Verweijen &

Marijnen, 2016). The most visible land-related conflicts, contributing to large-scale violence, are those that put ethnic communities against each other. However, other forms of land-related conflict are very widespread, including community-level conflicts between farmers and large-scale concessionaires, between rural communities and mining companies, between pastoralists and farmers, and between national parks institutions and surrounding populations. While generally accompanied by low levels of violence, the grievances related to such conflicts often impact on the security and stability at the local level (Mathys & Vlassenroot, 2016).

The weakness of land legislation, associated with widespread corruption, led to a massive alienation of lands under the two existing land tenure systems, namely customary and statutory tenures. On the other hand, the Government has already signed a huge number of international agreements with multinational companies for large-scale land exploitation projects, mostly for mining and biofuel production (Landmatrix, 2017). These two causes brought to an incredibly difficult situation for the increasing population of the region who now is cornered in the less productive areas (Frankema & Buelens, 2013).

The situation is even more complicated by the huge number of refugees in the region. According to OCHA, some 430,000 refugees from the DRC are still living in neighbouring countries, including Burundi, Uganda, the United Republic of Tanzania and Rwanda (Externally Displaced Persons – EDP). The humanitarian profile of North Kivu, in particular, is alarming, with an estimated 863,400 internally displaced persons (IDP) between January 2009 and November 2014. All these people have the right to return to their home, as declared by several International Treaties concerning human rights in general and the refugee condition in particular (CIRGL, 2006).

For all these reasons, the agenda of international organizations dealing with peace seeking and keeping in the Eastern Congo are now focusing, among other issues, on drawing a clear sketch of land tenure and land ownership distribution in the region.

The project "Land Securisation in the Goma Dioceses"

The Department of Agricultural and Environmental Sciences (DISAA) of the University of Milan, is involved with Caritas Goma NGO in a three-years project called "Land Securisation in the Goma Dioceses" (LSGD), funded by the European Commission. The LSGD project aims, among other goals, at identifying reference pilot areas suitable for the re-settlement of Congolese refugees actually residing in Rwanda.

Identification of settlement sites is always a complex matter and, in such a region, it needs increased awareness of complex interactions among humans, environment, and potential land management decisions. This kind of complex decision making creates a demand for integrated multidisciplinary decision support tools within a spatial framework (Baker, Miller, & Paige, 2009).

On this assumption, the LSGD project is exploiting innovative methodologies, such as satellite remote sensing (RS) techniques, to provide new cartographic and thematic land use informative layers. In addition, the LSGD project is conducting an important data gathering effort over the target area (Diocese of Goma, 26223 km^2) in order to collect detailed information about existing agricultural resources, conflicts, and potentialities. Therefore, in the framework of the LSGD project the DISAA proposes the set up of a Spatial Decision Support System (SDSS) aimed at Multi Criteria Evaluation (MCE) for the identification of pilot zones.

Spatial Decision Support Systems and Remote Sensing

SDSSs are GIS-based models that "enhances a person or group's ability to make decisions" (Power, Sharda, & Burstein, 2015). As tools for improving evidence-based choices, SDSS are widely used in several sectors such as policy making, enterprise management, environmental studies and more recently sustainable development studies. As GIS-based systems, SDSSs are made of a geo-referenced database that is merged with a DSS which in turn is often related to some kind of Multi Criteria Analysis (MCA) (Chakhar & Mousseau, 2007).

Generally speaking, SDSS are widely used in order to tackle land development choices (Agatsiva & Oroda, 2002). Experiences in the East Africa region are reported bysevera authors (Baldyga, Miller, Driese, & Gichaba, 2008).

In the framework of International Cooperation for Development, and namely among the programs and projects funded by the EU, other experiences of SDSS development also exist (ITC, 2015; Janusz, 2016; Manakos & Braun, 2014; Refsgaard et al., 1998; Uyan, Cay, & Akcakaya, 2013). Satellite image has been used so far to classify and map land cover and land use changes with different techniques and data sets. Unsupervised and supervised approaches are the most commonly adopted for satellite images classification (Butt, Shabbir, Ahmad, & Aziz, 2015; Lu, Mausel, Brondizio, & Moran, 2004; Rundquist, Narumalani, & Narayanan, 2001; Zhang, Zhang, & Zhang, 2000).

The application of supervised approaches implies that the user or image analyst "supervises" the pixel classification process by specifying which pixels values or spectral signatures should be

associated with each class according to known representative sample sites, called Training Sites. The "trained" algorithm is then able to classify the whole image. Precision of supervised classification depends heavily on the training sites, the skills of the expert who process the image, and the spectral distinctness of the classes.

A variety of supervised classification methods have been developed and applied to satellite images for land use mapping. Among these, some applications were specifically designed for land use monitoring in the DRC. Important examples are the contribution of Hansen et al., (Hansen et al., 2008) which focused on the use of Landsat images to map forest land-cover typologies exploiting unsupervised decision tree approach. They succeed in validating maps having 75% of overall accuracy. Duveiller et al., (Duveiller, Defourny, Desclée, & Mayaux, 2008) instead, focused on deforestation mapping in central Africa in the period 2000-2010 applying unsupervised object-based classification procedures to Landsat images. The overall accuracy estimated for their thematic products was 91%. Vancustem et al., (Vancutsem, Pekel, Evrard, Malaisse, & Defourny, 2009) proposed a semi-automatic classification of SPOT (Satellite Pour l' Observation de la Terre) temporal-spectral information, to produce a map discerning 18 vegetation types in the DRC.

An additional source of land-use information is census data, which has recently been explored for its relationship to remotely sensed imagery (Cardille & Foley, 2003). Land use/cover changes have been identified as a useful tool to aid the process of understanding human-environment interaction (Dale, Oneill, Pedlowski, & Southworth, 1993). Thematic and census land use descriptors can be integrated in a geographical information system (GIS) on the base of a given administrative level.

Scope of the paper

This paper is focussed on the use of RS to collect data on the land cover/use, on the collection of the Census data on the ground, and on the potentiality of merging these two sources of information in order to support the multicriteria choice of pilot zones. Therefore, the final scope of this work is the set up a SDSS for the identification of pilot zones, based on the multicriteria evaluation (MCE) of land hosting capability. In order to indentify zones with "good" hosting capability, the LSDG project has defined several criteria. The principal criteria considered are presented in figure 1, where the scheme of the proposed SDSS is shown.

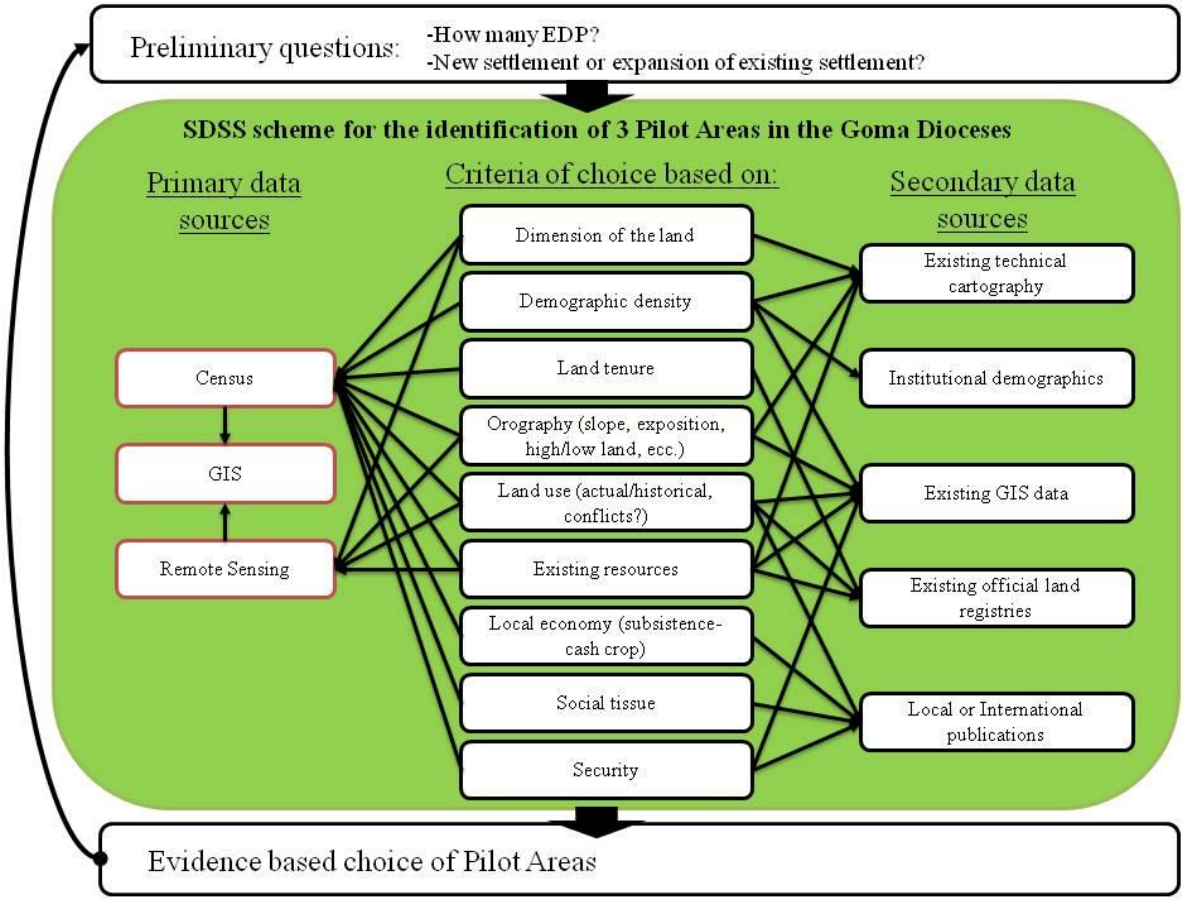

Figure 1- Scheme of the SDSS draft for the evidence based identification of LSGD project pilot zones, containing a list of the principal choice criteria which have been considered in this work.

It clearly appears how the choice of pilot areas depends on several criteria whose measurement relies on different data sources, both primary and secondary.

Three administrative units, named "collectives" of Wanyanga, Bakano and Bashali, placed in the study area of the Goma Dioceses (GD), have been selected on the base of the available Census results for this preliminary methodological test. The methodological approach concerns the integration in GIS environment of land use products derived by RS and detailed census data about existing agricultural resources, potentialities and existing conflicts. The generated land use knowledge is therefore used to build useful evidences for the identification of pilot zones and, generally speaking, to foster peace-seeking operations in the region.

Preliminary results highlight how the integration of different information sources lead to: (i) cross-validation between sources, (ii) identification of conflicting information between sources, and (iii) creation of emergent information stemming from the joining of the two sources.

Results, proposed in form of thematic maps and aggregations of census survey data, are discussed formulating new research perspectives in view of more detailed land hosting capability evaluation to be conducted in the project framework.

Materials

Study area

Our attention focused on the DRC (fig. 2A). Here, the administrative subdivision is as follows: the national territory is divided into Provinces, the province into Districts and Cities, the district into Territories, the territory into Local Communities (or collectives or collectivities), the local community into Groups, and the group into Villages (Comité Provincial-SRP du Nord-Kivu, 2005).
In addition we have to take in consideration a supplementary hierarchical subdivision of the national territory, namely the ecclesiastical administrative subdivision. In fact, in this paper, the administrative level of collectives is used in order to merge the data from the RS and the data from the Census which are instead collected at lower levels of the ecclesiastical subdivision (Shirika).
The study area corresponds to the rural area of the Dioceses of Goma (GD), which is part of the Ecclesiastical province of Bukavu and which is composed of 23 parishes. Each parish is composed of several branches. These branches, also called in Swahili "Kigigi", are not an exclusively ecclesial administrative units, because they correspond also to a pre-existing territorial division based on customary traditions. In each branch's territory, people are grouped in local ecclesial communities called Shirika. Kigigis in the GD are numbered at 105. Inside each collectivity, the project estimates an average number of Shirika equal to 305, but this number varies according to the fact that Shirika are dynamic groups of people and not once-for-all-defined territorial units.
Specifically, the target area of LSGD project, namely the GD (surface: 26 223 km^2), lays in the North Kivu Region and in a tiny strip of South Kivu Region, from Minova to Nyabibwe (fig. 2B). Inside the Dioceses there are 11 collectives appertaining to 5 territories (Goma, Rutshuru, Masisi, Walikale, Kalehe).
The present paper focuses on three collectives belonging to the GD: Bakano, Bashali and Wanyanga. These administrations cover respectively the 16.2% (4 251 km^2), the 4.4% (1 144 km^2) and the 39.9% (10 487 km^2) of the Dioceses (fig. 2C).

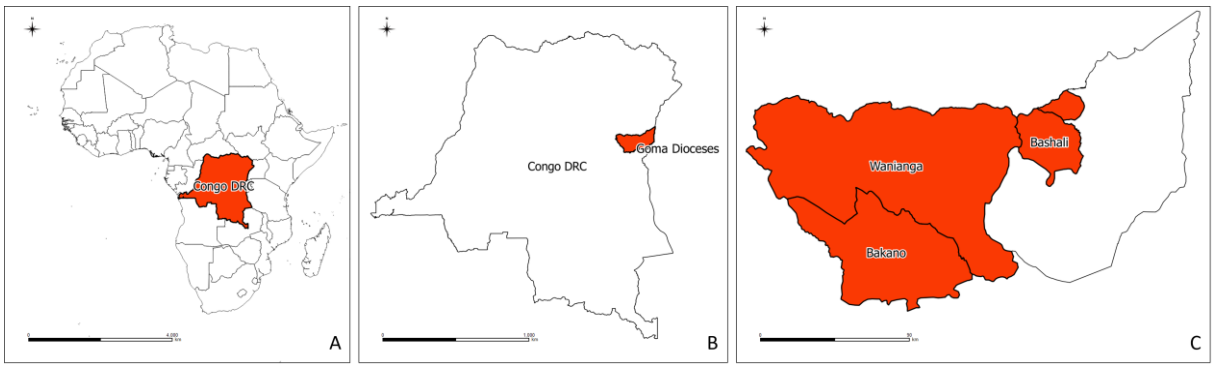

Figure 2 – Geographic positioning of the three collectives representing the investigated study sites. The DRC, Africa (A); the Goma Dioceses, in the Congo DRC' North Kivu region (B); the collectives of Wanyanga, Bakano and Bashali.

Ground reference data

In the Nord Kivu region, different land tenures correspond to different land use/cover patterns: while large concessions result in large, uniform territorial units typically covered by monoculture plantations or pastures, smallholders typically own small plots which result in fragmented, heterogeneous territorial units. This diversity in land use and ownership determines a meaningful land cover pattern in the region.

A data collection campaign was conducted in May 2017 in the GD with the purpose of collecting GPS points concerning different land use classes. A total of 110 polygons of surveyed areas were drown from the GPS point sample collection and successively used to train and test supervised classification algorithms. The polygons are representative for a total area of 904.3 ha. Table 1 summarizes the main information survey database features by listing the four land use classes as well as the number of polygons drown for each class and the respective area of concern.

Observed land use	**Available polygons**	**Total area [ha]**
Agriculture	39	343.4
Anthropic	25	131
Forest	12	20.6
Pasture	34	409.3
Total	110	904.3

Tab. 1 - Summary of the information collected in the geo-database produced through a field survey activity carried out in May 2017.

Satellite data

Eight Sentinel-2A satellite images, covering together the entire surface of GD were downloaded from the European Space agency (ESA) Copernicus open access hub archive (https://scihub.copernicus.eu/). In particular, we exploited level 1C (L1C) Sentinel images, provided as a set of tiles of 100 square kilometres. These products contain applied radiometric and geometric corrections (including orto-rectification and spatial registration). We selected the less cloud-contaminated acquisitions for each tile during the reference year 2017. Details on spatial resolution and the different spectral acquisition bands available in Sentinel-2A L1C images are shown in figure 3.

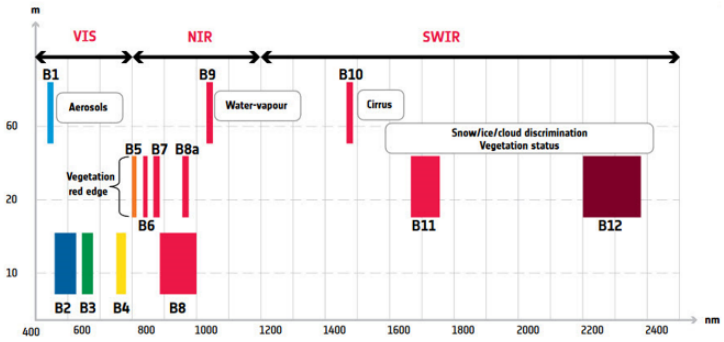

Figure 3 – Spatial resolution versus wavelength intervals of Sentinel-2A images. Sensor span of 13 spectral bands from the visible and the near-infrared to the short wave infrared at different spatial resolutions (pixel size) ranging from 10 to 60 m. (source http://esamultimedia.esa.int/docs/Earthobservation/Sentinel-2_ESA_Bulletin161.pdf)

A Digital Elevation Model (DEM) provided by the NASA Shuttle Radar Topographic Mission (SRTM - http://srtm.csi.cgiar.org) was used to gather information about altitude and slopes characterizing the area of study (Jarvis, H.I., Reuter, Nelson, & Guevara, 2016).

Census information

The LSGD project has a strong preliminary component related to sensitization about land tenure issues in front of EDP/IDP return. In the framework of these activities aimed at building a positive environment for the implementation the whole project, a survey in the GD was carried out by 8 field supervisors of Caritas Goma NGO. The structure of the survey form is resumed in table 2 while collected information is resumed in table 5. The survey aimed at collecting at least one interview per each Shirika in the GD, which are estimated to be about 305 per collectivity. The survey was scheduled between May 2016 and December 2017. This paper reports the results of the first 73

interviews that were dispensed between May and August 2016 in 73 Shirika laying in three collectives, as reported in table 3.

Tab. 2 - Structure and contents of the Survey form used for gathering information about existing agricultural resources, conflicts, and potentialities

Topics	**Questions**	**Description**
General information on the Shirika	4	Features of the Shirika (with a focus on co-existing ethnic groups).
Land ownership and land use	2	Land uses and land owners.
Soil erosion	9	Soil erosion: its presence and its intensity
Agricultural land use	2	Agriculture: crops, depending on the type of land owner.
Information about land tenure in owned/vacant lands	3	Land tenure on owned/vacant lands.
Existing value chains (production-marketing)	5	Local production/consumption chain.
Other activities	5	Other peculiar activities eventually existing in the Shirika
Externally displaced people and land	8	Willingness of resident population to manage the re-settlement of externally displaced people.
Internally displaced people and land	8	Willingness of resident population to manage the re-settlement of internally displaced people.

Tab. 3- Number of interviews per Shirika in each target collectivity-territory-province.

Province	**Territory**	**Collectivity**	**Interviewed chiefs of Shirika**
Nord Kivu	Walikale	Bakano	29
Nord Kivu	Masisi	Bashali	167
Nord Kivu	Walikale	Wanyanga	143
Total			339

Method

The applied methodology involved an independent processing of two different data sources and their successive integration in GIS environment. From one hand, remote sensed satellite images were analyzed with the aim to produce land use maps of the three communities of interest. On the other hand, census data were gathered, organized in a database and finally summarized at collectivity level. Once retrieved at the same spatial level, data sources were integrated by overlapping them in a GIS environment and were used to build a SDSS based on MCE of land hosting capability towards the return of Congolese EDP. Figure 4 proposes a flow chart of the main methodological steps followed in the proposed methodology.

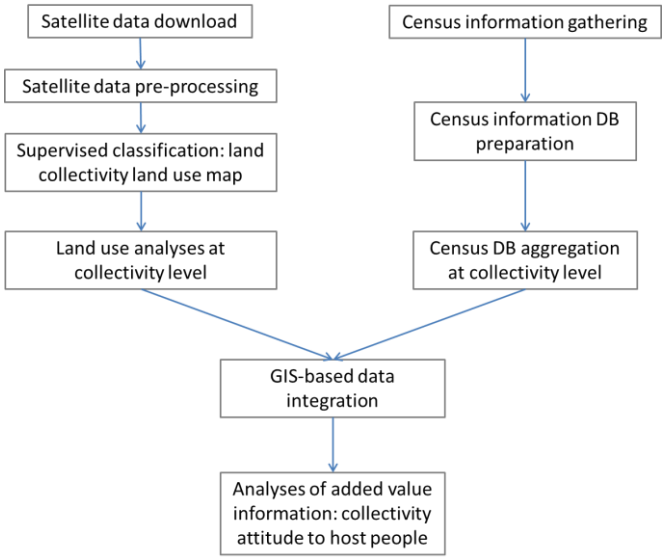

Figure 4 - Flow-chart summarizing the main phases of the designed methodology.

Analyses of Satellite data

A selection and download of the best available cloud free Sentinel-2 images were conducted on the ESA web catalog (January-June 2017 time window). Eight images entirely covering the GD were chosen.

A preliminary image pre-processing phase was carried out on selected images by resampling all the images spectral bands components at a 10-m resolution and subsequently by creating a composite mosaic as cloud-free as possible of the GD.

The mosaic was then classified using a Spectral Angle Mapper (SAM) supervised classifier (Kruse et al., 1993). All the Sentinel-2A bands with native spatial resolution of 10 -m and 20-m were used as independent input variables in the classification procedure.

We used 50% of the data to train the algorithm (calibration) and the other 50% for testing the land use map (validation) produced by the supervised classification. Four target classes were formalized to be automatically mapped by the SAM algorithm. The classes were: (a) pastoral land use, (b) forest, (c) agricultural land use and (d) anthropic land use areas.

A thematic land use map of the GD represented the output of the classification phase. A pixel-to-pixel comparison between the validation dataset (reference data) and the land use map (estimated data) was then conducted using the error matrix methodology (Brivio, Lechi, & Zilioli, 2006; Congalton, 1991). After the validation, three map resizes were made in correspondence of Wanyanga, Bakano and Bashali communities and statistics related to the percentage distribution of the estimated land use classes were compiled.

Analyses of Census data

Data from the first 73 paper questionnaires were preliminarily analyzed through participative approach: one *ad hoc* focus group was organized in collaboration with the whole survey staff in Caritas Goma headquarter during May 2017. This first participatory analysis of the data served as a first-glance assessment of the integrity and internal consistency of the survey data. This step made it possible to highlight some critical issue in the survey form and in the data flow toward sources integration. The 73 questionnaires were manually digitalized and recorded in an electronic database. Among the possible aggregation levels, determined by the existing administrative units and related GIS reference data, the collectivity (or collective) level was chosen as a good compromise between clarity of the exposition and ease in the overlay of the data from satellite and census. After the creation of this preliminary database and the choice of a consistent aggregation level, data were analyzed with the software Stata (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.).

Integration of remote sensed and census data

The integration of data form Census and RS was approached in two steps:

Firstly, a simple synoptic table, as show in the Results section (figure 7), was built and analysed in ad hoc participatory sessions with the aim of systematically identifying important relations between data from the two sources.

Secondly, on the base of emerged relations and themes, data were merged in a GIS environment by using the collectivity aggregation level in order to produce thematic maps.

Results:

Collective-level land use maps

Figure 5 shows Sentinel-2A reflectance average response to four land use classes of interest in Goma as depicted in the calibration database. Pastoral land use (figure 5A) showed the higher spectral signature response (i.e. the most reflective land use typology, figure 5E), the signature was similar to the forest and agricultural land uses, but with higher magnitude. Forest spectral signature (figure 5B) behalf similarly to the agriculture land use (figure 5C), with differences mainly marked in the Short Wave Infra-Red region (SWIR) between 1200 nm to 2200 nm and corresponding to Sentinel-2 bands b11 and b12. For this portion of the spectra, forest land covers were more reflective than the agricultural one (figure 5E). Anthropic areas showed the lower spectral signature (i.e. the less reflective, figure 5E), with the lover differences between the Red (around 650 nm, Sentinel-2 band b4) and NIR (around 850 nm, Sentinel-2 band b8) regions due to the absence of photosynthetic activity and having almost the same reflectance values from 800 nm to 2200 nm (figure 5D). All the spectral signatures presented reflectance maximum values in the NIR region (Sentinel-2 band b8).

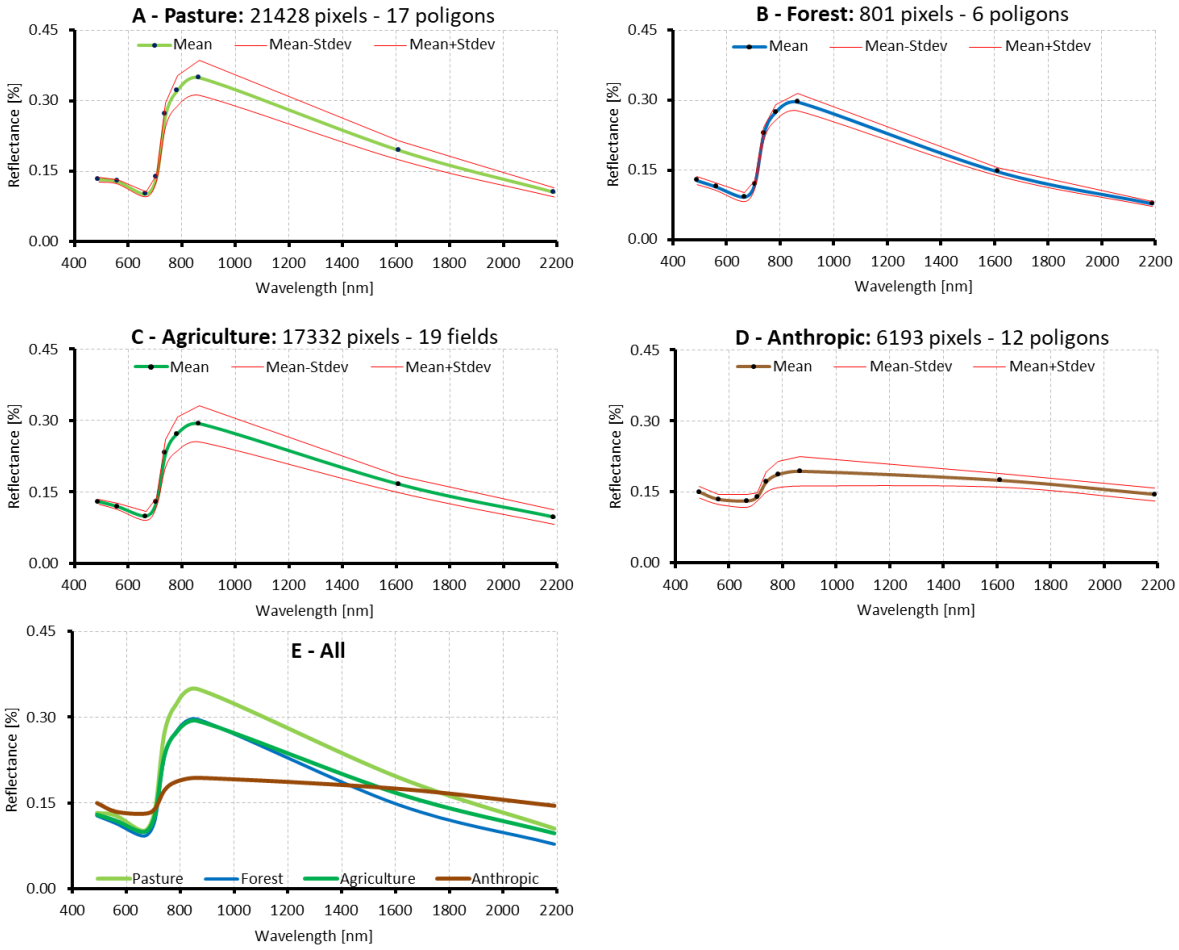

Figure 5 – Training dataset. Average Sentinel-2 reflectance responses and standard deviations for four land use classes. (a) Pastoral land use, (b) forest land use, (c) agricultural land use, (d) anthropic land use, (e) all the target classes together.

Table 4 shows the validation results of the retrieved land use map for the study area of the Goma. This classification result has to be considered a preliminary methodological exercise, mainly devoted to set-up the broad project's methodological framework rather than maximize its single component performances. Given this, the classification reached an overall accuracy of 66% meaning 66/100 cases of agreement between field data and RS classification. The anthropic and pasture land use classes, were mapped with acceptable levels of omission and commission errors, lower or equal to 29%. Further improvements are needed with reference to both agricultural and forest land use estimations, which was conservatively classified in view of decreasing mutual misclassification.

Tab.4 – Error matrix showing a pixel-by-pixel comparison between the validation dataset (reference dada) and the thematic classification map (estimated data). CE: commission error, OE: omission error, OA: overall accuracy.

	validation data				*accuracy indicators*		
	Agriculture	Anthropic	Forest	Pasture	CE	OE	OA
Land use map:	[px]	[px]	[px]	[px]	[%]	[%]	[%]
Agriculture	17802	2079	528	4337	28	42	66
Anthropic	51	7565	0	0	1	29	-
Forest	9615	652	1350	551	89	28	-
Pasture	3472	351	8	14647	21	25	-

The SAM classifier allowed the production of a land use map of the study area. This map was resized for target collectives: Wanyanga (figure 6A), Bashali (figure 6B) and Bakano (figure 6C).
With reference to the whole GD (map not reported), the classification mapped a relevant presence of forest that counts for 74% of the study area (around 19 405 km^2). The agricultural land use were instead identified on 20% of the map surface (5 244 km^2) and were mainly concentrated near rivers and streets. Pastoral and anthropic land uses were mapped in low percentages, with 5% (1 311 Km^2) and 1% (262 km^2) respectively. For the collectivity of Wanyanga (figure 6A) a higher presence of forest (+13%) and a lower presence of agricultural land use (-8%) were found in comparison with the entire dioceses. In the Eastern part of the collectivity, a higher presence of agricultural land use was mapped. In the central part instead, it is possible to note some cloud and cloud shadow noises. These represent for our purposes an unavoidable loss of land use information. Figure 6B shows the land use map of Bashali, this collectivity has land use proportions in line with the Goma study area. Although a marked presence of cloud contamination, it is possible to note a predominant presence of forests in the Western side as well as a predominant presence of agricultural land use on the Eastern side. In the Northeastern part of Bashali the algorithm identified the presence of pastoral land use and in the Southeastern the presence of three main water bodies. These latter, are presumably volcanic lakes. The land use map of Bakano (figure 6C) reported a strong presence of forest (15% more than the entire GD) and a minor presence (-9%) of agricultural land use. This was mainly concentrated in the central part of the map, along the East to West direction, and in the South.

In addition to the land use information, we also obtained data concerning average (AVG) elevation and slope for the study area of Goma and for the three collectives we focused on. The SRTM dataset showed for Goma AVG elevation of 1299 m and 3.33% AVG slope. Weather for the three collectivities: 1026 with 2.59% (Wanyanga), 1626 with 4,53% (Bashali) and 1056 with 2.44% (Bakano) for the AVG elevation and the AVG slope respectively.

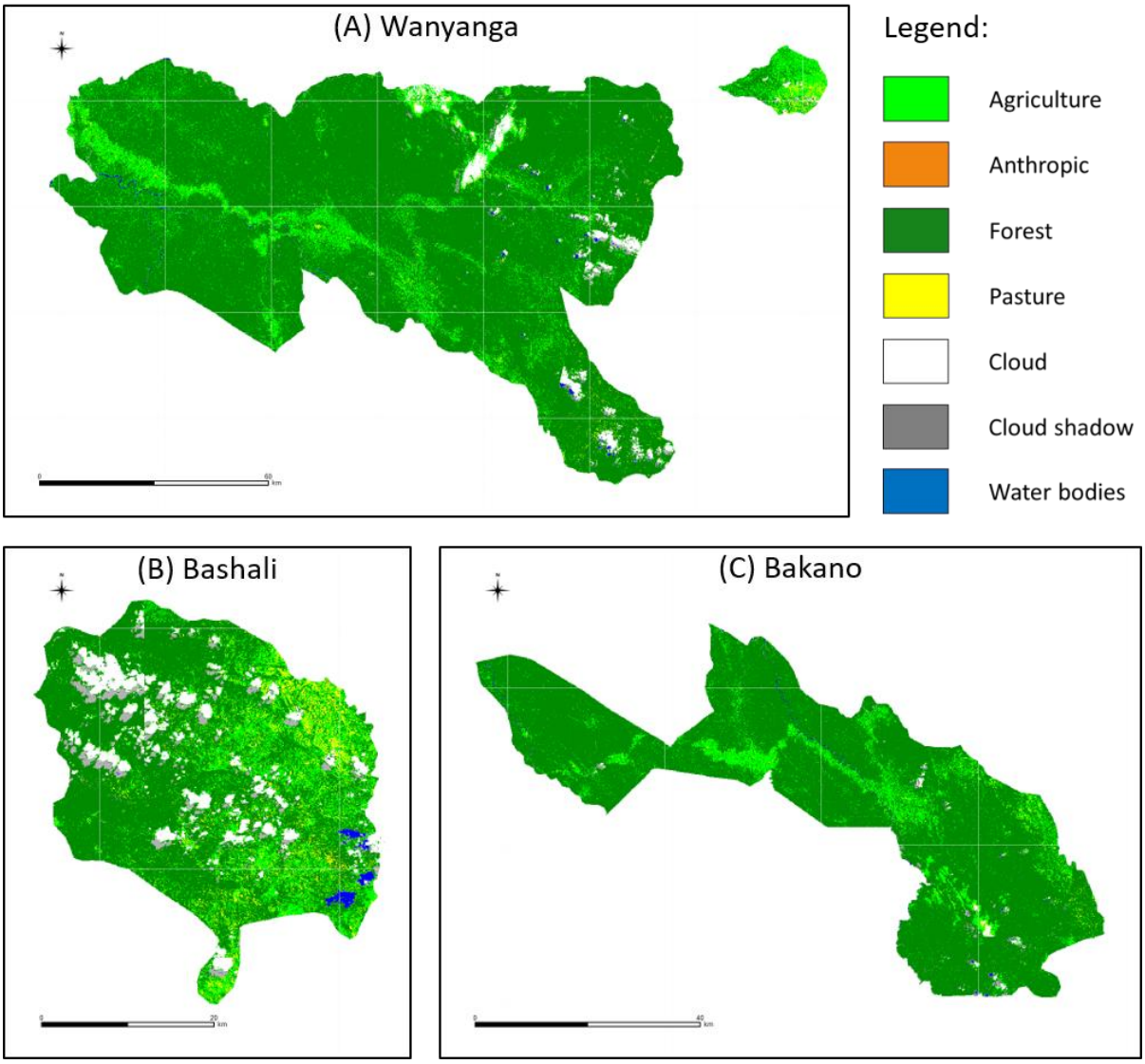

Figure 6 – Resize of the land use map of GD for the three collectives object of this study: (A) Wanyanga, (B) Bakano and (C) Bashali. The legend reports four target land uses (agricultural, anthropic, forest and pastoral), map sources of noise (cloud and cloud shadow) and water bodies.

Aggregation of census data at the collectivity level

In table 5 some results of the census are shown for the three target collectivities, together with some results of the GIS and Remote Sensing analysis.

In relation to its surface, Bashali is the most densely populated community and respondents mention few erosion problems, seasonal water scarcity, few conflicts over the land and apparently no land appertaining to EDP/IDP. Moreover, according to respondents, Bashali shows the lowest propensity to the return of EDP/IDP even if vacant lands seem to be available.

The Collectivity of Bakano is characterized by the lowest population density, low level of conflict even if vacant lands are not available, seasonal water scarcity, no presence of lands appertaining to EDP/IDP and no will for them to settle back.

The collectivity of Wanyanga shows 13,8 inhabitants for square kilometre, diffused erosion phenomenon, seasonal water scarcity, presence of conflicts over the lands even if vacant lands seem to be available. Similarly to the other two other collectivities Wanyanga's respondents are not willing to accept the return of EDP/IDP.

Tab.5- Census results aggregated for the three target collectivities.

	Bakano		**Bashali**		**Wanyanga**		**Total**	
Surface (Sq.km)	4251		1144		10487		15882	
Population (Inhab.)	16584		17292		145024		178900	
Pop. density (Inhab./Sq.km)	3,9		15,1		13,8		11,3	
Number of interviews	**Bakano**		**Bashali**		**Wanyanga**		**Totale**	
	Count	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
	29	9%	167	49%	143	42%	339	100%
Question	**Answers**							
1. Is soil erosion a problem in the area?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
N	13	45%	58	35%	108	76%	179	53%
Y	16	55%	109	65%	35	24%	160	47%
Tot.	29	100%	167	100%	143	100%	339	100%
2. Is there water yearly-round (as flow or well) ?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
N	1	3%	6	4%	4	3%	11	3%
Y	28	97%	158	96%	139	97%	325	97%
Tot.	29	100%	164	100%	143	100%	336	100%
3. Are there vacant lands?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**

N	10	34%	153	92%	121	85%	284	84%
Y	19	66%	14	8%	22	15%	55	16%
Tot.	29	100%	167	100%	143	100%	339	100%
4. Do conflicts over land exist in the area?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
N	5	17%	76	46%	97	68%	178	53%
Y	24	83%	89	54%	45	32%	158	47%
Tot.	29	100%	165	100%	142	100%	336	100%
5. Are there any land appertaining to EDP/IDP in the area?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
N	0	0%	8	6%	0	0%	8	4%
Y	15	100%	134	94%	70	100%	219	96%
Tot.	15	100%	142	100%	70	100%	227	100%
6. Is the resident population willing to accept the return of EDP/IDP?	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
N	9	38%	16	11%	57	42%	82	27%
Y	15	63%	133	89%	79	58%	227	73%
Tot.	24	100%	149	100%	136	100%	309	100%

Data integration

The data coming from the two sources (Census and Remote Sensing) were firstly integrated in a synoptic table (Table 13), and successively through the ARCGIS software by using the smallest administrative unit available on GIS maps (MONUSCO, 2016), namely the "collectivity" administrative unit.

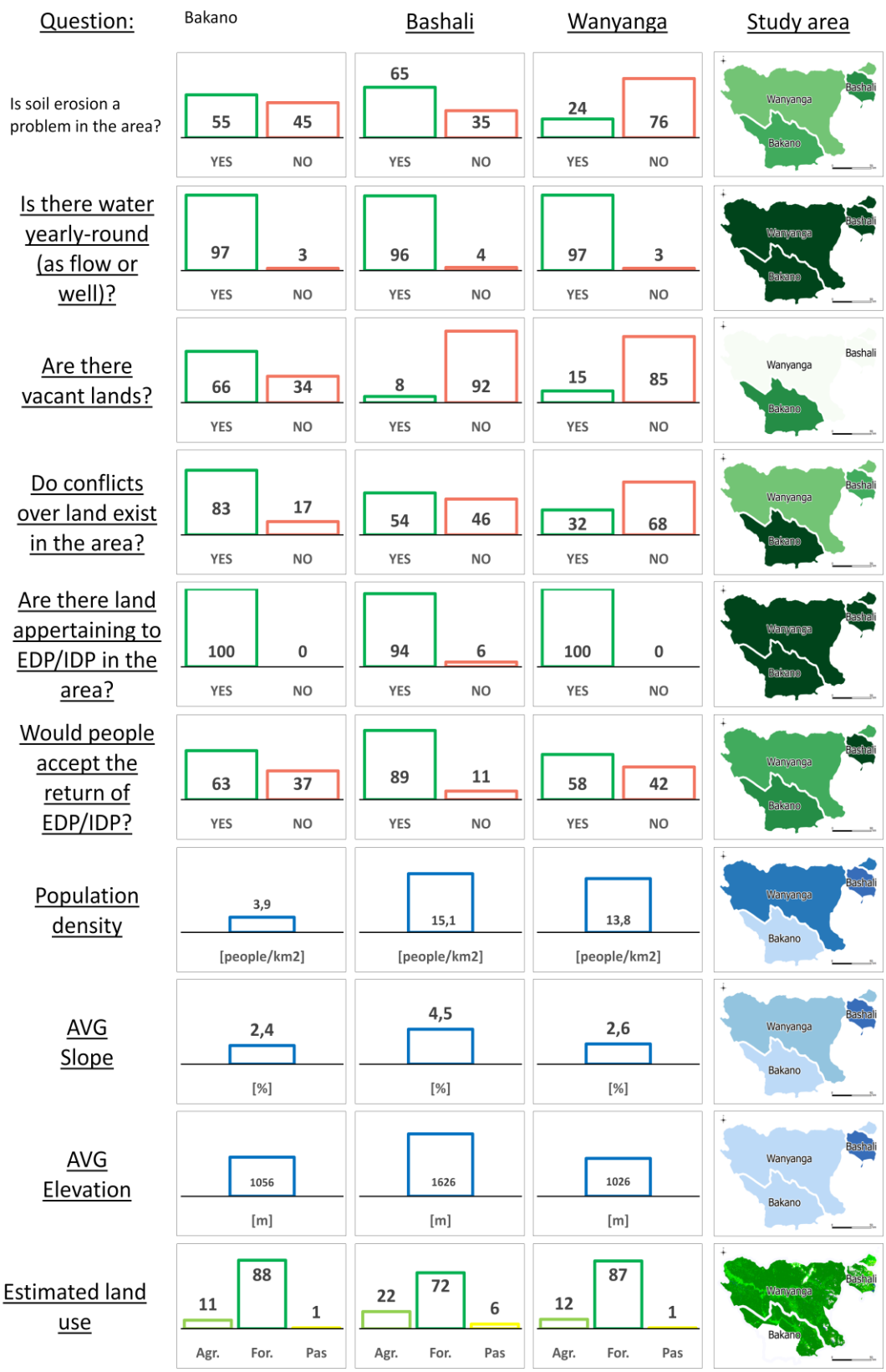

Figure7 - Data integration for the two sources, presented as histograms of different features and corresponding colored layers of the three target collectives (Bakano, Bashali and Wanyanga).

Discussions and conclusions:

Through the implementation of the proposed methodology, we obtained the integration of different sources of information, respectively based on remotely-sensed images and on the field survey.

The proposed methodology, even in this preliminary phase, is able to overlay different data sources and therefore allows multicriteria evidence-based considerations.

In fact, the overlay of information provided by the two sources produced "added" information that is useful to support the MCE of land hosting capacities and the identification of potentially suitable pilot areas.

It is interesting to remark that the coupling of the two information sources is able to support the process, as a SDSS, in different ways and at different degrees. In fact, the overlay of the two sources produces results that can be classified according to the following three cases.

1. Case of mutual confirmation: the two sources confirm each other and therefore bring to a stronger knowledge base.
2. Case of contradiction: the two sources contradict each other. This case underlines critical issues in the project' knowledge base or in the proposed methodology for data integration.
3. Case of "added value": it represents the main goal of the methodological approach. The two sources of information allow the creation of additional information "over the simple sum of the parts", which leads to more complex evaluations.

As an example of this third case, which is strongly desirable in the study, we can make the case of Bashali collective. The proposed methodology works as a SDSS tool by integrating the data related to all the proposed criteria (table 1). In particular, if we only consider the oral knowledge collected during field visits, Bashali is the richest collectivity among the three target collectivities and therefore is one of the sound zones where to propose a pilot and where the "suitable conditions for the refugees' return may already exist". If we take in consideration the results of RS analyses, at first glance, the Bashali collectivity has a higher presence of agricultural and pastoral land, and could therefore be confirmed as the best collectivity where to propose a pilot. On the contrary, coupling the information from RS with census data, it clearly appears that Bashali is also the most densely populated collectivity, the one with more lands appertaining to missing EDP/IDP and the one that shows the lowest presence of vacant lands. Even if most of the respondents in Bashali show a positive attitude toward the return of refugees, the composite information we can draw from the overlay of sources may explain the medium-high presence of conflicts over land use. Then, if we

also take in consideration the average slope of the collectivity, we can add another item to the reflexion and therefore resize our interest on this collectivity to be the host of one of the pilots.

This evidence based, "added knowledge" about Bashali is possible only if projects like the LSGD adopts a SDSS based on MCE, as the one drafted in the present paper.

Further research will be conducted in the framework of the LSDG project, and more detailed information to support the choice of pilot zones will be produced. A next step will be the use of a multi-temporal analysis approach in the analysis of satellite images. As a matter of fact, agricultural and pastoral land extensions in Bashali are higher than in other collectives (as can be observed by RS). As we know from literature and as we confirmed with our census, Bashali collectivity, and Masisi territory as a whole, suffers from chronic disputes over land tenure, because all the lands are already exploited. Land conflict in Masisi are often generated by the dichotomy farmers-pastoralists where farmers are in majority smallholders while pastoralist areas are dominated by huge, under-exploited, concessions. The RS methodology implemented in this first step-methodological approach is still not able to produce land cover classes on the base of the difference between landscape patterns, but this results will be obtained with multi-temporal analysis in the second phase of the project. The information obtained, joined with information collected by census about vacant lands and existence/features of large concessions will allow to strengthen the proposed SDSS.

However, it is crucial to stress that, in a complex situation as the Nord Kivu's one, any decision about the re-settlement of IDP/EDP should be preceded by a strong consultation process with local people and institutions, and in this sense the SDSS results can constitute only a discussion base for supporting these operations.

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SESSIONE 4
IMMIGRAZIONE: MULTICULTURALISMO E NUOVE STRUTTURE SOCIOECONOMICHE

INTRODUZIONE

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I sei contributi presentati nella sessione affrontano in modo pertinente il tema "*Immigrazione: multiculturalismo e nuove strutture socio-economiche*", anche se da differenti punti di vista, in linea con le diverse provenienze degli autori: due relazioni proposte da economisti, altre due provenienti dall'area sanitaria, una offerta da una specialista di lingue e una da una esperta di progetti di cooperazione allo sviluppo.

Da tale insieme è emersa chiaramente una prima osservazione: il fenomeno delle migrazioni interessa propriamente più aree scientifiche e, di conseguenza, fattori, anche importanti, dello stesso *possono* essere trattati in modo opportuno nell'ambito di differenti discipline. Tuttavia, tale fenomeno, per poter essere colto nel suo orizzonte più adeguato, che è profondamente interdisciplinare, *deve* essere guardato da più prospettive. Meglio se allo stesso tempo. Questo è anche uno dei maggiori apporti offerti da momenti di dialogo che ospitano diversi approcci disciplinari, quale quello qui riportato.

Prova ne è anche il fatto che i sei contributi mostrano fili conduttori forti. Il primo inerisce il desiderio di impegnarsi nell'affermazione positiva delle differenze e delle alterità che si incontrano operando in ambito di migrazioni. Lo studio di Franco Locatelli, Alessia Montanari, Chiara Schiavo, Sabina Tangerini, Mattia Viano e Marilena Bertini è interamente imperniato sulla necessità del riconoscimento delle differenze culturali per poter essere in grado di offrire servizi sanitari corrispondenti al reale bisogno di ognuno e di tutti. La ricerca di Maria Vittoria Calvi sul panorama linguistico di alcune vie di Milano, nell'analizzare le diverse modalità nelle quali l'ambiente viene segnato da materiali in molteplici idiomi e in differenti maniere dalle varie comunità di migranti, elabora tesi sulla diversità espressa da tali comunità, rilevando allo stesso tempo come ognuno dia un'impronta soggettiva ai propri atti linguistici.

Il saggio di Sandro Rinauro offre invece un'analisi dell'interazione tra migrazione regolare e mercato del lavoro in Italia nella presente congiuntura economica, individuando alcuni trend e segnalando tra essi quelli che ritiene più rilevanti. L'aspetto forse più preoccupante che emerge, in relazione allo sviluppo del Paese, è quello relativo all'alta percentuale dei migranti che, avendo vissuto e operato in Italia per più di dieci anni, decidono di espatriare nuovamente: è un capitale umano, sociale ed economico che nel nostro Paese cresce e matura ma che poi, a un certo punto, decide di investire altrove. E questa decisione viene presaanche peril peggioramento delle condizioni di lavoro e dello standard di vita in Italia,effetti della crisi. La questione è preoccupante perché coloro che decidono di andarsene sono persone che avevano consolidato la loro posizione sociale in Italia ed erano nelle condizioni adatte per contribuire all'economia e allo sviluppo del Paese. È una sfida che non possiamo evitare di raccogliere. Particolarmente interessanti sono anche gli affondi di genere e quello relativo alle famiglie che si dividono, con un adulto che rimane in Italia in attesa di ritrovare lavoro, l'adulto con maggiori chance, e l'altro che torna in patria con i figli, interrompendo così il percorso educativo e di istruzione dei bambini che si erano inseriti nei sistemi scolastici italiani.

Alcuni testi approfondiscono poi soprattutto il riconoscimento costruttivo delle differenze culturali e sociali che si riscontrano nei contesti migratori. Il riferimento è innanzitutto al caso citato da Arianna Barazzetti, Pietro Barbetta, Paolo Pressato, Rita Finco e Fulgenzio Rossi di un rifugiato traumatizzato dopo il percorso migratorio sulla rotta libica. Costuiinizia l'elaborazione del trauma con l'aiuto di un'equipe che mette in atto un intervento multifocale tenendo conto,tramite mediatori culturali che parlano la sua lingua, del contesto culturale nel quale è stato traumatizzato. Una volta iniziata l'elaborazione del suo trauma, il rifugiato decide di lavorare a supporto dell'equipe che incontra i migranti traumatizzati per sostenerli nel percorso di cura equesto impegno diminuisce i suoi disturbi e gli permette di evitare trattamenti farmacologici. In tale direzione si muove anche il contributo di Alberto Brugnoli e Matteo Matteini che presentano vari quadri analitici dei contesti migratori e individuano nella valorizzazione delle sinergie tra economia circolare e migrazione circolare l'elemento che possa permettere di sviluppare traiettorie produttive e inclusive, in controtendenza rispetto al pensiero, spesso assecondato dai media, che insiste sulle dinamiche migratorie soprattutto come fonte di pericoli, favorendo un clima di paura che, a ben guardare, è poco giustificato. Un modello di sviluppo sostenibile nel tempo deve fondarsi sulle circolarità ed è opportuno cogliere anche le importanti opportunità offerte dal contesto migratorio.

Infine, l'articolo presentato da Maria Alessandra Verrienti sulle ricerche svolte all'interno di alcuni progetti realizzati dalla ONG CIFA nel Wollo in Etiopia con il finanziamento dell'Agenzia Italiana

per la Cooperazione allo Sviluppo offre elementi per comprendere quali siano i circuiti informativi che spingono le persone a partire dall'Etiopia per un viaggio così pericoloso quale è quello per l'Europa. Lo studio individua anche alcune proposte di azione, tra le quali insegnare ai locali ad investire le rimesse che provengono dai migranti; promuovere strumenti finanziari per l'investimento delle rimesse stesse; disegnare politiche per la migrazione giovanile per contrastare i "viaggi della morte", offrendo così prospettive più sicure. Inoltre, poiché i più poveri non migrano, è ormai assodato che generare una certa ricchezza non diminuisce di per sé i processi migratori; di conseguenza solo una cooperazione finalizzata all'eradicazione della povertà che opera con un approccio allo sviluppo di lungo periodo (e non unicamente alla soluzione dell'emergenza) può favorire, nel tempo, un equilibrato affronto di tali dinamiche. Infine, viene rilevata una forte distorsione del *Pull Factor*: l'idea che chi parte avrà un futuro promettente in Europa va sempre più consolidandosi, forse anche perché sostenuta dall'enorme business che esiste sul traffico della migrazione clandestina. In merito, sempre più decisiva può risultare un'adeguata informazione nei luoghi di partenza.

In conclusione, vale la pena segnalare due questioni, già ben presenti nei diversi contributi, ma ampiamente richiamate e approfondite nel corso del dialogo che si è aperto a conclusione delle presentazioni. La prima è che tutti i differenti approcci disciplinari hanno fortemente sottolineato l'importanza del *capitale umano* e del *capitale sociale* delle persone che migrano e dei contesti che le accompagnano e le ricevono, quali elementi decisivi per l'adeguato affronto delle dinamiche in corso. La seconda è che tali dinamiche non potranno essere opportunamente governate se i *modelli di governance* a esse applicati non saranno fortemente partecipati da tutti i vari stakeholder. È soprattutto a partire dall'investimento in questi capitali e in questi modelli di governance che è possibile garantire una convivenza civile e generare nel tempo uno sviluppo sostenibile per l'Italia, anche in collaborazione con coloro che forse ad alcuni oggi sembrano "gli altri".

ETHNOCLINIC: LANGUAGES, MIGRATIONS, IDENTITIES

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Sommario

Ci proponiamo di descrivere le pratiche ed esperienze etnocliniche, intese come luogo di ascolto e conversazione terapeutica. Nel nostro lavoro con megranti, rifugiati e richiedenti asilo viene utilizzato un modello che include diverse professioni, ognuna delle quali possiede specifiche competenze: psicoterapeuti, psicologi clinici, psichiatri, antropologi, educatori e pedagogisti. Ci riferiamo ad un'epistemologia che trae origine dall'etnopischiatra e dalla psicologia culturale prendendone altresì le distanze rispetto ad alcune peculiari visioni.

Abstract

Our purpose is to describe the ethnoclinic experiences and practices, meant as a place of listening and therapeutic conversation. In our work, with migrants, refugees and asylum seekers, we use a model that involves several practitioners, each with multiples skills: psychotherapists, clinical psychologists, psychiatrists, anthropologists, educators and pedagogues. We are referring to the epistemology origined by ethnopsychiatry and by cultural psychology. Nevertheless, we move away from these disciplines, as soon as the meeting between practitioners and migrants does not fall into the presumption of replacing the traditional health care practices, as happened due to the ethonopsychiatric ingenuities.

Keywords
Ethnoclinic, migrants, refugees, systemic approach, languages.

Introduction

Our purpose is to describe the ethnoclinic experiences and practices, meant as a place of listening and therapeutic conversation. In our work, with migrants, refugees and asylum seekers, we use a model that involves several practitioners, each with multiples skills: psychotherapists, clinical psychologists, psychiatrists, anthropologists, educators and pedagogues.

We are referring to the epistemology origined by ethnopsychiatry and by cultural psychology. Nevertheless, we move away from these disciplines, as soon as the meeting between practitioners and migrants does not fall into the presumption of replacing the traditional health care practices, as happened due to the ethonopsychiatric ingenuities. Moreover, we do not consider the plurilingualism matter solely in cognitive terms (addictive/subtractive bilinguism).

Ethnoclinic questions the role of the linguistic mediator, in virtue of the fact that the language babel appears to be a complex phenomenon. We find, in these contexts, vernacular languages, vehicular languages, colonial languages, matrix languages, mother tongues and step mother tongues (the language of the host country). All these languages are interlinked within the individual, a dimension that can only be singular.

Working in migratory, cultural and ethnic contexts brings us to underline that the classical linguistic distinctions, as any attempt of categorization performed to costruct and to describe the reality, inevitably lead to approximate and insufficient results. Starting from this statement, we discover that we have no option but create new concepts that allow the emergence of new derivation lines. This emergence allows us to start from the accident, from theand from the singular situation that each migrant brings with her/himself and that we could find in any encounter. In our speech, we would like to consider also some aspects linked with the migrants' families, in turn related to the "migratory project". Migrating also means changing one's own identity, and this fact certainly has relevant ontological implications on multiple levels.

Nevertheless, migration is one of the essential and prevailing aspects of humanity, suggesting to think in terms of "human becoming" rather than "human being".

Theoretical framing

Working in cultural and ethnic contexts allows to meet people, languages and societies significantly different among each other, inevitably leading to question the classical linguistical categories which went along with our studies, our theorizations, our pratices and, generally, all the operations through which we can find a coincidence between production of categories and *real* world, what lies *out there* (Barbetta 2015).

Moreover, working in migratory contexts brings us to underline that the classical linguistic distinctions, as any attempt of categorization performed to costruct and to describe the reality, inevitably lead to approximate and insufficient results. Starting from this statement, we discover that we have no option but create new concepts that allow the emergence of new derivation lines.

This emergence allows us to start from the accident, from the case and from the singular situation that each migrant brings with her/himself and that we could find in any encounter.

Categorizations, inevitably, produce simplifications: if, on one hand, they help us tidying, structuring, and creating efficient hierarchizations more or less controllable and easiliy replicable, on the other hand they risk to produce trivialities and determinisms in case we forget to replace them soon, preferring to fall in love with them and to continuously use them. We see then maximizaztion processes (Bateson, 1972), of standard repetition with eliminates differences (Deleuze, 1994). As we face a migrant, or an asylum seeker, or a refugee our classifications, linguistical in primis, are checkmated. Through the look of the Other psychoterapists, clinical psycologists, antropologists, educators, pedagogists and psychiatrists meet themselves, naked: which languages are we speaking then, and within which discourse horizons are we located? How to meet a resonance and a co-transfert (Barbetta, 2010) between the idiom of the person who decided to come to us and ours? How to try to create, to realize a generativity among languages?

Ethnoclinic questions the role of the linguistic mediator, in virtue of the fact that the language babel appears to be a complex phenomenon. We find, in these contexts, vernacular languages, vehicular languages, colonial languages, matrix languages, mother tongues and step mother tongues (the language of the host country). All these languages are interlinked within the individual, a dimension that can only be singular. To avoid a mere reproduction of categories we do not consider the plurilingualism matter solely in cognitive terms: we decided to go past the use of classical cognitive behavioural theories since these introduce ideas like bilinguisms of addictive type and subtractive type. In the same way, we tried to push beyond theorizations, often charged with naiveness linked to etnopsychiatry preferring, instead, to refer to a methodology capable of considering a constitutive temporariness of the same concepts, i.e. their use referred to the specific case.

To do this, we are referring to the epistemology origined by ethnopsychiatry and by cultural psychology. Nevertheless, we move away from these disciplines, as soon as the meeting between practitioners and migrants does not fall into the presumption of replacing the traditional health care practices, as happened due to the ethonopsychiatric ingenuities. We referred, among the others, to the Deleuze and Guattari's theorizations (Deleuze; Guattari, 1987) which, involving the use of multiple *series* (Deleuze, 1990) allow to create generalizations always provisional, and not predefined.

Furthermore, this allowed us to move with freedom between the example and the peculiar event, starting from the accident, from the nuance, from the concrete observa
tion of a conversational exchange (Barbetta, 2015).

Therefore, three series emerge at least (Ibidem). The first one is the series that could be credited to schizophrenic language. Consider, for example, the Louis Wolfson case. He was born in New York. He was unable to hear the language of his birthplace and his mother tongue. Wolfson invented a certain type of *Walkman* (Wolfson, 2012) and, besides, a particular method or a procedure (Deleuze, 1997) by the study of languages. This method consistes of a complex and refined transformation from english lemmas to several foreign words. The procedure works on the phonetic and semantic level.

Therefore, we could hypothesize that English, so painful and impossible to hear idiom for the schizophrenic student of languages (Wolfson, 1970), is not his *mother tongue*, but it is the *tongue of the mother*. English is a dominant language, that devastating him, it drills his brain, it is a subjugation and interpellation language; a stepmother tongue.

Instead, the *mother tongue* would be the Jewish which is the *father tongue*, as well. The other several languages that Wolfson had used are *adoption languages*, particularly the French language through which Wolfson wrote his first romances and essays (Barbetta, 2015; Barbetta e Valtellina, 2014).

The second series concerns the dialects, the local expressive forms and the accents. It concerns the language of roots and the roots of language. For this topic, we can find several references and masters, for example, in Pier Paolo Pasolini and Carlo Emilio Gadda's productions.

Romances, films, theatrical works and literatures contribute to the co-creation of the languages, persons, senses and wishes into a reciprocal dance of recalls, contaminations and hybridizations (Barbetta; Brevini, 2008).

The last series pertains to the migrant's language (Barbetta, 2015). This series places, at least, two issues. The first one concerns the migrant's family, that is immersed in a so-called migratory project. This is a delicate and complex issue, since, most of the time, the fossilized categorization of the migratory project does not include the continue and intrinsic transformativity of human being. Clearly, the presumed identities and univocities are checkmated by this transformativity.

But migrating also means changing one's own identity, and this fact certainly has relevant ontological implications on multiple levels. Nevertheless, migration is one of the essential and prevailing aspects of humanity, suggesting to think in terms of "human becoming" rather than "human being". L'essereumanodiventadunquedivenireumano (Barbetta; Tofanetti, 2006).

The last one, concernes the learning of a language at adult age and the linguistics distances that resulting from the adulthood position. Both these aspects, analyzed and declined in therapeutics, multidisciplinares and ethnoclinics contexts, seems to affect in a coevolutive way on creation of generatives and curatives exchanges (Barbetta, 2012; Inglese, Cardamone, 2017).

The purpose of this speech is to describe the ethnoclinic experiences and practices, meant as a place of listening and therapeutic conversation. Moreover, in our speech we would like to consider also some aspects linked with the migrants' families, in turn related to the *migratory project*.

Based on the above-mentioned considerations, we intend to show two clinical cases through which we will try to highlight some elements and virtous circles of transformativity and of therapeutical creation emerging in the care and attention to little details, either linguist, proxemics, linked to desire and affectivity.

In our work, with migrants, refugees and asylum seekers, we use a model that involves several practitioners, each with multiples skills: the etnoclinicaléquipe working in Bergamo is originally composed of a psychotherapist, a psychiatrist and a pedagogist; however it also comprises other consultants and external practitioners like educators, clinical psychologists, anthropologists and further psychotherapists.

Clinical case

John comes from Ghana. In 2013, he worked as bricklayer in Libya. In 2014 the war explodes in the area in which John was working. After few days, the costruction site was hit by a bomb. Also other three colleagues were there with him and the device deflagrated near them. Fortunately, John was situated in a more distance and protected position compared to his colleagues. J. fainted and, when he regained consciousness, he found the lifeless bodies of his colleagues besides him. At first, John thought that his injuries was not so serious. However, the next day, deep cuts and bulge appeared. Still today, he brings some scars of that event. Since he was unabble to access to the hospital, John medicated himself by unguents and pomades.

J. is in Italy since 2015 and recently, one reception centre, near Bergamo, has received him. Since the early days, many nightmares tormented him. In John's sleeps the scene of the deflagration recurs every night. This nightmares keep him awake all night long, causing severe migraines throughout the following day.

The team decided to investigate the dream content in a deep way. J. reports to see four persons; they are his colleagues with him. Suddenly, he finds the dead bodies of his three colleagues, in that moment he wakes up and he is not able to fall in sleep again.

But, in another dream, John saw a different scene. "*I was in Libya accompanied with three friends of mine. We were walking together in order to reach a sort of building. Then we saw a door and they tried to convince me to enter. I did not want to enter, but they persisted more.* […] *I was in doubt, I felt something wrong. Suddenly, I heard a far away voice calling me. That voice said:*

"Come here!", "Don't listen them", "Don't enter!". It was the educator's voice of my reception centre, Angela. I followed the voice and I did not enter. Then, I woke up."

The equipe wonders if someone in the John's family was opposed to his departure to Libya. John told that no one was informed about his departure, since all his relatives would try to stop him. When he was arrived in Libya, he phoned his mother who implored him to come back. Actually, John's departure dipended on his desire to contribute to his brother's studies and if J. was came back his brother could not had been complete the university. "*I have a strong bond with my mother. It has been so difficult to disobey to her. While she was begging me to come back, I kept silent because I knew about the situation of my brother and, in this way, I would helped him."*

The equipehyphotesized the parallelism between Angela and John's mother. Both the women are salvific figures, that warn John about potential dangers. John's dreams become, in this way, his consolatory part that has to do with volition. After this discussion, John was able to sleep better.

At the second encounter, the equipe tries to reconstruct his story with a new meaning. John's departure was deeply different from departure of other migrants, whom ran way from wars, from tortures, from threats or from a probable death. John has chosen to leave his country with an ethical spirit. His aim was to help his brother to study and this purpose was so important for him that he even had to go against his mother.

After these encounters, John feels better, particulary, he said to us, thanks to the discourse about his dream. Now John helps his companions and some activities in the centre are organized by him. In this way John is taking care of the others, like a kind of therapist.

Conclusions

In reception interventions, in favor of refugees and asylum-seekers, a constant diplomacy work, between heterogeneous world, is requested. In this global situation, we often find some ideals that create risks of mutual suspicionor imminent collision. Our experiences show how the reception interventions could assume preventive and therapeutical valences, which could riduce the traumatic effects of war, emergencies, tortures, violences. These interventions should be carried out in a cultural and sensible way, using all local available resources.

In a social enlarged exchange, these interventions can promote a collective and communitarian reconstruction, starting from the valorisation of cultural systems, which are constitutive of hosted groups.

The reception processes should have able to place all persons,that are participating as beneficiaries, in an autonomous and active position. This movement starts from the recognition of linguistic, cultural and personal skills of all persons involved.

At the same time, psychotherapists, clinical psychologists, psychiatrists, anthropologists, educators and pedagogues are called to a mediation practice towards hosting contexts, in order to avoid the xenophobic recjetion of the stranger. This practice could be carried out towards more persons, on different levels. Some of these levels could be the central structures, the local istitutions, economic and productive resources of the district and, at last, with the entire population.

The suitable way consists in implementing a model of intervention that is able to articulate the clinical functions, that are careful to the war and violence effects, with the social functions of the hospitality of refugees and asylum-seekers into the new context, within a framework that integrates an ethnoclinic approach with a global mental health approach.

This methodological perspective, based on the constructioning of a wide social supporting frame and on multiligual platforms of exchange, should offer new possibilities of relationships to the human hosted groups. In this way we could help them to leave the suspended and stuck life, in which the migrants could risk to be.At the same time, we have to pay attention on the danger that the contact with other cultures does not generate some xenophatic sufferings in the local comunities, that are able to create form of rejection, manifest or veiled.

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DELIVERING CULTURAL-SENSITIVE HEALTH SERVICES

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Sommario

La competenza culturale è un insieme di attitudini, capacità, comportamenti e strategie che permettono di lavorare con efficienza in situazioni di incrocio culturale.
I servizi sanitari si trovano a dover garantire adeguata assistenza ai pazienti immigrati, che rappresentano quasi il 10% della popolazione e sono portatori di culture differenti.
Dal 2011 il CCM organizza un Corso di Salute Globale per operatori sanitari con un modulo volto a migliorare le competenze culturali e le conoscenze sul fenomeno migratorio.
La "competenza culturale" è un percorso pensato per gli operatori sanitari che vogliano prendersi in carico la salute di tutti i pazienti.

Abstract

Cultural competence consists in attitudes, skills, behaviors and strategies allowing organizations and individuals to behave in situations of cultural diversity.
Health systems are requested to assist an increasingly varied population, composed also of migrants (in Italy, they represent approximately 10% of the overall population).
Since 2011, CCM has been organizing a Course in Global Health for health professionals. The course includes a module specifically meant to enhance participants' cultural skills, providing them with knowledge and competences helpful to deal with migrant patients.
All health workers committed to offer high quality assistance to each patient should attain "cultural competence".

Keywords
Migration, education and training, cultural competence

Introduction

Culture, though variously defined, can be deemed as a composite system of shared beliefs, values and behaviors, that individuals acquire both consciously and unconsciously throughout life. Cultures are multiples, layered and dynamic, and include language, styles of communication, practices, customs and views on roles and relationships. Each individual can be part of multiple and even contradictory cultures, which may attain to different spheres (e.g. profession, religious group, gender, age-groups). Culture goes beyond race, ethnic background and country of origin. Culture

shapes the way we approach our world and affects interactions between patients and clinicians (Betancourt, 2004).

Anthropologists use it as a heuristic (abstraction) useful to understand societies/communities, but warn against the risk of reification (e.g. African culture, Muslim culture, etc.).

Perceptions of physical and psychological wellbeing differ substantially across and within societies. Although cultures often merge and change, human diversity entails persistence of different lifestyles and beliefs, connected with different systems of values. Therefore, culture should be acknowledged as immanent to societies, shaped by and in turn shaping the political, economic, legal and moral context and practices.

On the one hand, if biomedicine ignores the pivotal role of culture, biological wellbeing may end up as the only measure for health. On the other hand, when 'culture' is reified and considered a main cause of good or ill-health, structural conditions affecting peoples' health status could be overlooked. Especially under conditions of constrained resources to health systems and biomedical ethnocentrism, patients – commonly the most vulnerable ones – could be themselves blamed for ill health.

In the three overlapping domains of **cultural competence**, health inequalities and communities of care, the deep connection between health and culturally-affected perceptions of wellbeing can be understood (Napier, 2014).

Cultural competence

Background

At the beginning of the XX century, with the advent of anthropological fieldwork in colonial settings, research attention started being paid to how different cultural concepts affect health-related behaviours (Frenk, 2010).

Medical anthropology is a branch of anthropology, studying people, health and healing within ecological, social, political and economic contexts.

Ways of thinking that at first seem foreign and exotic might seem less so once one understands how complex beliefs and practices overlap to produce coherent and consistent forms of meaning (Fadiman, 1997). In many societies—especially those in which malnutrition is ubiquitous—obesity is often mistaken for health (Popenoe, 2003), whereas in other cultures (Brazil, for instance) the right to be beautiful (as it is culturally defined) might extend to plastic surgery for poor people (Edmonds 2007; Napier, 2014).

Beliefs about the body that might baffle physicians— for example, the idea that diseases are the consequences of ancestral actions—might parallel new and emerging ideas in science about epigenetics, symbiosis, disease vectors, or evolutionary principles (Napier, 2012).

Clinical adherence

Although cultural competence training was initially developed in the 1960s, it has been formally integrated into biomedical education only recently, arguably in response to the need for health systems to address the rapidly changing demographic patterns and health priorities, following globalization and dramatic increase in the movement of persons, goods and services (Engel, 1997) (Betancourt, 2002). In most trainings, however, it is not present (as in Italian Medical Schools), even if the view prevails that cultural competence can improve clinical outcomes by addressing the needs of those who are different from whatever dominant socio-cultural groups provide care.

Even today, cultural competence and diversity are poorly valued within biomedical education, scarcely understood and subject to political rather than educational priorities (Dogra, 2007). Conventional understanding of cultural competence that emphasizes recognition of racial, ethnic and linguistic identities shifts clinical meaning away from socioeconomic determinants of health and standard clinical diagnoses. Cultural competence is surely much more than a vague umbrella term that encompasses training in cultural sensitivity, multi-culturalism, and cross-culturalism (Wear, 2003; Napier, 2014).

Competence as Mindfulness

Stella Ting-Tomey – in a broader reflection on "Identity Negotiation Theory" – summarizes the "Mindfulness Component" in competent intercultural communication as follows:

> "Langer's (1989, 1997) concept of mindfulness encourages individuals to tune in conscientiously to their habituated mental scripts and preconceived expectations. Mindfulness means the readiness to shift one's frame of reference, the motivation to use new categories to understand cultural or ethnic differences, and the preparedness to experiment with creative avenues of decision-making and problem solving. Mindlessness, on the other hand, is the heavy reliance on familiar frames of reference, old routinized designs or categories, and customary ways of doing things. It means we are operating on "automatic pilot", without conscious thinking or reflection. It means we are at the "reactive" stage rather than the intentional "proactive" stage. To engage in a state of mindfulness in transformative intercultural communication, individuals need to be aware that both differences and similarities exist between the membership groups and the communicators as unique human individuals" (Ting-Tomey, 2005).

In discussing Anxiety, Uncertainty, Mindfulness and Effective Communication, William Gudykunst states:

> "To communicate effectively with strangers, we must be able to understand strangers' perspectives. This requires mindfulness. As indicated earlier, Langer (1998) argues that

> mindfulness involves creating new categories, being open to new information, and recognizing strangers' perspectives. Communicating effectively with strangers requires that we develop mindful ways of learning about strangers….These processes are all interrelated and lead us to be 'receptive to changes in an ongoing situation" (Praxmarer, 2010).

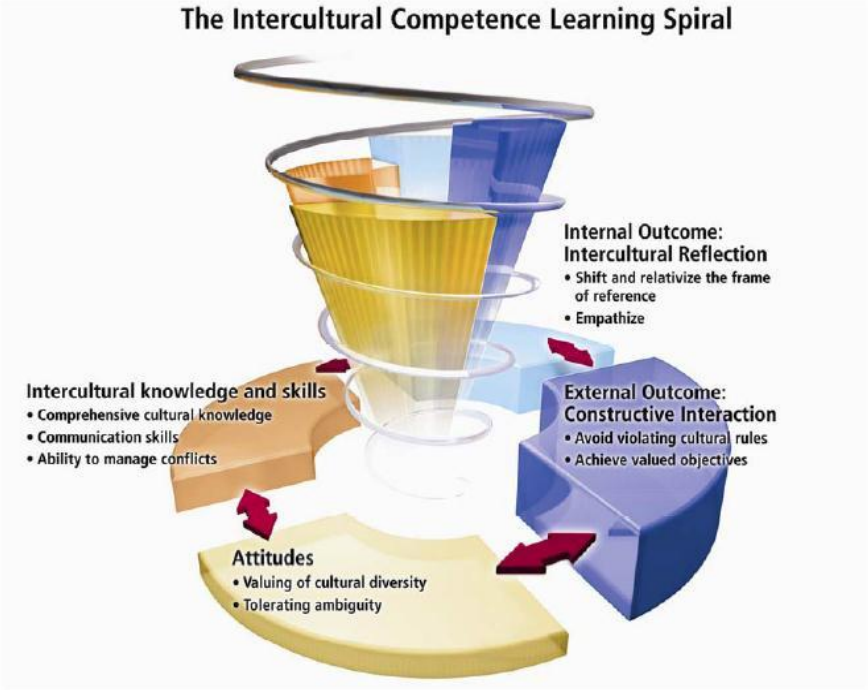
Profiling The Intercultural Effective Person (Fig.1)

The profile of skills and knowledge identifies nine major competence areas for a person, to be acknowledged as being intercultural competent:

- adaptation skills
- an attitude of modesty and respect
- an understanding of the concept of culture
- knowledge of the host country and culture
- relationship-building
- self-knowledge
- intercultural communication
- organizational skills
- personal and professional commitment"

(Praxmarer, 2010), (Kealey, 2004), (Slavik, 2004), (Vulpe, 2000)

Fig.1 - Development of Competence as Learning Process



Source: *Intercultural competence – The key competence for the 21st century?* Theses by the Bertelsmann Stiftung (2006) based on the models of intercultural competence by Dr. Darla K. Deardoff: http://www.bertelsmann- stiftung.de/bst/de/media/xcms_bst_dms_18255_18256_2.pdf)

Cultural competence consists in a set of attitudes, skills, behaviors and strategies enabling organizations and workers to effectively deal with situations of cultural diversity.

As mentioned above, over the years it evolved from theories on how to behave with patients of different cultural backgrounds to principles of patient-centered care, granting all individuals empathy, understanding and satisfaction of their needs, values and preferences.

In each doctor-patient relationship both communication skills and the cultural background of patient and doctor play a key role in the outcome of care (e.g. patient's compliance, appropriate use of the health services, health-seeking behavior).

Globalization and the related expansion in the movement of people, goods and services have deeply affected national health systems and health professionals' practice. On the one hand, patterns of transmission and distribution of infectious and chronic diseases have deeply transformed, while on the other hand biological, social, economic and cultural features in each person are more and more diverse. Therefore, health systems struggle to provide adequate assistance to migrants, failing to adjust to rapidly changing patients' needs and features.

Migrant status and ethnicity interact with many other factors (e.g. age, gender, socio-economic status) and shape unique human beings, with unique needs and resources. Health care organizations and professionals need to take into account this complexity. Therefore, attention to diversity should be a main pillar of health care planning, including health care staffs' education/training and recruitment and organization of health care provision (Seeleman, 2015; The Migrant Friendly Hospital project: the Amsterdam Declaration, 2015).

In this frame, valuing cultural competence in biomedical profession is pivotal. Medical schools should be the primary agents of change by taking the necessary steps in their institutional setup, curriculum development and delivery of medical education (Sorensen, 2017).

Ccm activity

Comitato Collaborazione Medica (Ccm) considers the right to health for all a guiding principle and main target. Since 2008, Ccm has been partnering Piedmont local and regional health authorities to enhance the access and use of health care services by most vulnerable groups, including migrants. To this aim, Ccm has developed a series of training modules on cultural competences targeting health professionals, medical and nursing students, cultural mediators, educators and social workers. Moreover, since 2012, together with some non-governmental organization (Ngo) of Consorzio Ong Piemontesi (Cop) and the University Piemonte Orientale, Ccm has been rolling out a Course in Global Health for health professionals. The course includes a specific module meant to

improve participants' cultural skills and knowledge about migrants' health related vulnerabilities and relational and communicational skills helpful in dealing with migrant patients .The total number of students from 2012 to 2017 was 66 of which 34 medical Doctors (MD) (Fig.2). The teachers were MD, Anthropologists, Experts in social sciences and cultural mediators (Fig.3).

Fig.2: Participants to Global Health Courses

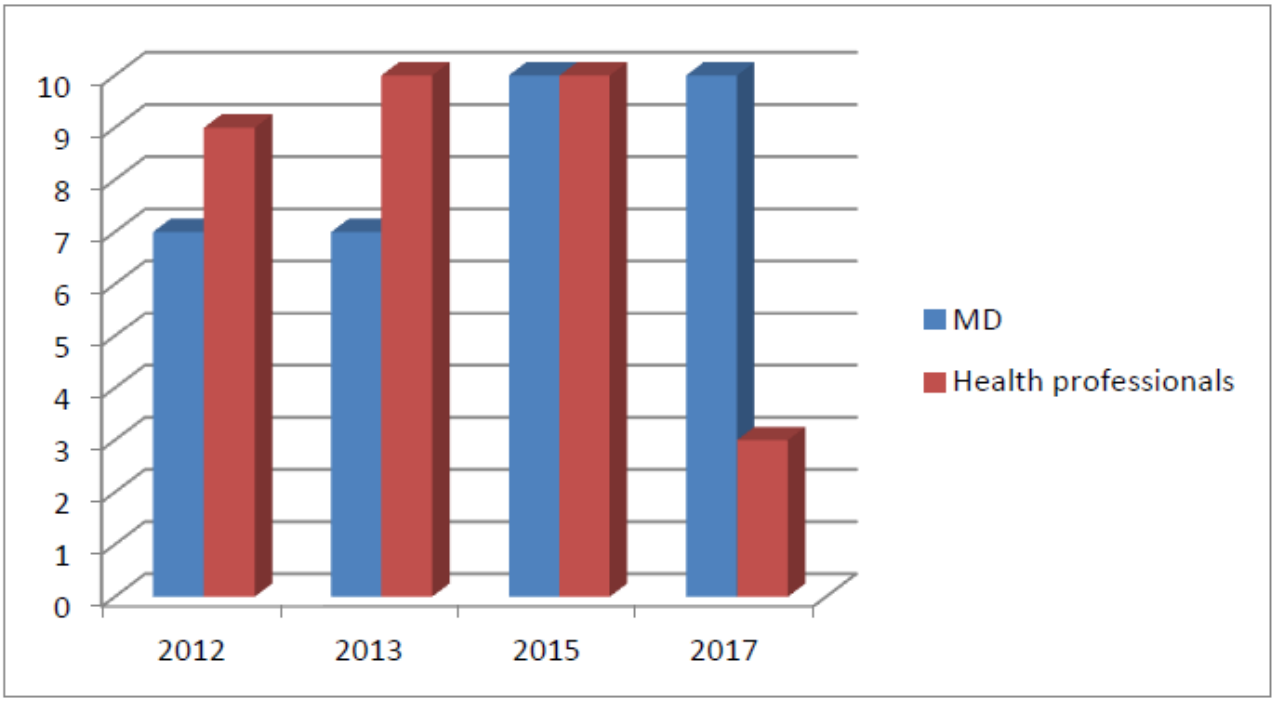
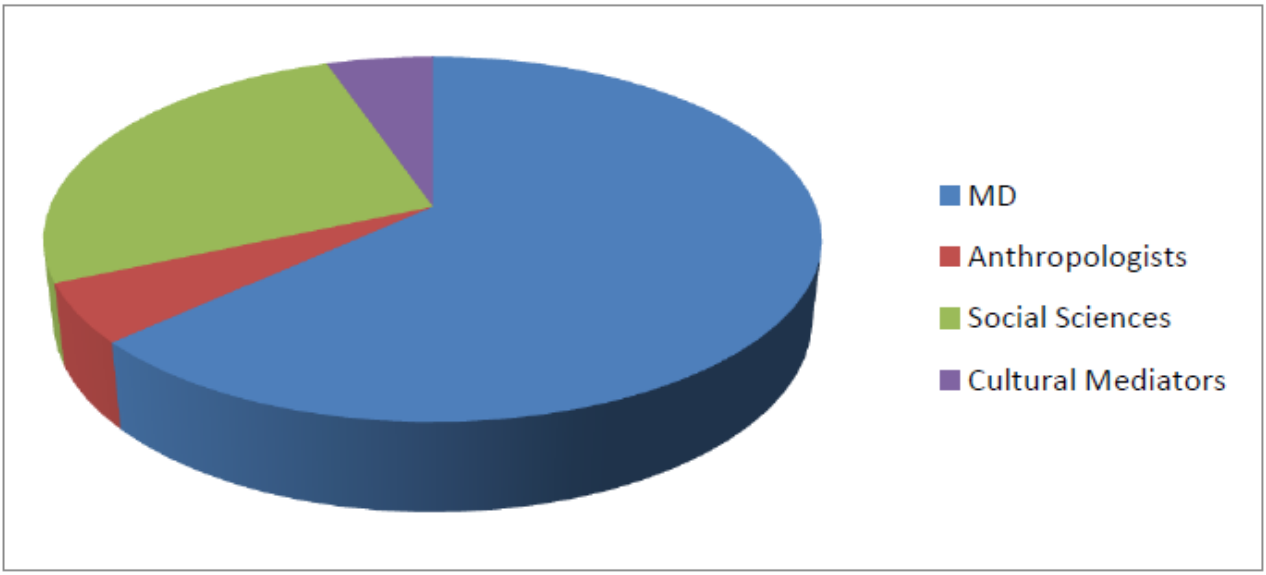


Fig.3 Teachers profession



According to the objectives of Dublin Descriptors (December 2004) and the indications of the Association of American Medical Colleges (Aamc), medical students should attain the following:

- Knowledge and understanding about how people from different cultures and beliefs perceive health and illness and how they react to symptoms, diseases and therapies;
- Applied knowledge and capacities to recognize and adequately face gender and cultural prejudices, putting patient's health at the centre;
- Autonomy of judgment, in order to give the right importance to the relationship between effective communication and quality of care;
- Communication skills, demonstrating the ability to ask questions unveiling patient's preferences and to answer patient's needs from a cross-cultural perspective;
- Learning skills, being able to acknowledging socio-cultural factors and the impact of ethnic, cultural and socio-economic factors on decision-making and clinical processes.

CCM courses cover the following subjects:

- migration in Italy (social and legal aspects), health inequalities and social determinants of health;
- principles and objectives of health promotion and Information, Education and Communication (IEC);
- linguistic and communication challenges in contest of intercultural service provision;
- health policies in globalized contexts and 'health in all policies' approach;
- cultural competences in health organizations, structure of the Migrant Sensitive Health Systems;
- Health inequalities between and within countries: focus on mother-and-child health, infectious and chronic diseases, traumas, primary health care.

As a good communication between doctor and patient is likely to result into positive therapeutic outcomes, integrating "cultural competence" into health staffs' educational and professional background aims to significantly contribute to individual, public and global health. In this frame, CCM training programmes and related initiatives mean to provide an answer to the urging educational needs of health professionals.

Cultural competence is not a panacea that will single-handedly improve health outcomes and eliminate disparities, but a necessary set of skills for physicians who wish to deliver high-quality care to all patients. If we accept this premise, we will see cultural competence as a movement that is not marginal, but mainstream (Betancourt, 2004).

Acronyms

Ccm	Comitato Collaborazione Medica
Ngo	Non Governmental Organization
Cop	Consorzio Ong Piemontesi
Aamc	Association of American Medical Colleges
Iec	Information, Education and Communication

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A POSSIBLE ALTERNATIVE TO ILLEGAL MIGRATION IN SOUTH WOLLO (ETHIOPIA)

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Abstract

Il paper condivide, partendo da un'analisi del fenomeno migratorio in Etiopia, le lezioni apprese da un progetto di sviluppo sulla migrazione realizzato in Etiopia tra il 2016 e il 2017 dall'ONG Cifa e cofinanziato dall'AICS. Il progetto, basato su una partnership con l'Università di Torino e il Master in Teatro Sociale e di Comunità, e attori locali quali l'Università di Wollo, autorità ed ONG locali, ha affrontato il problema migratorio, con tutte le sue tragiche conseguenze ed alto livello di sofferenza, attraverso un approccio multisettoriale.

Abstract

The paper, starting from an analysis of migrations in Ethiopia, shares the lessons learned from a development project implemented on migration in central Ethiopia. The project "A possible alternative to illegal migration", implemented in 2016/2017 by the Italian NGO CIFA and co-financed by the Italian Development Cooperation Agency, was based on the partnership the University of Turin and the Master of Social and Community Theater and local actors like the Wollo University, local authorities and NGOs, which allowed tackling the phenomenon of illegal migration, with all its tragic consequences and high level of suffering, through a multi-sector approach.

Keywords

Migration, Ethiopia, Job creation, Innovative teaching methodologies, Social and Community Theater

Migration in Ethiopia

The Horn of Africa and more specifically Ethiopia are historically characterized by human migrations. Conflicts, drought, famine are the main causes[1], however, in the last years, economic reasons are prevailing on others[2]. Ethiopia is simultaneously a country of origin, destination and transit for migrants. Migrations of Ethiopians towards other countries represent a complex phenomenon and concern regular and irregular migrants as well as human traffic victims.

[1] Fransen and Kuschminder, 2009
[2] Rmms (Regional Mixed Migration Secretariat), 2014

The three main identified migration routes from Ethiopia are: 1) the "Eastern route" towards Saudi Arabia and other Middle East countries via Djibouti and Yemen; 2) the "Northern route" towards

Fig. 1 - Mediterranean Migration routes and other routes, Thomas Reuters and IOM,2016

Europe via Libya; 3) the "Southern route" towards South-East Africa and South Africa via Kenya.[3] The main destination is Saudi Arabia, but Ethiopians lead also towards Europe and South Africa. In 2012, 200,000 Ethiopians migrated legally to the Middle East for work reasons. This figure represents only 30-40% of the total in the same year. The remaining migrants (between 300,000 and 350,000 people) were human traffic victims or have been illegally brought in by traffickers.[4] Migration of Ethiopians for work reasons prevail among the irregular migration flows towards Yemen representing 78% of all migrants coming from the Horn of Africa. Reports on trafficking by the U.S. Department of State count Ethiopia among the countries of origin of hard labor and sexual traffic victims (Rmms, 2013).

The freedom of movement within and outside the country are in principle constitutional rights of Ethiopians. Still, traveling abroad other than the ways stated by the law is illegal and punishable. Any employment agency or person without a license, or with a suspended or expired license found in sending Ethiopians abroad is punishable with imprisonment and fine. Trafficking in human beings for whatever purpose is prohibited and deemed to be illegal. Though, despite the existence of a legal framework, illegal migration is by far the most prevalent way to leave the country for working purposes in Ethiopia. People migrate to the Middle East countries through illegal means rather than through legalized ones, which also indicates low levels of law enforcement. US department report on human trafficking made clear that 60-70% Ethiopian migrants to Middle east made their journey through illegal means with the facilitation/services of traffickers.[5] There were more than 400 legally registered private employment agencies and the great majority was reported to be involved in both legal and illegal recruitment of Ethiopians with the purpose of out-migration. Another report entitled "Letter to Saudi" also mirrored the involvement of all except 20 private employment agencies in illegally sending of Ethiopians to abroad.[6]

As a result of the prevalence and alarmingly increasing of illegal migration, the Ethiopian Government felt the need of having a law exclusively focused on illegal human trafficking and to strengthen its law enforcement capacity. Accordingly, a new law on human trafficking was enacted in August, 2015. The law was called "A proclamation to provide for the prevention and suppression of trafficking in person and smuggling of migrates".[7] The law gave a clear definition of what human trafficking is, broadened the concept of trafficking, and tightened the penalty of people prosecuted and convicted. The creation of a binding bilateral agreement with the migrant receiving countries

[3] Martín and Bonfanti, 2015
[4] RMMS, 2013
[5] Usa State Department, 2015
[6] Rmms, 2014
[7] Fdre, 2015

was another important action that the Government of Ethiopia made to address the problem of illegal migration and ensure the rights and benefits of its people migrating to abroad.

The repatriation of more than 170,000 Ethiopians labor migrants from Saudi Arabia between the end of 2013 and beginning of 2014, the eruption of xenophobia movement in South Africa in 2014 and the killing of 30 Ethiopians in Libya in 2015, were amongst the big events that have exacerbated the public opinion and lead the government to adopt an "*unusual response*" to address the problem of illegal migration in the country. After these violent events, the Government of Ethiopia took various measures: the banning of labor migration to the Middle East, the suspension of permit of operation for the Private Employment Agencies, the enactment of law on human trafficking, the effort of raising awareness through different programs were amongst the responses given to the problem.

Despite all these efforts, the problem of illegal migration increased. Especially the ban on overseas migrant labor fueled in the last years the illegal migration because labor migration through legal mechanisms was no longer a viable option. It has been proven that Ethiopians are once again arriving in significant and increasing numbers along Yemen route despite the ban is still in place.[8]

Being aware that both Ethiopia represents a labour reserve for rich Arab Countries[9] and that the illegal migration was increasing, the Ethiopian Government enacted in 2016 the law "Ethiopia's Overseas Employment Proclamation 923/2016", which designed a new framework of overseas employment. In this regard, the Government also finalized bilateral labor migration agreements especially with those countries where Ethiopian migrants flows are mainly addressed, such as Kuwait, Qatar, Jordan and, very recently (signed on 25th May 2017 in Jeddah), with Saudi Arabia.

Migration patterns in South Wollo, Amara Regional State, Ethiopia

South Wollo, in the Amhara Regional State, is among the areas which are mostly touched by the irregular migration phenomenon. The urbanization level is lower than the national one, which is 16%.[10] The majority of people are Muslims (70.8%), followed by Orthodox Christians (28.70%). The literacy rate is 45.5% (51.8% for men and 39.3% for women). The official unemployment rate is 15.8%. Agriculture is the main economic sector. Data collected during the needs assessment phase on the ground by Cifa and its partner Ifso indicated that almost all the families of the area are involved in some way in the phenomenon of irregular migration. Testimonies agreed that migration

[8] Rmms, 2013
[9] Bisrat et al., 2017
[10] World Bank, 2016

for work reasons was growing because it represents a strategy for family livelihood and survival. The dream to change one's own life and that of their families, together with the lack of real work opportunities, lead young people to choose migration. People involved are among 18 and 30 years old. Migration concerns both men and women. Several data prove that women migrate more than men, but thanks to the ease in finding a job in The Gulf countries, till the ban to migrate for work reasons, they preferred the legal air transport, while men were used to illegal migration.

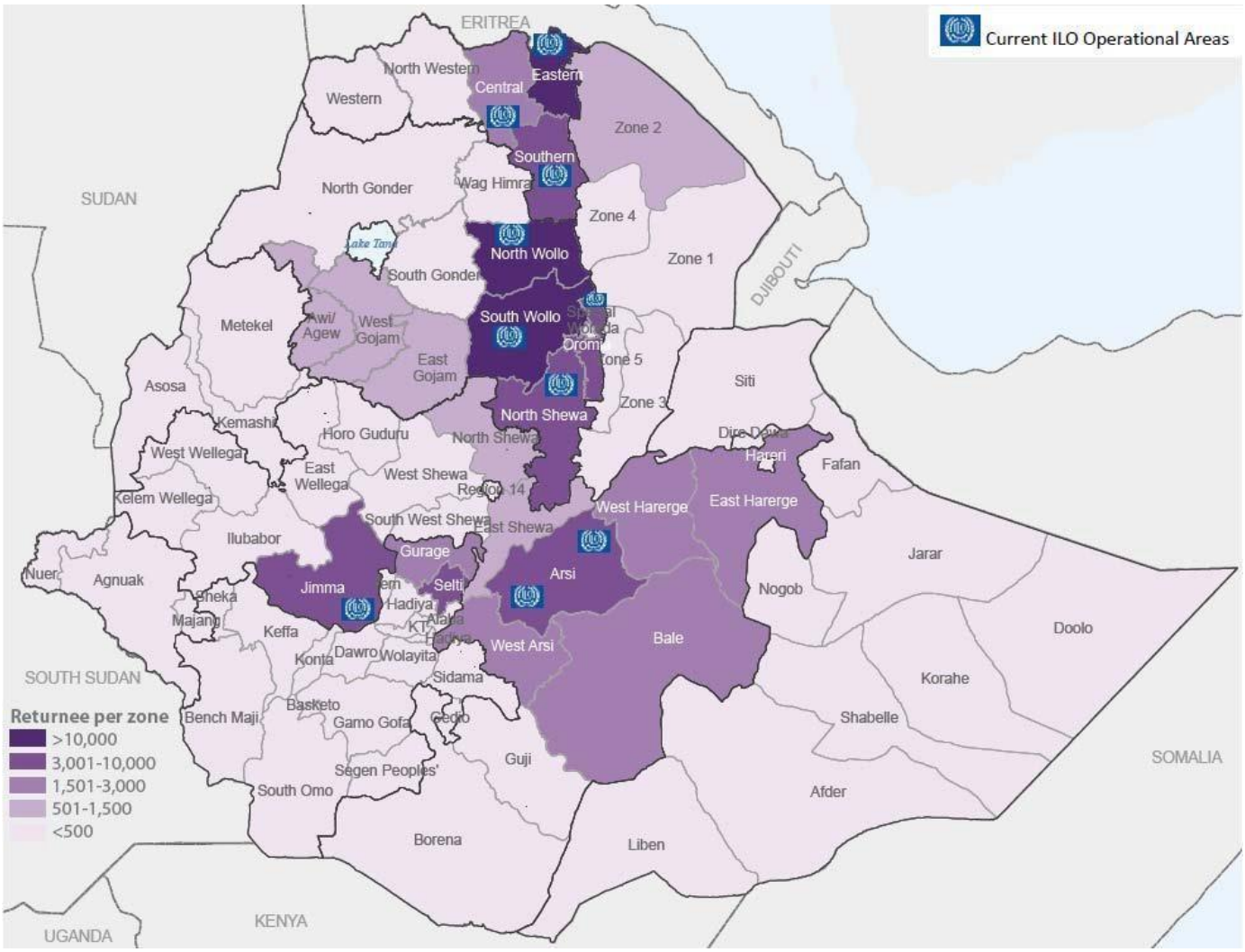

Fig. 2 - Unocha Map of returnee locations and Ilo operational areas in the action 'Support to the reintegration of returnees in Ethiopia', 2015.

The phenomenon of irregular migration in the Zone of South Wollo, Amhara Region, was investigated by the research "*Magnitude, Determinants and Effects of Illegal Out-Migration from South Wollo Zone, with a particular Emphasis on selected Woredas*" conducted by the Wollo University in the framework of the Cifa's project "A possible alternative to illegal migration". The

research focused on the three target woredas (administrative districts), namely Ambasel, Tehuledere and Worebabo, where projects activities were implemented. Applying a mixed approach of qualitative and quantitative methods, 160 people (returnees, members of migrants' families, and community leaders including public officials, religious leaders and elders) were directly involved in the research through questionnaires, interviews and focus group discussions. Data were thus collected, analyzed and described by the researchers of the Wollo University.

According to the opinion of respondents out-migration, especially of low-skilled illegal migrants, is a growing phenomenon in South Wollo. An estimation of the out-migration trends can be provided by the number of people from the target who requested a passport: the data provided by the North East Immigration Office in Dessie refer of a three-fold increase in 2016 compared to 2014 figures. The same office reports a number of licensed travelers (mainly holding a tourist visa) which increased from 1329 in 2014/2015 to 4072 in 2015/2016.

Poverty is among the root causes of illegal migration in the area. Impoverishment is linked to various factors such as population growth, food shortages, indebtedness in rural areas and inability to repay the debt, and lack of job opportunities for graduated students. 96% of interviewed returnees stated that an "impoverished life" was the key factor for their illegal migration. This is linked to the particular morphology and topography of the land characterized by gorges and slopes, which leads to problems of accessibility to the land. Interviewees stated that plots of land available to families are not sufficient to guarantee sustainable productivity. Most of plots are used in fact for auto-production while "production for export is insignificant".[11] Further challenges to farmers' self-sufficiency stem by the increase of local population, drought and decline of productivity of arable farmland, factors that exacerbate the vulnerability of local rural population. Beside the push factors listed above, the research mentions re-enforcing factors such as low expectations towards local job market (generally there is a negative expectation towards jobs that can be found locally compared to the jobs offered in Arab countries, this despite the many risks of the journey) and pull factors such as the examples given by successful returnees or contacts held with traffickers.

Information regarding routes is available from the *South Wollo Labour and Employee Affairs 2015 human trafficking plan*, confirming the routes reported by international and national researches (the North route via Metema, the Eastern route via Bati- Afar and Somalia, and the Southern route via Kenya). Many respondents agree with information provided by other written and oral sources who describe the journey towards Saudi Arabia – by far the main destination for illegal out-migration from South Wollo. Three routes are mentioned: 1) Dessie – Kombolcha – Besheftu – Hayo – Djibuti

[11] Kassagne and Gashaw, 2017

– Jeza (Yemen) Saudi border, 2) Addis Ababa – Harar – Jijiga – Besseso (Somalia) – Yemen – Saudi border, and 3) Addis Ababa – Adama – Deshitu – Hayu (Djibuti) – Yemen – Saudi border. Once they have reached the coast they are kept in a "fenced but unofficial and hidden concentration camp" (Kassegne and Gashaw, 2017, also in IADC, 2017) held by Yemeni brokers. Overall migrants meet four groups of brokers: (i) on the border between Ethiopia and Djibuti, (ii) between Djibuti and the coast, (iii) the Yemeni brokers who facilitate the crossing of the sea, and (iv) the Saudi brokers who organize the journey from the border to Jeddah and other destinations in the country. At each stop along the journey traffickers demand the payment of a new installment of the travel expenses, amount that was not included in the first payment done at the origin place. Each time the migrant is held, beaten and forced to give contact details of relatives in the destination country from whom to extort new amounts of money. Travel cost can be as high as 2,300 euro according to respondents, which is an enormous amount for local families.

Interesting is the analysis of risks related to the journey, which describes its several dimensions. Risks related to the journeys refer to several dimensions. The first is associated with the families of the migrants when the emigrants decide to go: beyond the pain caused by the separation that represents high emotional costs for both the mover and those left behind, in other occasions migrants need to face the refusal of their families which results in disruption of marriage, selling and distribution of properties between spouses, and serious conflicts among family members. Other risks refers to the route itself, with plundering of properties during the journey (46% of respondents who mentioned money raid, looting of glamorous ornaments, taking of watches, ravaging of cloths and other essential materials) and physical violence (36% of respondents) among main factors mentioned by respondents. Brokers torture migrants even to death (burns of parts of the body or damage of eyes as well as being beaten with sticks, electric wire, plastic rope, straps and thrust) until they give the phone number of relatives or other contact persons in Saudi Arabia, whom they ask additional money for continuing the journey. Other suffering comes from hunger and water thirst, bite by poisonous stakes, boat crush and sinking in the sea, lose of physical fitness, while rape is regular against women. The third area of risk is after the arrival of the emigrants in the destination country: here migrants denounce absence of right to change employer, being subject to physical violence, unbearable workload, long working hours per day, lack of freedom and denial of salary payment as common experiences of working as illegal workers in foreign countries like Saudi Arabia. Finally, the fourth area of risk is when emigrants are captured and then deported to their home country: due to the attempt to live and work without having a residential permit, the lack of political stability and other related factors in the host country most of the illegal migrants are exposed to arrest and deportation. Most of the interviewed illegal out migrants (returnees) stated that

returning home from the host countries was caused by deportation, end of contract, boredom from the general hard working and living conditions, health problems, home sickness and to grab the money they earn, were deportation (66%) and end of contract (19%) were the most frequent cases.".[12]

Regarding the analysis of the consequences and effects of migration on the lives of migrants' families and communities, from the South Wollo research a negative impact seem to prevail on the possibility of a positive outcome (with a certain discrepancy from the other six researches conducted in the framework of the IADC programme, according to which migration improves the family's standard of life[13]). Majority of respondents in South Wollo claimed that bankrupt was common among emigrants' families, due to heavy interests on money loans (around 100% of original borrowed sum), as well as sale or loss of properties. Other consequences reported are: change of beliefs or radicalization of Islamic beliefs (including use of Arabic as lingua franca), school dropout with the aim to leave the country, disruption of families due to divorce, neglect of children abandoned by one of their parents. "*Migration caused divorce according to about 60% of returnees, 75% of migrants' family members and 83% of community leaders*".[14] This, together with the drain of workforce, leads to the conclusion that migration generally takes a heavy toll on the socio-economical fabric of the origin communities. On the other hand remittances, when available, are most often used for consumption purposes (purchase of houses, domestic animals, house furniture or vehicles) rather than invested with a planned and aware strategy (buying a shop or a bar or investing in children's education were among the few examples mentioned).

The Project

In the framework of the Italian policies on migration and its priorities for the development cooperation, in 2015 the Italian Agency for Development Cooperation (Iadc) implemented in Ethiopia in 2016 a pilot programme "Emergency Initiative targeting vulnerable people such as IDPs, migrants and refugees". The programme funded five projects implemented by several Italian NGOs with the aim to address the root causes of migration with a strategy encompassing four sectors: support income generating activities and access to job opportunities, with special focus on young people and women; support to local communities' resilience and living conditions also by improving the quantitative and the qualitative supply of basic services; information and awareness

[12] Kassegne and Gashaw, 2017, also in IADC, 2017
[13] Iadc, 2017
[14] Kassegne and Gashaw, 2017, also in Iadc, 2017

campaigns as well as realization of uptodate and field researches on migration.

With the aim to participating in such programme, Cifa conducted a needs assessment[15], which, together with other existing relevant data obtained from government and Ngo sources, led to the identification of the real problems, needs and priorities of the intended target groups, especially potential migrants and returnees, including youth, women and men (impoverishment and lack of job opportunities, lack of awareness about the risks of irregular migration). The project was also in line with and it tried to contribute to the relevant policy frameworks including the Federal Constitution, the National Youth Policy, the National Women's Policy, the Cooperative law and the Cooperative development Strategy, the second Growth and Transformation Plan (Gtp II), and the like that promoted women and youth empowerment, employment and job creation, development of cooperatives as well as the participation of women and youth in social and economic spheres. Besides, the project activities were designed with a multi-sector approach as they involved various interventions that supplemented each other and thus attempted to address the multi-dimensional problems of the target groups that lead to illegal migration.

Cifa Onlus has been undertaking the 10-month pilot project entitled *"A possible alternative to illegal migration – Project for economic empowerment of potential migrants and awareness creation among the communities in South Wollo, Ethiopia"* from May 2016 to March 2017 in three districts/woredas, namely, Tehuledere, Worebabo and Ambassel woredas of South Wollo zone in Amhara region. The total project's cost implemented by CIFA was 284,362 Euro. The strategy on the one side aimed to create immediate job opportunities for potential migrants and to reinforce the local network for credit accessibility through the improvement of local system of savings and credit cooperatives (Sacco); on the other side a strong focus was given to contrasting the spread opinion that illegal migration represents a valid alternative to the lack of opportunities in the area of intervention. The project was therefore structured in four main components, i.e. (i) increasing employment/self- employment opportunities allowing potential migrants to be competitive in the labor market (with special attention to women and returnees) through access to specific trainings in the three target Woredas; (ii) strengthening the local network for credit accessibility through the improvement of Saccos in the project Woredas; (iii) raising the awareness on illegal migration risks and on the social impacts working with teachers and students of the second cycle of primary school and the first cycle of secondary school and community members in the targeted Woredas; and (iv) conducting the above mentioned research by Wollo University on illegal out-migration from South Wollo Zone.

[15] Cifa, 2015

Projects on migration usually have a strong component related to job creation. Being poverty and lack of job opportunities among the root causes for leaving one's country, at least in Ethiopia, this is a pivotal component to be implemented. Vocational trainings activities were selected based on data received by a government training institute, the Development Logo Hayk Technical and Vocational Training College in Hayk (Tehuledere Woreda), located in one of the target areas. Based on available data (experience of employment rate after the trainings), 7 different kind of trainings were selected considering their high/very high appeal to the labor market. Trainings, held at the professional training centre, included both theory and practical sessions, provided a grant to start up a business activity at the end of the training (after development of a business plan) and provided an officially recognized certification issued by a public authority. With the aim to supporting the integration of the beneficiaries into the labour market, at the end of the vocational skills trainings, the school's coordination staff and project's socio-economical operators facilitated the matching of business start-ups with local market, helped with administrative requirements, and provided tutorship and follow up.

As an important component of the project, institutional building activities involved public officers and local saving and credit cooperatives. ToT training for public officials was implemented with the aim of strengthening the capacity of local institutions to facilitate local economic development. 18 public officers coming from the Departments of Women and Children Affairs, Cooperatives Promotion, Micro and Small Enterprise Development of each target Woredas were trained in areas such as Basic Business Skills, Life Skills and Cooperative Leadership. Trained officers at the end of the training, supported by expert trainers, delivered the training to the members of local savings and credit cooperatives. SACCOs are an institution first established in Ethiopia in the mid-1960s, whose number increased from 5,437 in 2006 to 14,453 in May 2014.[16] In project's target areas, each Kebele (administrative unit below Woreda level) has one Sacco. 15 Saccos participated in the project. In order to access a Sacco, an applicant must provide a small capital but once they join they can also borrow a loan. The training for over 500 Sacco members, provided as mentioned by trained public officials, included topics such as conflict resolutions management, meetings management, and other more technical ones: book-keeping, financial services, budget drafting, auditing. Follow up and coaching was also provided to trainees along the project.

The need to strengthen the membership of Saccos was also among the desired results of the project, while, at the same time the needs assessment findings showed how girls and women represented the most vulnerable groups of potential migrants and the gender component was another identified

[16] Tesfamariam, 2015

priority. So the project included a component of training for 300 poor working women (poor but active on the local labor market) who then became members of the Saccos. Training included topics such as entrepreneurship, development of competitive business ideas in the local market, planning (through business plan) and management of economic activities, financial language, self-esteem strengthening, efficient communication and the importance of information. Trainings' beneficiaries were encouraged to use part of their per diem to access the saving and credit cooperatives as a starting capital. Women represented over 60% of project's target beneficiaries.

Finally the project included a strong component of awareness raising, working with school children, teachers and community members through the methodology of social and community theater with the aim to strengthening the awareness about the risks of irregular migration, which were described above. Social and Community Theater (Sct) is a technique in which community members themselves are involved in theatrical and musical events to disseminate certain messages and sensitize communities on specific subjects Returnees' descriptions about their journey were incorporated in the creation of the game "The path of life" which reproduced the entire experience step by step on a format similar to a *game of the goose*: the choice, the planning of the travel, the travel, the arrival in the new country, the new life, the return. The game board was created through ad hoc pictures produced by an artist and then taught to school teachers who played the game in their classes reaching out a total of over 3000 pupils. Furthermore community events were organized. To do so, one social worker and three facilitators (one for each woreda) have been trained by experts from Turin University, on Sct techniques and creation and implementation of the Game. In addition, 119 community representatives in the three target woredas were trained by Italian experts on Sct. The groups trained to Sct techniques organized in collaboration with local authorities final public events, last step of Sct intervention in each woreda, with a total audience of over 1000 people. This performance was created involving storytelling about the experience of a journey of an illegal migrant and art installations such as videos and pictures, using inter-active actions with the public.

Lessons learned

One first broad consideration refers to the relation between development projects and migrations. An analysis of the mandate of development Ngo projects will identify the fight to poverty as one of their core goals. "Development cooperation has the primary principle to fight poverty and not to manage migration flows".[17] Also, taking into consideration the Eu treaties, Eu commitment towards

[17] Stocchiero, in Iadc, 2017

development cooperation passes by poverty reduction and not by migration management (Funk, Mc Namara, Pardo, Rose, 2017). Ngo projects are chiefly accountable with the purpose of poverty reduction and their action should not be seen as a practice in contrast with the current migration policies, that are now focusing on the management of the flows, or with development trends, that show that development aid to lower-income countries generally leads to increase migration flows instead of decreasing it (the so called migration hump). Current reality is that migration control has become a priority of the Eu, where the management of the flows have taken over development arguments. This notwithstanding, in the long term development and poverty reduction should still remain the ultimate goal of Ngos' work and interventions, while current measures to contrast illegal migration should be seen as a mean to be used in the short term.

Programmes should take into consideration the economical dimension of the migration phenomenon and of the migration business. Countries of origin and of transit find themselves between the incentives of programmes based on the principle of conditionality, used by Eu as a mean to ensure cooperation on migration management, and the important revenues of migrants' remittances (as high as 22.4% of Gambia's Gdp, but 1% of Ethiopia's[18]). At the same time the business of migrants' smuggling represents a meaningful source of income for entire communities along the routes who have become dependent on them. Corruption is another side effect of the phenomenon, where local authorities at grassroots level also benefit, as much as smugglers and money dealers, from the migration business. All these factors make it difficult for the Eu to establish an efficient cooperation with countries of transit and origin.

The cultural dimension of migrations is equally relevant since the phenomenon, as in the case of South Wollo, has become so widespread and common that almost every household is touched in a way or another by the departure of at least a relative or a friend. The lack of awareness about the risks of migration has shown not to be the core problem: prospective migrants are rather aware of the dangers of the journey, of possible violence, abuses and even death that they can meet on the way. However a mis-perception of the positive aspects of life in destination countries and a rather irrational overemphasis of success stories distort a sound evaluation of migration given by prospective migrants and their families, who often see migration as the only way to improve their livelihood. It is necessary therefore to build a new perception of migration contributing to change the current culture of migration. However awareness raising actions should go beyond the testimonies of the returnees about their challenging experiences and consider to include also other approaches such as work with school teachers and students as well as communities.

[18] World Bank, 2016

Keeping in mind the multi-dimensional roots of migrations, it is crucial to maintain a multi-sector approach, which is encouraged by the Iadc and applied in many development programmes. Support to job creation and to income generating activities alone cannot contribute to the improvement of the socio-economic tissue and therefore ease the drive to migrate. Provision of social services, health services, education programmes and policies, are all tools that have an impact on households' livelihood and also have an impact on families' income. Considering that migration is a phenomenon that cannot be stopped in the short term, its management must necessarily include regular migration channels: local development policies, programmes and actions should go hand in hand with controlled but feasible migration measures implemented by destination countries. It is noteworthy - but it would also require some reasoning - that all legal migration channels disappeared recently from any EU migration policy.

Main constraints to an integrated approach and to effective results are also linked to the lack of coordination of different actors, where Eu is fragmented and strongly conditioned by the political impact of the migration "crisis", while fragile states like Ethiopia struggle to develop adequate internal measures and development policies or to implement those already existing. In the case of Ethiopia, and South Wollo in particular, legal and political framework to tackle migration issues is available but there is lack of serious political will to implement effective control over illegal migration or develop measures and policies to foster development and mitigate causes of migration. The Illegal Migration Task Force established by the government as a inter-department unit that should act at various levels of the administrative structure is not implemented. An adequate attention to law enforcement should therefore be given in project design and adequate actions implemented both at central and local level. Very important is therefore to ensure that programmes on migration include components aiming at promoting good governance with the aim of strengthening both government institutions and civil society.

It is worth here also to mention briefly some of the recommendations drawn by the Iadc research programme[19] Migration should be managed through local policies that should: develop comprehensive migration and youth policies built with the aim to create decent work opportunities; encourage migrants' households to invest their earnings in a balanced way and diversify strategies to prevent the risks linked to low levels of sustainability; include negotiations for better integration of migrants in destination countries and for the protection of their rights; support the trend of Ethiopia as a labour exporting country with ad hoc labour and education policies that enhance vocational trainings; strengthen social services at local level, including reintegration of returnees and

[19] Iadc, 2017

protection of left behinds, particularly children; include measures aiming at enhancing the positive impact of financial remittances of migrants on the local rural and urban communities, mainly by the financial inclusion of migrants and their families and better management of financial institutions.

Considering the demographic trend of sub-Sahara Africa, with a population that in 2050 is expected to double (passing from current 1.2 billion to 2.4 billion), the migration problem might go out of control and short term management measures might not be sufficient. Root causes of migration are very complex and profound, which stem from economic backwardness, are emphasized by fragile states' weaknesses and are hindered by the beneficiaries of the new huge business as well as by the lack of cooperation among actors. Only multi-sector programmes that respond to very long-term strategies can therefore lead to significant results.

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LABOR MARKET AND MIGRATORY FLOWS IN ITALY DURING THE CURRENT ECONOMIC CRISIS

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Sommario

La crisi economica ha rallentato fortemente sia l'aumento della popolazione straniera, sia l'aumento dei lavoratori stranieri. Tuttavia, in cifra assoluta, entrambi i gruppi sono cresciuti. Il motivo di lavoro come causa di entrata è fortemente caduto sino al 2015, mentre è aumentato il ricongiungimento familiare. Sino al 2013 è fortemente caduto il tasso di occupazione ed è aumentato il tasso di disoccupazione, tuttavia dal 2014 la situazione è leggermente migliorata per entrambi i tassi. La crisi ha peggiorato le condizioni di lavoro: è aumentato il lavoro nero, il demansionamento e la segregazione occupazionale nei settori meno strategici.

Abstract

The economic crisis has greatly slowed both the increase in the foreign population and the increase in foreign workers. However, in absolute numbers, both groups have grown. The reason for work as a cause of entry has strongly fallen until 2015, while the reunification of the family has increased. Until 2013 the employment rate fell strongly and the unemployment rate increased, however, since 2014 the situation has slightly improved for both rates. The crisis has worsened working conditions: black labor, demotion and occupational segregation in the less strategic sectors have increased.

The increase in foreign working population.

Some lights and many shadows characterize the labor market of immigrants in these years of crisis. Contrary to what could be expected, even during the crisis the resident foreign population has increased considerably, from 2,939,000 in 2007 to 5,026,000 in 2016, but the inflow stream declined year by year from 386,000 entries in 2011 to 280,000 in 2015 (-27%) and the stock increase is more and more due to growing numbers of new births. What has collapsed because of the crisis is the job as a cause of arrival. Between 2013 and 2014, in the case of non-EU immigrants, residence permits for work reasons fell by 32.5%: of the 100 new non-EU immigrants, 40.8% came for family reasons, 36.2% for other reasons and only 23% for work. In 2015, only 9.1% of non-EU workers came for work and 44.8% for family reasons. In 2010, work reasons covered nearly 60% of entries. Lastly, in these years of crisis, emigration of Italians to foreign countries and emigration of Italians of foreign origin have increased (44,696 and 23,000 respectively in 2015, but these are largely underestimated) (Istat 2016a), (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016), (Istat 2016b).

Despite this, the growth of the foreign population has increased the stock of foreign workers, which went from 1,790,190 in 2009 to 2,359,065 in 2015,ie from 7.9% to 10.5% of total employment. If we consider that between 2008 and 2013, the number of indigenous workers decreased by 1,393,000 (-7.7%),the great contribution that foreign work has given to curbing the employment effects of the crisis and above all the aging of the Italian population is appreciated. 47% of the immigrant population is occupied (2015) against 37% of the indigenous population,this contrasts with the high structural dependence index of the total population (55.5%) (Fondazione Leone Moressa2016), (our elaborations by Istat 2016c).In general, the increase in foreign employment and, as we shall see, its de-qualification, is not only the product of the need to replace the decline of the indigenous active population, not only of the increasing need for care staff, but also of the fact that the crisis has led to claim low-cost labor (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016).

Employment rate falls, unemployment is rising.

If the foreign working population is increased, however, the employment rate has fallen sharply by 2013 (67.1% in 2007, 64.3% in 2009, 58.3% in 2013). The year 2015, however, has been a turning point for both native and immigrant employment: the resumption of immigrant employment in 2014, 2015 and 2016 has led the employment rate to 58.5%, 58.9%, 60.5%, but it is far from recovering pre-crisis employment rates. Above all, until 2013, the unemployment rate of immigrants has risen from 11.2% in 2009 to the highest point in 2013 (17.2%), then to 16.9% (2014), to 16.2% (2015) and 15.5% (2016).In these same years, the rates of employment and unemployment of indigenous peoples have changed much less, and this means that the crisis has affected more the immigrant than the indigenous workers, although foreigners are more easily recruited because of the more flexible nature of the sectors in which they work (Fondazione Leone Moressa 2016), (Direzione generale dell'immigrazione e delle politiche di integrazione 2016), (Direzione generale dell'immigrazione e delle politiche di integrazione 2017), (Fondazione Leone Moressa 2014).

The unemployment situation of immigrants has, however, effects on the worst livelihood than for Italians, indeed immigrants are mostly employees (87.5% versus 74.2% of Italian workers) and have almost no income from capital and pensions.The average overall wealth of the immigrant family in 2014 amounted to 38,000 euros, that of the Italian family to 230,000 (Fondazione Leone Moressa 2016).As a result, in 2015 it was found that 15.5% of households of EU immigrants and

14.1% of non-Community households had no income, compared to 7.6% of Italian households (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016).With regard to the role of family social cushion (often dispersed between country of origin and other third countries) it is far less effective than for Italians because, more often than indigenous,the immigrant's family consists of a single individual.

There is growing professional segregation and the precariousness of employment.

The most serious effects of the crisis on foreign workers are, however, the increase in their employment segregation, increased de-qualification of the job and increased flexibility and precarious employment. All this, in addition to curbing their social integration, decreases their standard of living and increases the cost of assistance to them by the community.

The economic downturn and the structural decline of Italy have hit mainly construction and manufacturing and, therefore, in these areas the foreign employment has decreased.It has increased, however, in agriculture, commerce, hotels and restaurants and especially in services, especially personal services (home care and care).In the tourism sector the increase in immigrant employment is particularly the case for domestic workers, restaurant workers, cleaners and scavengers.The foundries, welders, tinsmiths, coppersmiths, construction craftsmen and skilled workers in the buildings have decreased.In short, the crisis has increased the number of foreigners in the less strategic, less productive, less technological sectors and, within, less skilled and more dangerous jobs.This has also occurred in the persistence of the greater incidence of accidents at work compared to indigenous workers.

Tab. 1.*Occupied Foreigners by Economic Employment Sector (over 15 years). Years 2007-2013 (percentages)* (Fondazione Leone Moressa 2014, p. 51).

Economic sector	2013	2007	Diff. % 2007/2013
Agriculture, Forestry and Fishing	4,7	3,5	1,2
Industry in the strict sense	13,5	18,4	-4,9
Building	13,3	17,1	-3,8
Trade	8,5	9,1	-0,5
Hotels and restaurants	9,3	8,7	0,6

Transport and communication	5,1	4,1	0,9
Real estate and financial activities, business services	7,0	8,7	-1,7
Education, Health, Social Services, Public Administration	4,8	5,1	-0,3
Other collective and personal services	28,9	20,5	8,4
Totale	100, 0	100,0	

Tab 2.*Foreigners employed (over 15 years) by employment sector* (Fondazione Leone Moressa 2016, p. 53).

	Distr. 2015 (%)	Diff. 2015-2011 (%)
Agriculture	5,6	1,2
Industry	18,5	- 1,5
Building	10,1	- 4,4
Trade, hotels and restaurants	18,8	1,6
Services	47,0	3,2

The decline in employment in manufacturing and construction and the increase in services is also the reason why the employment rate between 2007 and 2013 has fallen especially for males (-15.4%) and much less for women (-2.0%).In short, the crisis has led many women to work to replace the salary lost by their husband, but this has resulted in greater employment segregation (Fondazione Leone Moressa 2014). Moreover, although female employment has slightly fallen, it is still considerably lower than that of men and this is one of the major problems in the immigrant labor market, especially for non-Community female workers whose employment rate in 2015 was only 45.6%, against 57.8% of EU female immigrants (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016). The crisis has also dramatically reduced the already low presence of foreigners in qualified jobs and increased their inclusion in the unskilled ones.

Tab. 3.*Foreigners employed by type of profession (over 15 years). Years 2007-2015 (percentages),* (Fondazione Leone Moressa 2014, p. 55)[1].

Economic sector	2013	2007	Diff. % 2013-2007
High and qualified professions	6,1	9,9	-3,9
Executive work in office work	1,9	3,3	-1,4
Qualified professions in trade and services	24,1	15,4	8,7
Craftsmen, skilled workers and farmers	22,7	30,4	-7,7
Plant conductors, fixed and mobile machinery workers, and vehicle drivers	10,0	12,6	-2,6
Unqualifiedprofessions	35,3	28,5	6,8
Total	100,0	100,0	

The process of ethnicizing some of the typical occupations of immigrants has intensified (Fondazione Leone Moressa 2014). Filipinos, Ukrainians, Sri Lankans, Moldavians, Equadorans (especially women) are mostly absorbed by collective and personal services; Ghanaians, Indians, Pakistanis, Chinese and Moroccans are predominantly occupied in industry; Tunisians and Albanians especially in construction, Indians in agriculture, Egyptians, especially in hotels and restaurants, building and real estate activities, and so on (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016).Professional segregation is only partially justified by the difference in education and qualification compared to Italian workers, since if the number of workers with only elementary license (8.6% versus 3.1%) is highest among foreigners, and if percentage of graduates is almost half that of indigenous workers (12.3% vs. 22.1%), however, the distribution of the lower secondary school (36.1% vs 27.2%) and of the upper secondary school (43% vs. 47.7%) is almost the same (Direzionegeneraledell'immigrazione e dellepolitiche di integrazione 2016). The rate of over-education among foreign workers is even 40.9% (Istat 2016d).

[1]Seealso Centro di ricerca per i problemi del lavoro e dell'impresa (Creli) (2012), Il ruolo degli immigrati nel mercato del lavoro italiano, Cnel e Min. Lavoro e Polit. Sociali, (http://bancadati.italialavoro.it/bdds/download?fileName=C_21_Strumento_8421_documenti_itemName_0_documento.pdf&uid=30926fbb-79f7-4a13-b1f9-a026c22e0c35); Bonifazi C. andMarini C. (2011), "Il lavoro degli stranieri in Italia in tempo di crisi", Neodemos, 11 May 2011 (http://www.neodemos.info/articoli/il-lavoro-degli-stranieri-in-tempo-di-crisi/); Zanfrini L.(2013),"Il lavoro", in Fondazione Ismu, "Diciannovesimo rapporto sulle migrazioni", F. Angeli, Milano, pp. 87-104.

As regards the type and duration of foreign workers' contracts, several factors have led to greater employment precariousness.First of all, as we have seen, comparatively increased employment in seasonal sectors, such as agriculture, hotel and tourist services, home co-workers and waiters.In addition, the *Jobs Act* (2014-2015) has increased outgoing flexibility (easier layoffs), and inbound flexibility (making it no longer necessary to justify the use of term contracts and apprenticeships).The combination of higher seasonality of immigrant professions and the *Jobs Act* is that between 2014 and 2015 both the cessations and the activations of new contracts have increased both for indigenous and immigrants. For the latter, however, fixed-term contracts have been increased and those for indefinite periods have decreased, while for indigenous people the nature of their employment and the introduction of the contract for an indefinite period with increasing protection (with the incentive for the employer of resetting the contributions for three years) has increased these.The same set of measures has also increased the worker's functional flexibility by making it more possible than in the past professional deskilling.Finally, the extension of vouchers to all types of employment and not just occasional (Law 92, 2012, so-called "Fornero Reform") has greatly extended its use.As each worker can not receive more than 7,000 euros a year through vouchers, the employer is induced to use many "voucherists".This has increased the number of employees, but has also diminished the duration of their employment.In addition, it has worsened social assistance as "voucherists" do not have the right to unemployment benefit, maternity coverage, sickness, family allowances and severance indemnity (Fondazione Leone Moressa 2014). The seasonality and occasionality of the commitments of many immigrants have made it an employment group very subject to vouchers and, therefore, to its recalled critical issues. Not to mention the "gray" work that you can extend by vouchers.

The wounds of the black labor of immigrants, which sometimes accompany, as a cause and effect, the lack of a residence permit, is even aggravated.In January 2016, Ismu estimated the presence of 435,000 irregular immigrants, or about 7.5% of the total immigrant population (Fondazione Ismu 2017). Those who have not stay permit can work only illegally, but obviously only a portion of the 435,000 irregulars are occupied, so the bulk of immigrants working illegally are not the clandestines.Much more common is the black and gray job of regular immigrants: for example, 2009, Ismu estimated that 32% of foreign workers were uneven about the contract (Ismu, Censis, Iprs, 2010). According to Istat in 2010-2012, 22.2% of Community immigrants were irregularly employed and 19.1% of non-EU nationals, who together accounted for 18.6% of all irregular workers (Istat 2015a), (Istat 2015b).In the following years the crisis has increased the rate of irregular workers in all sectors for both indigenous and foreigners (Istat 2015a).The decline in

industrial production has caused among immigrants, in addition to redundancies, their deskilling and the increase in black labor,a flow of foreigners who were already heavily occupied in the North of Italy had moved to the South for more precarious, irregular and underdeveloped jobs, while the plague of black labor and "caporalato" in the countryside expanded (Pugliese 2015), (Sacchetto and Vianello 2013), (Pugliese 2012).The highest frequency of irregular labor is recorded in domestic services where over half of irregular foreign workers are located and where in 2012 54.6% of all workers were uneven (Istat 2010), (Istat 2015a), in agriculture (Cristaldi 2015), in restaurants and in building (Rinauro 2014), (Rinauro 2015).

The lights: the tax contribution of immigrant workers and the growth of foreign entrepreneurship.

Along with the growth in the employment rate and the decline in the unemployment rate of immigrants (triggered by the slight recovery of the Italian economy since 2014), their high tax contribution and therefore welfare support persists: in 2014, contributions to Inps by only non-EU immigrants amounted to € 8 billion, but they only absorbed little more than € 3 billion in social security and social assistance (the employment rate is high, given the young age, few people avail themselves of pensions and health needs are contained). So they offered about 4.5 billion euros to Italian welfare. On the other hand, rising and rising are the costs of contrasting, welcoming and assisting refugees and asylum seekers (Fondazione Leone Moressa 2016). About immigrant entrepreneurship, just here to remember that, on the one hand, it is growing strongly and effectively countering the fall of businesses and the entrepreneurial vocation of indigenous people; on the other hand, immigrant entrepreneurship is growing in years of crisis because it is often more a mandatory choice that a vocation by those who lost their job and want to avoid the loss of the residence permit. In addition, it consists mainly of small companies with scarce capital, little investment in research and innovation and spread in non-strategic productive segments for Italian international competitiveness. In addition, its management integration with indigenous people is also very scarce. On the other hand, its inclusion in the Italian system of production districts is quite high.

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CIRCULAR ECONOMY, MIGRATION AND DEVELOPMENT: ITALY AND COUNTRIES WITH STRONG MIGRATORY PRESSURE

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Sommario

Al cuore di questo lavoro vi è la consapevolezza che abbiamo bisogno di ripensare i modelli di sviluppo usando *paradigmi circolari*. In questo articolo prendiamo in considerazione due di essi, "economia circolare" e "migrazioni circolari", che sono elementi fondamentali per un modello di sviluppo sostenibile - lo chiamiamo "sviluppo circolare" - che può adeguatamente coinvolgere le società euro-africane. Lo sviluppo circolare è un modello proposto come possibile risposta allo stallo economico che l'Italia e altri paesi con alta pressione migratoria sembrano sperimentare. Esso può affermarsi con il contributo dei varistakeholder della società e necessita di una forte visione politica.

Abstract

At the core of this work is the awareness that we need to rethink development models using *circular paradigms*. In this paper we look at two of them, "circular economy" and "circular migrations",whichare fundamental elements for a model of sustainable development - we call it "circular development"- that can adequately involve Euro-African societies. Circular development is a model proposed as a viable response to the economic gridlock that Italy and other countries with high migration pressure seem to experience. It grows with the contribution of the many stakeholders of society and it needs a strong political vision.

Keywords
Circular paradigms, migrants, sustainable development policies, Italy, Euro-African societies

Introduction

This paper aims at highlighting sustainabledevelopment paths in Italy and sending countries,looking at migrants not just as a "useful labour force", but as a "constituency force" equally entitled to express their potential and play a central role in development policies. Its perspective pivots on immigration as one of the most impactful ongoing social changes.

At the core of the work is the awareness that we need to rethink development models using *circular*

paradigms. In this paper we look at two of them, "circular economy"[1] and "circular migrations"[2], well aware that the two "circularities" are not the only ones we could take into consideration, they refer to very different dynamics and may not appear immediately connected. Nevertheless, it is the conviction of the writers that nowadays these two circularitiesare fundamental elements for a model of sustainable developmentthat can adequately involve Euro-African societies to create a fluid space not just for exploitative trade exchanges, but also for a regenerative economy based on knowledge and innovation. In this perspective - that we call *circular development* - better ecosystems, efficient rural economies and a new youth friendly urbanism in Africa would create a perfect match for some stagnant European societies (and defuse the immigration "threat").

In the last ten years, the international scenario became more and more complex due to a variety of factors, often strongly argued and subjected to hard policy decisions. However, as far as the European and the South of Mediterranean Countries are concerned, some of them were undoubtedly very important, such as: the ongoing financial and economic crisis, the Arab springs, the turmoil in the Middle East, the refugee crisis and the institutional reforms processes started in many regions. Italy, being at the frontline of the Euro Mediterranean geo political scenario, suffered the most direct impact.

The first part of the paper depicts immigration in Italy within a compass with four cardinal points: the general framework, the legal framework, the collective consciousness and the demographic magnitude and trends.

The second part connects circular migrations to circular economy, thinking at the possible outcome as circular development.

The third part explores the role of key actors such as supranational, national and local Governments, International Organisations, Development Agencies, profit and non-profit institutions, universities, whereas circular development is a viable approach, on the horizon of the Sustainable Development Goals.

The conclusions draft three key elements for a circular development deployment.

[1]For a recent review of the literature on the circular economy and on its relations with the concept of sustainability see Geissdoerfer, Savaget, Bocken, Hultink (2017).

[2]For a systematic and concise contribution on circular migration see Hugo (2013).

1. Immigration in Italy: four cardinal points

1.1. General framework: a global narrative without a global governance[3]

A recent worldwide survey (Gallup 2016) reveals that in almost every region of the world people are more likely to be in favour of migration than against it. The one, notable exception to this is Europe. Migrations in developed countries are problematic when they bring uncertainty that reflects in the fears of receiving communities (which are wealthier, safer and more secure) to lose privileges. This mentality hardly sees migrations as consequences of unequal accumulation of wealth, promotion of conflicts as a mean of regional resolutions and unidirectional environment exploitation. And improving one's own quality of living chasing job opportunities, escaping conflicts or fleeing from natural disaster is intimately human, especially when one doesn't feel responsibility or control over such causes.

Certainly, migrations have moral implications being consequences of - and having impacts on - the way human relationships are conceived (connected versus disconnected) and environment is respected (exploited versusnurtured). Pragmatically, there's need of a structured multinational debate where the normative reflection could be treated within the grounds-of-justice. Hopefully, this would feature restrictive practices as problematic because they are at odds with the fact that our planet belongs to humanity collectively. A fair approach would extend the principles of re-distributive justice to migration as it applies to shared membership in a state, shared subjection to a global trade system, shared humanity and undivided ownership of the earth.

Consequently, less restrictive immigration policies should not merely be demanded as one possible way of aiding the poor, but should be required as such (United Nations Development Programme 2009).

1.2. Italian legal framework: lack of long term strategic vision?

Today, there are very narrow routes for people from developing countries to officially access Italy. Moreover, some of the mechanisms that regulate migrants lives in Italy are difficult and hermetic, they can generate social exclusion, and the more migrants enter the "underworld" the less they can be assessed and monitored, making public issues, from security to health, more uncontrollable.[4]

The lack of management in reception policies creates cases like Turin - where 1600 migrants and refugees are occupying the Olympic Village - or Rome - where the Salaam Palace and other 19

[3]See also Brugnoli, Matteini (2018).

[4] International Organization for Migration (2016) estimates that 10-15% of the immigrants' population is illegal.

buildings are occupied by 3,500 migrants. None of these cases seem to have any ongoing solutions, nor the other 36 illegal settlements reported in the rest of the country.

The more the current "entry, stay, expulsion and inclusion" legal framework is made user friendly, the more the migrants could comply with legal requirements and would "emerge".

The international protection system needs to be reformed and the EU should find an agreement that shares responsibilities fairly beyond the unattended Dublin regulation[5]. On the verge of a new demographic era where south/north migrations are expected to be consistent, Italy should come up with an original strategy to deal with people on the move.

1.3. Collective consciousness: the Italian dream adrift

The collective imagery of Italians on immigration has been forged through events that can't be deleted from its memory. The key episodes have brought awareness in many aspects: the landing of Vlora ship in Bari in 1991 made Italians discover how their country was desirable from Albanians and what a massive immigration process may signify in terms of social response. The Uprising of Rosarno in 2008 brought to light that there existed inside the country an underclass of African workers that were living in conditions comparable with ones in the countries they had fled. The wreckage of Lampedusa in 2013 signified that Italy couldn't tackle forced immigration on its own, but that it took a strong collective international action.

Today we need a new narrative on migrations that inform on the reasons that push people on the move, about the scale of global transformations and about the need of a transnational governance.

1.4. Demographic magnitude and trends: the Italian-African communicating vessels

Italy's population is shrinking and migration is one of the factors that can support it in the long run demographically and economically. The Italian-African relations are at the core of both sides future development for at least three good reasons.

Firstly, the African immigration segment is the fastest growing in Italy, with Gambian (+209%), Malian (+135%) and Nigerian (+68%) showing the sharpest increase last year; new national groups have very different cultural characteristics both from Italian society and from older African immigrant communities (Moroccan, Tunisian, Egyptian).

Secondly, Africa is on the verge of a demographic boom with more than half of global population growth between now and 2050 expected to occur there. By then, Europe, whose current median age is 42 and fertility rate 1.6, will shrink to 707 million (-31 million) while Africa, whose current

[5]The Dublin Regulation (Regulation No. 604/2013) is a European Union (EU) law that determines the EU Member State responsible to examine an application for asylum seekers asking for international protection under the Geneva Convention and the EU Qualification Directive, within the European Union.

median age is 22 and fertility rate 4.3, will double to 2.478 billion. Population growth remains especially high in the group of 48 countries designated by the United Nations as the least developed countries, of which 27 are in Africa. Moreover, by 2034 Africa is expected to have the world's largest working-age population, reaching 1.1 billion (United Nations Department of Economic and Social Affairs 2015).

Finally, in sharp contrast, the populations of some European countries such as Romania, Ukraine and Republic of Moldova, which are currently 1st, 5th and 8th migrant groups in Italy with some 1,524,389, collectively are expected to see their populations decline by more than 15% by 2050.

Italy is a much different country from twenty years ago, and it will be radically different in the decades to come. Migrants currently account for 11% of the workforce, 10.6% of employees, and generate 120 billion euros that equals 8.7% of Italian GDP (Idos Centro Studi e Ricerche 2015). In 2015 there were 4 million migrants in the 15–64 age range, which equals 10% of total; this will increase to 7 million in 2065 or approximately 23% (Istat 2016). Consequently, in the near future, their capacity to participate in the job market, to access qualitative jobs and to raise their incomes will be crucial to Italian economy. As stated by Centro StudiConfindustria(2016), up to now immigrant labour has allowed Italians to work more, perform more complex jobs, be more productive and earn more. The current concentration of migrants in less profitable and innovative industries, occupying *dirty, dangerous and demanding* jobs for low salaries (the average salary of migrants is one third of those of Italians) is rather a condition for those industries to exists, then a salary dumping. We need to think about what those 7 million *immigrant jobs* in 2065 would be like. If they will still be *dirty, dangerous and demanding* occupations for low salaries, Italy will probably have lost its battle for competitiveness. If they will be innovative occupations, unleashing the whole immigrants' potential, their energy, resilience and diversity, surely Italian economy will be stronger.

2. Circular development: a paradigm for regional sustainable growth

2.1. Circular economy: a regenerative capitalism model

> "A circular economy is a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling." (Geissdoerfer, Savaget, Bocken, Hultink 2017).

Indeed, raw materials, energy and technologies, from one side, and waste, emissions and energy leakage, from the other side, are all included in the same frame, even if alongside the production-consumption chain actors often think and act with divergent visions. In fact, circular economy criteria need a strong commitment from producers, consumers and public institutions.

Companies have to get ahead of rivals by innovating for both resource efficiency and customer value. Rethinking products implies that they change their culture including designing processes, research approaches, production techniques and their management styles sometimes in contrast to a 'take, make, dispose' linear economy model. Customers are facing an unexpected increase of choices and a widened possibility to become active part of the circular economy, whereas not only consuming, not consuming, sharing and upcycling can be a daily decision in everyone's life, but also creating own produced individual items has made possible thanks to new technologies. All this left no choice to institutions than supporting circular economy with sensible policies.

Circular economy approaches are valuable at driving innovation in manufacturing processes, waste management and consumption patterns andto some extent it can be supportive to biodiversity. The question is if circular economy it is anyhow linked to human diversity. Some studies (Florida 2005) showed that the wealthiest cities are those where the creative class became prominent: designers, scientists, artists and other type of young professionals create the conditions for cities to prosper promoting gender, race and lifestyle diversity. Those are also the categories that mostly create, demand and consume circular economy based product and services. It is arguable that this urban culture, while attracting talents from everywhere and pushing urban economies to call for freer access for international workers, it is also making these cities more expensive and potentially exclusive.

A robust model that capitalizes on circularity, creating growth and profitability, envisaging an ecosystem with partners, suppliers and market is still underdeveloped. What is at stake is a systemic change towards a "regenerative" capitalism (Fullerton 2015) that shed new light on the importance of fairness, and the unsustainability of high and growing inequality, maintaining the dynamism of a truly free enterprise system that taps into the unique essence of individual human creativity and drive. This might guarantee a level of growth and wealth, at the same time equitable and inclusive.

2.2. Circular migrations: fluid movement of interconnected people

> "Circular migration refers to repeated migration experiences between an origin and destination involving more than one migration and return." (Hugo 2013)

> "Although circular migration has long been an important type of human mobility, in the contemporary world it has gained increased significance for two reasons: (1) modern forms of transportation make it increasingly feasible (in terms of money and time) to circulate between two "homes", and (2) modern forms of communication make it increasingly possible to stay immediately and intimately connected to both homes." (Hugo 2013)

International migrationsare at the core of Italian and European political debate. Italian policies historically thought about immigration as "useful labour force" designing its immigration policies around the workforce needed in various industries. Truly it never worked; the majority of immigrants were allowed into the country through extraordinary measures that distorted the original intentions. This would imply an unfocused design of integration measures and a degree of acceptance of misconduct in labour exploitation and human rights. The immigration model empowered by Italian Governments levered on a win-win (win) strategy in which migrants get jobs and support their families, countries of origin gain remittances and Italy gets its *dirty, dangerous and demanding* jobs covered. This "status quo" was undermined by the decrement in jobs available, the erosion of purchasing power, the decreasing of saving capacity and the legalization of many jobs previously left in the grey area of tax evasion.

Recently, due to the economic crisis in Italy and to the geopolitical crisis on the other side of Mediterranean, other streams of migration got more and more consistent: immigrant leaving Italy heading back to their countries of origin, immigrants heading to other European countries, seasonal workers, nomadic workers, family reunions, unaccompanied minors, refugees and transiting people. The idea that migrations aren't linear[6] and abide cultural and economic assimilation is changing the already fragile Italian reception system and queries the entire welfare system. Italy can be temporary home for migrants for many reasons, as it has previously been for the 60,000 Italian born that last year decided to leave the country. Immigration in Italy has never been so fluid and both hard (demography, jobs, income, costs generated) and soft (cultural, political and societal changes) impacts on Italian society are difficult to grasp. What is new is the perception that a novel, urban, technology savvy, cross cultural, community based economy could be more capable to capture the potential of temporary communities and help build upon it.

2.3. Circular development: a common "play-ground" for Europe and Africa

Given the deep implications of Euro-Mediterranean interconnections at every level, it is not

[6]For a contribution on circular migration in the Mediterranean area see Fargues (2008).

exaggerated to talk of a necessary co-development. Countries like France, Italy, Portugal and Spain can somehow be considered a common geopolitical region with African countries. Also, the ecosystem is interdependent. The International Organization for Migration (2016) confirmed that degradation of the ecosystem and natural disasters caused by climate change are key drivers of migration and displacement while already the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007) stated that climate change was having discernible and indeed worsening effects on communities. The developing world would have carried the heaviest burden, despite having contributed least to the greenhouse gas emissions responsible for it. In spite of this, southern countries have less resources and capabilities to adapt to environment changes compared to developed countries.

What is new is the perception that a novel, urban, technology savvy, cross cultural, community based economy could be more capable to capture the potential of temporary communities and help build upon it.

In this contest of interdependency, a *circular development* can be obtained as the integration of the virtuosity of the circular economy and circular migrations (Brugnoli, Matteini 2018). A Euro-Mediterranean circular development strategy would be an opportunity to enlarge markets, achieve a fairer redistribution of wealth, reduce inequalities inside and between countries, decrease exploitations of natural resources, accelerate transfer of scientific knowledge, widen digital spaces. The Circular development is also based on contaminations of different transnational communities (i.e. North-South) and different human groups (activists, tech savvy, businesses, academics, policy makers). The open source culture can create a common base of scientific knowledge and data, as well as opportunities for peer to peer interactions to become factual. This circular knowledge allows circular innovations to rise even in deprived contexts.

Of course, such circular development relies on a new *regenerative* type of capitalism, which needs institutions to ignite and overview its governance. Such institutions not only would promote environmentally friendlier productive systems, but also a more equitable resource allocation, a wider and more qualitative job market, an open access to data, a more democratic process for corporate decisions and a global welfare system. All this probably will slow down the growth rate by using capital more patiently, but it probably will lead to a more equitable development that make human circulation more functional.

2.4. Would this new societal setting embed immigrants in its core functioning?

In 2016, after 4 years, Italian economy turned positive and old resilient businesses that survived could expand, while new innovative circular economy based businesses could provide more

qualitative jobs. The start-ups ecosystem for example, even if at the moment involves only 2% of migrants, creates demand for more traditional services.

The future business environment is meant to favour workers' rapid changes, nomadism, social commitment, sharing of spaces, ideas and occupations. Such scenario could fit particularly to skilled migrants and second generations, and it could represent a favourable scenario for other migrant groups, if the reception system could provide tailor made solutions to include them and the legislative framework could create more agile accesses.

Circular development means more qualified jobs in new impacting industries in Italy and in sending countries. If public investments, private investments, open access to knowledge and sharing economy are addressed according to a Euro-African circular development model, immigration would be less of a problem.

3. The role of institutional actors

Some strategies of key actors, such as supranational, national and local Governments, International Organisations, Development Agencies, profit and non-profit institutions, universities, are already going in the direction of favouring a potential circular development.

However, in order to achieve the goal, it takes rethinking supranational, national and sub-national policies in a multi-level, multi-sector, multi-actor perspective on the horizon of the SDGs, and, specifically, a positive approach to immigrants' inclusion should seriously consider creating the conditions for decent works; promote inclusive and sustainable industrialization and foster innovation; reduce income inequality within and among countries; ensure inclusive and equitable quality education and promote lifelong learning, ensure healthy lives and promote well-being for all at all ages. Moreover, the approach stated in the SDG Number 17 "Revitalize the global partnership for sustainable development" should be considered carefully, above all for the systemic issues:

- *Policy and institutional coherence:*
    - Enhance global macroeconomic stability, including through policy coordination and policy coherence;
    - Enhance policy coherence for sustainable development;
    - Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development;
- *Multi-stakeholder partnerships:*
    - Enhance the global partnership for sustainable development, complemented by multi-

stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries;

- Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships;

- *Data, monitoring and accountability:*
  - By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts;
  - By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries.

Conclusions

Circular development is a model proposed as a viable response to the economic gridlock that Italy and countries with high migration pressure seem to experience. It grows with the contribution of the many levels of society: citizens, companies, non-for-profit institutions, supranational, national and local Governments, International Organizations, Development Agencies and it needs a strong political vision.

The shift from a "take, make, dispose" to a "circular vision" of development can also shape a new way of thinking north-south relationships. In example:

Designing. Co-designing a stronger economic cooperation, focused exclusively on circular economies, including companies, b-corps, venture philanthropy and civil society representatives from Italy and key African countries. Italy should share its excellence in clean energy and recycling with African countries so that new jobs are generated. Governments could create bilateral policies to allow African students, workers, entrepreneurs to join Italian economies in such industrial sectors.

Producing. Growing African economies and Italy will increase their mutual prosperity with new circular economy schemes that will help African countries to rationalize energy, avoiding waste emergency, increasing food security and developing tourism. Italian Universities, Innovation

centres, think tanks and fab labs with African counterparts can co-create technology based "zero impact machines", specifically for rural communities, increasing local job and business opportunities for Italian investors. Industrial symbiosis allows waste or by-products of one industry to become inputs for another.

Reusing. The circular development idea stems from the awareness that Italian and European countries won't be able to achieve any sustainable development if they leave behind the populations south of the Mediterranean. The circular stream of products and processes should be extended to knowledge and communication and must include people and jobs. Not only South to North movement, but also the opposite. There are segments of the Italian labour force that have lost or still haven't gained enough potential that can otherwise be effective contributors in African job markets. This would be the case for junior graduate, researchers, technicians, workers displaced or young retirees, who are willing to cross-adapt their competences in different environments.

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SESSIONI SPECIALI

A MODEL OF THE ROLE OF EDUCATION IN 2015 UN INTERNATIONAL MIGRATION DATA

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Sommario

Le migrazioni a scala globale sono chiaramentelegatea una molteplicità di cause che, oltre ai fattori economici, comprendono i conflitti, i disastri naturali, le condizioni politiche locali. Tuttavia è possibile cercare di evidenziare quali sono le principali variabili che sono alla base dei movimenti migratori tra macro aree del pianeta. Questo studio analizza i dati del rapporto ONU 2015 e li interpreta attraverso un modello gravitazionale, le cui variabili indipendenti sono indicatori della situazione socio-economica di una popolazione. Eliminando progressivamente i contributi meno significativi, si evidenzia che il livello d'istruzione dei migranti è uno dei fattori più importanti.

Abstract

Migration on a global scale is clearly linked to a multiplicity of causes that, in addition to economic factors, include conflicts, natural disasters and local political conditions. However, it is possible to pinpoint what are the main variables that underlie migratory movements between macro areas of the planet. This study analyzes the 2015 UN report data and interprets them through a gravitational model, whose independent variables are indicators of the socio-economic situation of a population. Progressively eliminating the less significant contributions, the level of education of migrants emerges as one of the most important factors.

Keywords

Gravitational model, multiple regression, UN statistical subdivision, migrants' expected schooling

Introduction

The possibility to decide where to live is among the parameters that underlie human freedom (UNPD 2009).Modern transport has made the movement of people easier, cheaper and faster. At the same time, conflicts, poverty, inequality and environmental changesare pushing people to abandon their homes in search of better opportunities for themselves and their families (United Nations 2016).

International migrations is connected to demographic aspects, economics, cultures and policies around the world (Kim and Cohen 2010) and, in many areas, remains one of the few options for people, especially young, to seek a decent life (United Nations 2015). On the other hand, in countries that have witnessed a decline in fertility and a rapidly aging population, international migration has become an increasingly important contribution to economy and society (Kim and Cohen, 2010). In Europe, for example, the population would have declined during the last 15 years without positive migration, while in Africa, Asia, and Latin America, the negative migration rate has marginally contributed to slow down the pace of population growth (United Nations 2016). The 2030 Agenda for Sustainable Development recognizes the positive contribution of migrants for inclusive growth and sustainable development and describes how international migration is a multidimensional reality of major importance for the development of countries of origin, transit and destination (United Nations 2015).

The large number of implications that migrations generate on the planet (Kandemir 2012)make migration a truly interdisciplinary field of research involving demography and economy, as well as geography, ethnology, policyand psychology. Migration,however, has to date less developed mathematical tools that explain it, with respect other factors such as fertility, or mortality (Aleshkovski and Ionstev 2006).

The United Nations (UN) define human migration as the movement of people from one place in the world to another in order to obtain permanent or semi-permanent residence. These movements can occur across borders or within them; they can be voluntary (for work, study or family reasons) or forced (resulting from conflicts or natural disasters); regular (with documentation) or irregular (without documentation); temporary, seasonal or long-term (UNDP 2010).

The number of international migrants in the world, i.e. the number of those who no longer live in their country of origin, has continued to grow rapidly in recent years reaching 244 million migrants in 2015, corresponding to about 3.3% of the world's population (it was 2.8% in 2000), thus exceeding the rate of growth of the world population. (United Nations 2016). The map in Figure 1 represents the global flows at the continent level. The various areas of the world are also classified according to the level of human development index (HDI).

The map shows that most movements take place within continents. Among these, Asia and Europe are the continents with the highest numbers in terms of migrants. Among the flows between continents, those between South and North America and from Asia to Europe are the most relevant.International

migrations represent however only a minority of those who have abandoned their homes. Globally, in fact, many more people move within their national borders rather than going abroad (UNDP 2010). According to the United Nations Development Program (UNDP 2009), the number of internal migrants, i.e. those who moved within their national borders, amounted to about 740 million in 2009, about 4 times higher than that of international migrants. This means that about 1 person out of 7 in the world does not live where he/she was born.

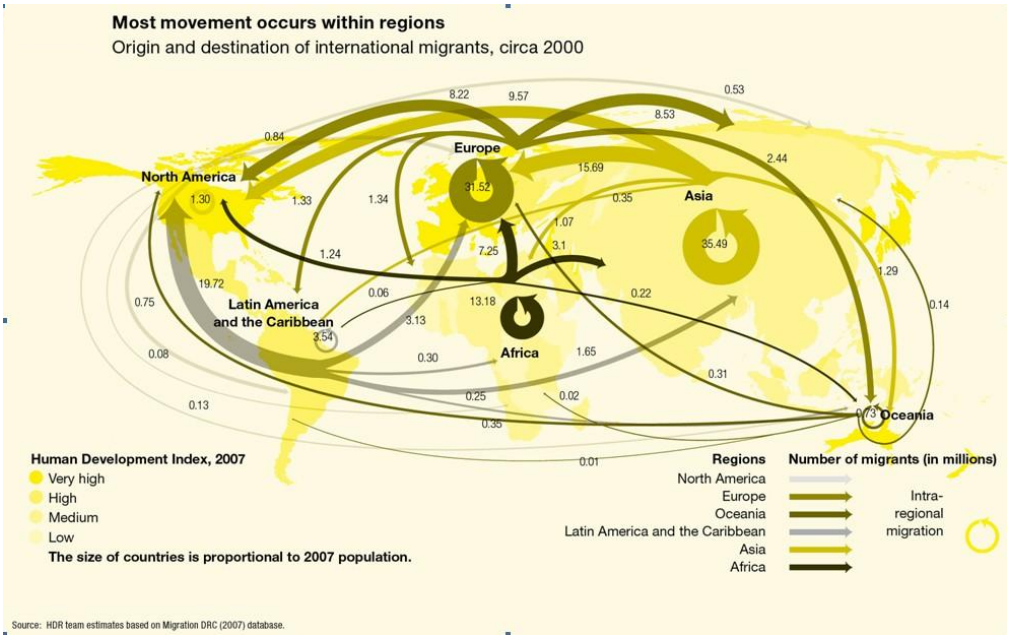

Figure 1, International migration flows (Source: UNDP 2010).

The United Nations High Commissioner for Refugees (UNHCR) indicates also an increased number of involuntary migrants that reached a record level of 65.3 millionin 2015, 5.8 million more than the previous year.These include individuals moving around the world due to persecution, conflicts, violence or human rights violations. Of these, 21.3 million are refugees, 40.8 displaced internally in their countries of origin and 3.2 asylum seekers. Furthermore, climate change and all the consequent natural disasters further increased human mobility and displacement (UNHCR 2009): The International Displacement Monitoring Center (IDMC) in 2014 estimated a number of people displaced from their homes due to disasters caused by natural hazards amounting to 19.3 million.

Migration Models

Migratory models can be defined theoretically or empirically, even ifalso empirical models require some theoretical foundations at the base. (Greenwood 2005). To date, there is no widely acceptedgeneral theory on international migration but only a large number of proposals that have been mostly developed in isolation from one another (Massey et al. 1993).

The early neoclassic theory sees the labor market as the main driver to control migration flows. Authors see this factor either translated into country level policies (Lewis 1954, Ranis and Fei 1961, Harris and Todaro 1970), or as influencing the individual choices of migrants (Sjaastad 1962, Todaro 1969, 1989, Todaro and Maruszko 1987).

Later,Taylor (1986) and Stark (1991) pointed out that families could be interested in diversifying their income risk though migration even if salaries are similar in both the origin and the destination countries. Piore (1979) underlined the role of attractive factors in the destination countries, more than the situation in the countries of origin.A recent account on migration theories and applications can be found in White (ed.) (2016).

Despite all these studies, the "Migration Laws" first developed by E. Ravenstein in 1885, examining migration data in European Countries and the US still appear to be valid in many cases (Aleshkovski and Iontsev 2006). These laws can be summarized as follows:

- Most migrants rarely travel long distances, usually moving a short distance to large cities. Long distance migrations are usually undertaken by people from large cities.
- Most migrations take place from rural areas to urban areas.
- Most migrants include young males between the ages of 20 and 45.
- Each migratory flow produces at least one in the opposite direction.
- Within countries, women migrate more than men.
- Migration increases in volume with the development of industry and transport.
- Much of migration depends on economic reasons.
- Moving towards destination centers (usually large cities) migrants leave "empty places" in their place of origin that are occupied by other migrants.
- The native inhabitants of the cities are less prone to migration than those from the rural areas of the country.

Though still seeing economic reasons behind most migration flows, the laws underline some important social and geographical aspects of the phenomenon. These points have been better outlined by Lee (1966) that sees the migration flows as dependent upon three types of causes: The push factors, the pull factors, and the intervening obstacles (see Figure 2).

According to this model, in every area there are many different factors that induce a person to stay within the area or attract other people to it, and other factors that tend to repel them. These are shown in Figure 2 as "+" and "-" signs. There are others, listed as "0",toward which people are basically indifferent. Some factors influence people in the same way, while others have different effects (for instance, climate can affect most people in the same way, why education is less relevant in families without children). Also, if one considers any two points in space, there are a number of obstacles between them. The most studied is the "distance", meaning not only the number of kilometers between the two points, but also the differences in culture, religion, and life styles. All these factors are mediated by personal perception and in fact, in many cases, the objective value of the factors is less relevant than the way they are perceived. Furthermore, the decision to migrate is not always a choice based on rationality and for some people the irrational component (imitation, friendship, hope…) is the dominant one. It is therefore expected to find numerous exceptions to any form ofgeneralized explanation of the migration phenomenon.

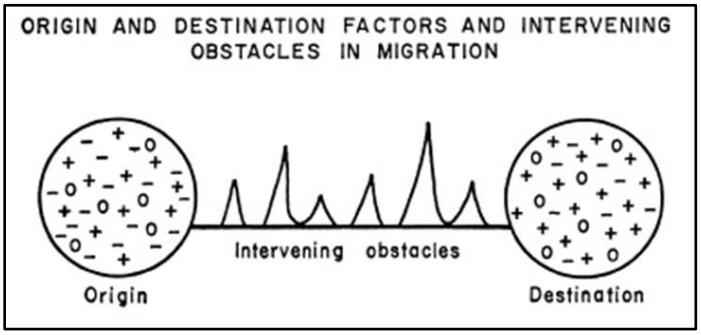

Figure 2, A scheme of push and pull factors according to Lee (1966).

Mathematical formulation

The gravitational model of migration, at the root of the approachused the current study, is a model of urban geography derived from Newton's law of gravitation and, according to Claydon (2012)

constitutes one of the main developments in terms of modeling the phenomenon of migration. It is used to predict the degree of interaction between two areas (Letouzé et al. 2009) and expresses some kind of demographic factor as the product of two indicators of the "mass" of the two areas divided by a function of their "distance". For instance, Steward (1940) formulated it as

$$F_{ij} = G \cdot \frac{P_i . P_j}{D_{ij}^2}$$

Where the demographic force F_{ij} between two countries i and j is assumed to be proportional to the product of their population $P_i$and P_j divided by the square of their distance D_{ij}.

The gravitational model of migration is therefore based on the idea that with the growth of the mass(measured by population, in the Steward's approach) of the two places, there is an increase in the movement between them. Instead, the farther the two places are away, the lower the movement is.

The gravitational model has been extended in two directions. The first is the possibility of using some exponent β of the country "masses" to represent different types of influences (e.g. through positive or negative values of the exponents) as well as adopting a generic exponent α for the distance (and not force it to be the square), i.e.

$$F_{ij} = G \cdot \frac{P_i^{\beta 1} \cdot P_j^{\beta 2}}{D_{ij}^{\alpha}}$$

The second is to assume that the numerator can be the product of more than two terms, thus allowing the model to include most of the push and pull factors devised by Lee. In quite the same way, the denominator may be representative by any measure of the distance, but, being it a constant once i and j are defined, it may also be incorporated in the constant of the formula.

In the end, the generalized gravitational model, after applying the logarithms, may be expressed the following form:

$$\ln F_{ij} = \ln \beta_0 + \beta_{1i} \ln P_{1i} + \beta_{2i} \ln P_{2i} + ... + \beta_{1j} \ln P_{1j} + \beta_{2j} \ln P_{2j} + \cdots + \varepsilon_{ij}$$

Where all the P_{ki} and P_{kj} represent the different factors taken into account in both the origin (i) and the destination (j) areas and ε_{ij} should result in a white noise. The last form is very convenient since it is linear in the parameters $\ln\beta_o$ and β_{kh} to be estimated and thus allowsadopting the well-known least square techniques for their determination, once a measure of the demographic force F_{ij} and of the factors P_{kh} has been defined.

Materials and methods

Migration data set

All the evaluations of the current work are based on UN data, which subdivide the world into 22 statistical regions, represented in Figure 3. They have been defined as belonging to the same continents, and represent aggregation of countries that can be considered as sufficiently "close" to each other (for population, traditions, economy, religion,…) beside been physically adjacent.

Caribbean, Polynesia, Melanesia, and Micronesia were not considered due to the very small migration fluxes, thus reducing the considered regions to 18. For each region, UN data report the number of dwellers coming from each other region and living permanently there in 2015, as well as those leaving in 2010. Two types of models are thus possible. The first to interpret the global movements up to 2015, and the second to describe only the variations that took place between 2010 and 2015. Both types will be dealt with in the next section even if both present some problems. The situation in 2015 may represent also some old flows that took place in condition quite different from the current ones, the difference of the last five years may present negative values in those areas where the number of immigrants has decreased, which constitute a problem from the computational viewpoint. In both cases, however, the migration rate (i.e. number of migrants divided by the population of the origin area) has been used as independent variable to avoid the obvious discrepancies due to the quite different population of the macro regions.

Figure3 – Statistical regions as defined by the UN (From: unstats.un.org).

The regression models

Even if it is evident that regression models as those illustrated above may not have causal or predictive meaning, in this section we try to estimate the parameters of a model that correlates migratory flows with economic, geographical, demographic and development indicators, considered as possible useful factors to explain the trend of global migration. We are well aware that such an approach does not allow to "understand" the phenomenon of migrations, since we limit ourselves to a simple mathematical approach, without investigating all the social, personal, historical, political, natural and psychological factors that push people to abandon the their country of origin to go and live elsewhere.Nevertheless, exactly for the complexity of the phenomenon we deem it useful to understand to which other factors it is more linked, at least at a global scale.

As to the possible independent variables (or regressors) that have been assumed, their choice has been based on a number of criteria derived from the theories presented earlier. They should be representative of:

- Economic factors: as the degree of employment and salaries (as in Neoclassical Theory).
- Demographic factors: as the average age of the population, whose importance emerges for example in the Labor Market theories.
- Geographical factors (distance and boundaries in our analysis), whose importance is recognized by all models.
- Other factors indicating the well-being of the population: life expectancy at birth, inequality coefficient, education. Recent studies on migration are giving increasingly importance to these parameters since the latest analyses link migration flows to more general indicators of the well-being of the population more than to purely economic aspects (UNDP 2009). These aspects are well described by the HDI (a weighted sum of GDP per capita, life expectancy at birth, expectation of education, average number of years of the school attended).

The possible regressorsselected for the models thus were:

1. D_{ij}: representing the distance between the two regions. This value has been one of the most problematic to determine since the UN subdivision into macro areas leads to very large surfaces, and therefore it leaves a certain degree of arbitrariness in establishing the coordinates of each region to be used to calculate the various distances. In the end, we used the direct distance in kilometers between the centers of gravity of two regions.

2. GDP_iandGDP_j: indicate, for origin and destination respectively, the gross domestic product per capita. The data come from the World Bank database and refer to 2015 (World Bank 2017).
3. AGE_i and AGE_j: indicate the average age of the population in the origin and in the destination areas. They refer to 2014 (UNDP 2014)
4. $LifeExp_i$ and $LifeExp_j$: represent life expectancy at birth in the areas of origin and destination, and refer again to 2014 (UNDP 2014). The indicator is defined as the number of years that a newborn can expect to live, if the prevailing patterns of mortality at specific ages at time of birth remain constant throughout the child's life.
5. $SchoolExp_i$ and $SchoolExp_j$: are the expected years of schooling. They represent the number of years of teaching expected for a child entering the educational age (UNDP 2014)
6. $SchoolMean_i$ and $SchoolMean_j$: are the mean years of schooling.They indicate the average school year that a person aged 25 or more has attended during his life (UNDP 2014).
7. $INEQ_i$ and $INEQ_j$: represent the inequality indices within each region (UN 2014).
8. EMP_i and EMP_j: are the employment rates for the population over 15, calculated in 2013 (UNDP 2014)
9. *border*: this factor indicates whether two regions have a common border. It assumesa value of 1 in case the two areas are adjacent, zero if they are not. It stresses the geographical factors: two areas may be relatively close, but for instance separated by a sea or by another area, which represent some of the intervening obstacles pointed out by Lee.

Since all the indicators were reported, in the respective data sets, to the individual states, they have been weighted by the country populations to obtain valuesassociated to the macro areas.

Complete models

The results obtained by using all the independent variables listed above are relatively good: the corrected R-square values (that take into account the number of independent variables used) are 0.61 and 0.54 respectively for the model of 2015 resident and of the 2010-15 flows. This is an acceptable result for social science models, indicating that between 50 and 60% of the variability of the dependent variable is indeed explained by the models. Both models show, additionally, the importance of the distance factor, of the GDP in the destination area and of expected schooling in the origin area. Their

respective parameters are relative large in absolute values (they are negative, as expected, for the distance) and have a high level of significance (as shown by their p-value).

The two models are not fully satisfactory since several parameters have a low significance level. This is possibly due to the fact that most of the input variables are correlated between each other and this suggests adopting a pruning procedure to determine the most important factors in a different way.

Determining the most significant variables

The pruning procedure works as follows: the parameter estimation of the regression is repeated several times (exactly 13 times), each time excluding the input variable that has the least significant parameter. This means that we start with a model with 16 input variables and we go down to a model that has only 4. Clearly, we lose something in terms of model performances, but hopefully gain in model robustness. One can also think to the possibility of further reducing the number of input variables, but, when doing so, the model performance drop down to an unacceptable level.

Following the reduction paths, one sees that the first variables to be excluded are those related to the age and inequality in the origin country and that, at the end of the procedure, the remaining variables are always the common border, the distance, the GDP per capita of the destination and the expected schooling of the origin region. For all the four variables, the parameters are remarkably constant throughout the pruning procedure, their final significance is very high, and they remain in both the 2015 and the 201-15 flow models. The overall loss of model performance, as measured by the adjusted R-square value goes down from 0.61 to 0.57 for the 2015 modeland from 0.54 to 0.52 for the 2010-15 flow model. The obtained four variables models are however not only much more robust, but also easier to interpret and understand: they have two geographical, one economic, and one social input, with coefficients that (except for the border which is a binary variable) have more or less the same weight (in absolute terms, since the parameter of the distance is always negative).

Discussion of model results

The results of the gravitational modelspresented above are similar to those in the literature. The GDP of the destination country has been almost always considered much more significant than the GDP of the country of origin (Mayda 2010, Claydon 2012). This is justified by some (Letouzé et al. 2009, UNDP 2009) by the U-inverse relationship that exists between GDP in the country of origin and the rate of

emigration. These reports stress that the poorest and least developed are very often those with the least chance of moving (a certain level of income and education is necessary to be able to migrate), as well asthose that have reached a satisfactory standard of life. Figure 4 that reports the probability of emigration in relation to the per capita salary in the Mexican families is an example of this trend (Meza and Pederzini 2006).Given the simplicity of the gravitational model, which can describes only linear or exponential links with respect to the variables at stake, the factors that have more complex relations with the rate of emigration, such as that of GDP in the country of origin, may appear less significant in the model.

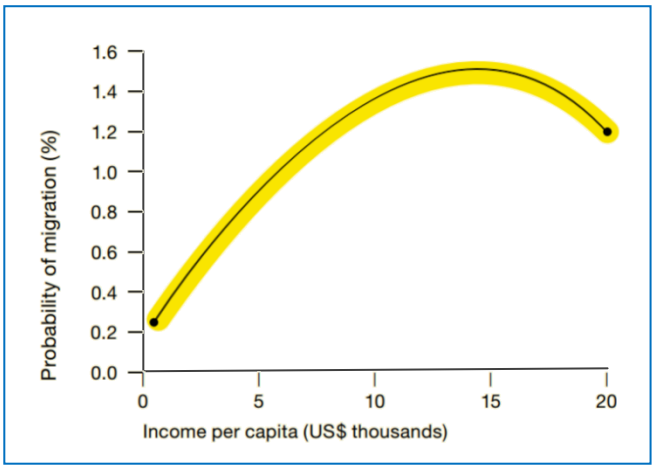

Figure 4– Probability of emigration by income level in Mexican households (Source: Meza and Pederzini 2006)

The strong significance of the distance factor in the regressions carried out and its negative value confirmsthat the increase in the distance between two macro areas leads to a decrease in the number of migrants, as already pointed out by a number of previous studies (Mayda 2010, Letouzé et al. 2009, Claydon 2012).Together with the distance, also the border factoralways remains among the four most significant indicators confirming how much the spatial - geographical aspect, which in part represents the similarity between two areas, is important in the study of migrations.

The last parameter that we find in the final model is that concerning the expectation of education in the area of origin (see also Meza and Pederzini 2009, Rao 2010, Postiglione 2017)which, together with the GDP, constitutesone of the component of theHDI as computed by the United Nations. The factor of education is often cited in the literature to highlight the phenomenon of "migrant selectivity".

According to this concept, the most educated and the most qualified people are those that have the greatest chance to migrate. Immigration policies in fact often favor the arrival of educated people with respect to those with less qualification (UNDP 2009).

Conclusions

The main limitation of the models presented here derives from the subdivision of the World into macro areas. This implies different consequences.

The modelassumes uniformity within areas, where important (political, religious, ethnic, linguistic) differences may be present in the different countries, specifically to allow and/or discourage population movements.Also the data on the distances between macro areas constitute a strong approximation since they do not well represent the physical barriers and the difficulties in moving between macro areas.

Additionally, the model is clearly not able to consider all the personal choices, the traditions, the past history (for instance, the presence of member of the same family/group already abroad). These are in fact almost never quantifiable.

The analysis does not take into account important events that very often cause movements of large numbers of people. These include natural catastrophes or wars. Instead, we focus on indicators that are fairly stable and predictable over time, easily quantifiable at a macro level.

The model does not consider the time variations, but is based only on data related to a given period. To prove its robustness, it would instead be necessary to analyze different data time series. However, it is almost certain, that, at a global scale, migration is not a stationary phenomenon and thus cannot be represented by a fixed set of parameters. Robustness must thus be interpreted as the fact that the most relevant factors remain the same though time, even if their relevance and representativeness change.

The modeldoes not consider the non-linear trends, like the U-inverse trend previously illustrated, and tends to give greater importance to factors with linear or exponential relations.

The strongest evident limitation of the model is that it considers only flows between macroareas and does not take into account the movements within regions and within countries, which constitute the largest portion of migrants. Indeed, in very low development zones, peoplehave the greatest difficulty in moving and traveling over long distances.

The current analysis, despite all these limitations, produced satisfactory results with numerous similarities with thosepresent in the literature concerning different periods and scales. It can thus be considered a good contribution for carrying out more complex elaborations such as the introduction of other variables or some adaptation of the gravitational equation aimed at capturing the non-linear trends that some factors present.

Though aware that the result of this work cannot be used as a forecasting toolnor for causal explanation, we can still consider it as a possible supporting approach in this field of study. In fact, the paper shows how complex the phenomenon of migrations is and underlines the need for an approach that does not limit itself to studying this complex topic from a purely socio-demographic point of view. The need to develop reliable and precise tools to analyze migration is more important today than ever and it is vital that this development be carried forward also in formal quantitative terms. Such models could in fact be extremely useful in addressing and supporting appropriate political choices in a world and in a historical moment in which migrations assume an ever greater and central importance within world societies.

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SESSIONI SPECIALI

PROFESSIONAL CHANGES AND NEW CHALLENGES IN THE FIELD OF INTERNATIONAL AID. THE CASE OF A PROFESSIONAL MASTER ON EDUCATIONAL INCLUSION[1]

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Abstract

The international scenario seems today characterized by an increasingly level of tensions and widespread conflicts, some of which have taken the shape of real humanitarian emergencies, especially the war in Syria, among the worst in the last decades.
Global political change and cultural transformations across the world occur at many levels.
On the one hand, national borders and social boundaries are increasingly blurred and constantly (re)drawn as result of the civil wars and massive migration flows. To this regard, the increase in the number of asylum-seekers in EU Member States over the past two decades has became deeply connected with the rise of exclusionary forms of ethnocentrism and populism.
On the other hand, the terrorist movements and the political instability in both the Middle East and African countries have made more difficult for vulnerable people achieve inclusion and peace. Growing forms of inequality, generated by a globalization process, have often neglected a fragile balance between the local and global processes, especially in the poorest countries, informing the conservative trends of many Western democracies.
The global changing scenario have forced the humanitarian and aid organizations to frame new agendas and re-think the traditional approaches in pursuing stability and promoting inclusion around the world. Indeed, there is an urgent need for professional changes in the way the international community face humanitarian crisis and violations of human rights.
Engaged with this issue, Italy finds itself in the strategic position to overcome the inadequacy of European responses to the making of development policies as well as solutions facing the growing arrival of refugees and migrants crossing the European borders. To this regard, the new Italian Law 125/2014 can be seen as part of a broader international policy, which resists and contrasts the new populism that animates Europe, supporting inclusive policies.
The Italian Agency for Development Cooperation, even if still processing its model, finds a crucial opportunity to build a renewed approach of cooperation where the Italian universities, among the other institutions, can make their contribution in the field of development and humanitarian aid, opening the "Third Mission" to a development-oriented international effort, as the United Nations Agenda 2030 states.
The University of Bologna 2016-2018 Strategic Plan has included the international cooperation actions under the Third Mission, placing them within the Goal 17 of Agenda 2030, that is to

[1] Notwithstanding that the contribution is the result of an observation and shared preparation process, we must note that the conclusions were looked after both authors while paragraphs 2, 4, 4.2 were written by Arianna Taddei and paragraphs 1, 3 and 4.1 were written by Federica Tarabusi.

strengthen “the means of implementation” and renew the global partnership for sustainable development.
In order to achieve these goals, the Department of Education Sciences aims both to become increasingly involved in the internationalcooperation projects(such as, Latin America, Africa and the Middle East) and to promote the training activities addressed to the experts engaging with the educational issues.
Within this background, the paper aims to introduce the training experience of a new Professional Master – which was planned thanks to a past successful experience - in order to discuss the new challenges that these professionals have to face in the changing global scenario.
If, on the one hand, the educational dimension includes a wider social function, becoming strategic to all the actions aimed at pursuing human development, on the other hand, the interweaving of the above-mentioned processes makes more difficult the negotiation of shared meanings to which the professionals refer to practice in the field. Among the other, we can observe the difficulty to link emergency humanitarian action to a more organic frame of development interventions. In socio-educational sector, in particular, this tension between emergency and development could fall into naive *assistentialism***,** “paternalistic” attitudes, or takes the shape of an explicit or implicit “cultural colonialism” informing the international interventions.
Within this frame, the Professional Master "International Cooperation and educational inclusion: new professional challenges” will address its effort in training new professional profiles engaged with the humanitarian aid and international development fields as well as a wide range of multicultural reception policies (at the local and national level) towards migrants, children of foreign origins, refugees and asylum seekers.
For this reason, the Department has decided to link the training experience to a research activities aimed at explore more in depth the skills and methodologies addressed to such specific professional profile.
Complementing the Master, the empirical research will aim, firstly, to collect interviews with some privilege witnesses. In particular, people involved will be practitioners, experts, project managers from non-governmental organizations, international organizations multilateral and bilateral agencies, non-profit associations, social cooperatives, local or national agencies committed to contrast socio-educational marginality as well as to the governance of migration and forced migration.
Moreover, the research will also be a way to monitor the developing of the Professional Master, showing lights and shadows of this post-graduate experiences.
Finally, it will understand if and how the training activities, and their inter-disciplinary background on the topic pf educational inclusion - from pedagogical issues to socio-anthropological knowledges - are in line with the complexity of the contexts where the students shall work in the future.
Thanks to the contribution of the main Italian institutional actors, such as the Ministry of Foreign Affairs and the AICS, both the research and the Master can be seen as a significant arena to strengthen the synergy between the practical and the theoretical-political dimension of the international cooperation, providing to the universities a leading role in training new professionals in such field.
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Introduction

Today, the international scenario seems to be characterised by crucial political and cultural changes, as well as increasing levels of tension and conflicts that seem to take form in actual humanitarian emergencies.

This scenario suggests to different types of organisations that operate in the fields of both humanitarian and development aid not only to re-consider traditional agendas and approaches, but also seek professional and competences that are ever more capable of interpreting political and contemporary social phenomena while creating planning skills in line with changes of the aid contexts.

By including international development aid in the Third Mission, the strategic plan of the University of Bologna (2016-2018) offers a major scenario that is significant in the preparation of innovative proposals that can help prepare new professionals to work in very complex contexts.

The article discusses the role of universities in taking on these challenges while contributing in the training of professionals committed to development aid work both in Italy and abroad. In particular, much emphasis is put on the professional Master proposal "International Cooperation and Educational Inclusion: New Professional Challenges", promoted by the Department of Educational Studies of the University of Bologna, aimed at training experts in the field of social and educational inclusion. In this context, the Master embraces different potential professional and work contexts that range from development policies, humanitarian aid and international cooperation in a multi-cultural setting and hospitality policies aimed at minors and vulnerable persons nationwide.

The last goal of the contribution is to consider qualitative social research as a decisive instrument to build in a procedural and contextual manner sustainability and effectiveness of the educational proposal. To that end, it was decided to accompany the educational course with a brief empirical survey aimed at reconstructing the perspective and positions of certain privileged participants who work in major professional and institutional contexts of reference (such as NGOs, humanitarian aid organisations, development agencies, social private services).

The considerations deriving in terms of critical points and strengths of the projects and social-educational interventions and professional competencies will therefore allow the gathering of major elements not only in the analysis of new professional figures required in aid contexts, but also in the preparation of educational courses from a top-down system to ensure consistency between needs expressed by the territory and agencies committed to social & educational inclusion.

The university and international cooperation

Today, international cooperation in its founding documentation[2] proves to have reached a high level of cultural and political maturity: it no longer shifts within the colonialist boundaries that at times have accompanied its initial actions and recognises as central point, concepts of dignity, ownership and local empowerment that contribute to guarantee a true cooperation. Based on this theoretical conquest, at a historical level, the cooperation is based on a framework full of contradictions, already declared internationally. Adversely, its works shift into a context that continues to be inspired by neo-liberalist logics, ruled by technical & economic approaches filled with dominant cultures and economies. In this context, logics in the cooperation for development aid struggle to take root and be recognised in state budgets. Still adversely, the rise of populist commotion in nearly all nations (aimed at defending the identities and local privileges at any costs, deaf in the fact of needs for intercultural dialogue and social and economic justice issues) led many to form an international cooperation as welfare intervention, aimed not at resolving issues, but simply at mitigating the consequences. Positively speaking, awareness is growing on the fact that the radical assumption of an international cooperation perspective capable of strictly follow the local development phases can prevent a future characterised by imbalance, conflict and ultimately war.

In this context, the university cooperation undergoes the same conflicts. Its development in the past years was based on an inter-university cooperation primarily directed at favouring scientific development. The logics of said development inevitably risk rewarding alliances among strong branches, the affirmation of a dominating culture in international rakings, the obtainment of maximum profit from cooperating activities. In this perspective, universities risk shifting towards

[2] See, among the others: OECD (2011), *Survey on Monitoring the Paris Declaration*, (available online: http://www.oecd.org/document/1/0,3746,en_2649_3236398_48725569_1_1_1_1,00.html – Paris; OECD (2008), *Declaration and Accra Agenda for Action* (available online: http://www.oecd.org/document/19/0,3746,en_2649_3236398_43554003_1_1_1_1,00.html - http://www.aideffectiveness.org/busanhlf4/); ONU (2015), Agenda 2030, (available online: http://www.un.org/sustainabledevelopment/development-agenda/).

being subject to evaluation processes that link their economic survival to immediate results measured pursuant to guidelines that exclusively follow disciplinary logics and hence insufficiently related to actual needs of the cooperation for development. For example, the manual for the assessment of the third mission of Italian universities adopted by ANVUR in February 2015 particularly identifies eight categories to be evaluated, including public engagement actions (ANVUR, 2015). It is no coincidence that any reference to international cooperation is omitted within these categories, even based on the reasoning that the relapse of the university's projects on the territory is normally identified in the immediate surrounding territories. Not necessary against the inter-university cooperating methods quoted so far, but at this point we must emphasize the parallel reasons of a cooperation intervention that can involve the universities in development aid projects not only focused on mere scientific research, but also aimed at favouring the dissemination of know-how and construction in individual areas in the ability to produce knowledge independently by carefully recognising local needs. Involvement by universities to cooperation projects for development must necessarily need to deal with the opportunity to build alliances not only with other universities, but also with institutions and speakers of the civil society in Italy and abroad; in particular, with the system of the participants who are capable of planning and acting locally over a long period of time and continuative within the scope of a perspective to integrate scientific competencies with economic, political and local cultural competencies. With this in mind, the opportunity for universities to obtain direct loans from AICS seem of great importance as envisaged in article 24 of Law 125/2014 and at the same time a need is evident for said possibility not to be used to load universities with tasks and duties that can be recognised to other subjects of the cooperation, including for example NGOs.

Even if still defining its own model, the Italian Agency for Cooperation for Development is an essential opportunity to create a renewed approach for cooperation where different institution entities and others, including Italian universities, may have the opportunity to provide their own specific contribution. This in particular to qualify the cooperation interventions and at the same time open the third university mission to internationalization aimed at development in the direction laid down by the Agenda 2030 of the United Nations.

The University of Bologna included specific goals to strengthen international cooperation in its strategic plan 2016-2018 within the scope of the third mission while placing them within the objective 17 of the Agenda 2030 "Strengthen Implementation Resources and Renovate the Global

Partnership for Sustainable Development". Taking on responsibility in training practitioners who are involved in international cooperation projects is included within the scope of this objective. Said responsibility must concern not only professional training of those who intend to participate to development aid projects internationally. In fact, in reality the creation of academic competencies must also be required for those who working on cooperation projects set out and managed in Italy. It is evident that the general situation in our country finds internationalisation not only in the willingness to take action in remote regions, but also in every place where there is tension and conflict between different cultures, residents and migrants, including parts of societies with needs and motivations that are rival between them. What are the professional competences required for those who intend to take part in the cooperation for development in Italy and abroad?

The Master: challenges and proposals

Within the scope of the above framework, the Department of Educational Studies intends to pursue the objectives of the strategic plan of the University of Bologna by strengthening its own presence in international cooperation projects (in Latin America, Africa and the Middle East) as well as by investing on training for the aid practitioner working in the field of social educational inclusion.

In this respect, a proposal of a professional Master was recently formulated which is rooted on a training course that in the past was successfully focused on educational cooperation. Despite being positioned within a continuity process with past experience, the new proposal of the Master, entitled "Cooperation and Educational Inclusion: New Professional Challenges" was drafted based on local and global transformations that have recently involved the aid contexts. From an interdisciplinary perspective, the professional Master is intended as a concrete and proper answer to "educational challenges" in development aid and international cooperation, as well as changes that characterise contemporary scenarios: from the pressing migrant waves to new political and social "emergencies", from widespread forms of instability and conflict to increasing inequality caused by cultural, ethnic, social and gender diversity. By targeting graduates with different backgrounds, the masters is aimed at developing professional skills for involvement in the humanitarian aid and development field, as well as in providing local and national answers that the hospitality system intends to provide to minors, migrants, refugees, asylum seekers and other vulnerable people. For these reasons, we propose investing in the training of future cooperating people, professionals in the

development and humanitarian aid fields with specific competences in educational inclusion, as well as experts who work in different agencies and organisations responsible for dealing with hardships and marginality or in the field of migration and forced migration.

If, on the hand, the educational dimension assumes a more broader social function by becoming strategic and transversal for all types of interventions that propose the promotion of human development, from the other hand, experiences are multiplied, as well as researches that put educational inclusion in the central point of aid policies and cooperation interventions made nationally and internationally (Tarabusi, 2008; Taddei 2017).

In spite of this, we know there are signals and critical issues in the field that suggest the importance of investing more on training those involved in projects and social & educational processes.

First of all, the above changes and dynamics make the implementation of negotiation and construction processes of shared meanings by those working on the field even more complex and emphasize the need to link the emergency humanitarian action with decisions and systematic interventions for development aid.

Secondly, it seems necessary to overcome the classical logics of traditional cooperation based on the so-called "top-down approaches" and on paradigms of positivist imprint that have not seldom interpreted social phenomena through a strict causal determinism (Stirrat, 2000) and produce imperialist practices and neocolonial logics over time (Escobar 1991).As previously mentioned, even affirmation of a scene of new political models does not seem to have cleared development processes from the emergence of new "populisms" (Olivier de Sardan, 1995) that translate into aid practices detached from social contexts and concrete needs of local populations. To that end, plenty of literature on the international field has outlined how even behind bottom-up participation approaches, welfare and paternalist logics can be hidden that more or less consciously encourage dependency while reproducing asymmetry and obstructing the establishment of processes towards self-determination of vulnerable people and groups (Gardner and Lewis 1996; Zanotelli andLenzi-Grillini, 2008).

Last but not least, the abilities and expertise of practitioners, who find themselves dealing with more variable complexities, can favour or compromise the success and the sustainability of the interventions. For this purpose, some experiences suggest the need to have a greater impact in the preparation of professionals who work in the educational field by enhancing the social &

educational contents and theoretical interdisciplinary knowledge, as well as critical methodological instruments aimed at understanding cooperation contexts and new political and cultural phenomena. When considering this scenario, the educational proposal of the professional Master extends around the core of competencies that are put as possible answers to several of these critical situations. From one part by providing and consolidating the training of future professionals on theoretical know-how and interdisciplinary approaches needed to operate in contexts and processes directed at educational inclusion and on the other by stimulating and emphasizing opportunities for discussion and learning that help convert theoretical aspects (educational, technical, legal and socio-anthropological) into project solutions to deal with concrete challenges posed by the current society and international communities.

Research: voices and insights by participants on the field

The quality research process being presented is currently undergoing an assessment phase to come up with a first overview, even if not exhaustive, of the current professional context on the cooperation to which the master intends to contribute through the training of competent operators for both theoretical and technical knowledge on which to develop the professional profile of the aid practitioner.

The contents provided hereafter were subject to observations and analysis based on the interviews conducted to six privileged witnesses, representatives of the international cooperation and hospitality sector in Italy. The interview was conducted following a semi-structure method by leaving the possibility to researchers to discuss along with those being interviewed several major subjects based on the institutional role, professional interests and competencies of the participant. The agenda was based on three main themes of questions regarding:

- the major changes that characterised the context of the international cooperation or hospitality in Italy in the past ten years;
- the main competences to work within the scope of the cooperation with a view focused on study courses or past professional experiences capable of ensuring more than others a profile of competences appropriate for new challenges posed by the national and international scenario of cooperation, in particular the social & educational sector;

- the factors that can contribute to the realisation of a quality cooperation intervention while being aware that the subject is very complex, object of a broad and current discussion that cannot be answered at this stage.

The analysis of the interviews gathered will be presented on two levels: the first one intends to offer a macro consideration on the above mentioned main topics while emphasising the strengths and critical factors of the current scenario in the cooperation and competencies requested to operators in Italy and abroad; the second level of analysis discuss the topic on competences even further regarding those involved in the field of aid cooperation, particularly in the educational sector of the Central American region. This is also interesting because the Department of Educational Studies of the University of Bologna in the past ten years constantly intervened in the area by developing a major university cooperation experience in development aid policies.

New scenarios, new professionalism: first reports from the field

When talking with the first privileged witnesses it seems clear that the changes of aid contexts and global scenarios, as described above, are deeply perceived by those who work in the field.

As outlined by the director of an Italian NGO, for international cooperation, for example, the entry on a scene of new players that are not traditionally included among the "technicians" of development aid seem more evident. Universities, entities and research institutions stand out among these thanks to Law 125/2014 by making available expertise, material and professional resources while contributing to lessening a certain (only in part physiological) dose of uncertainty and ambiguity in planning, implementing and evaluating the interventions.

On the other side, the inclusion of other subjects that are part of the profit sector, such as businesses, make creating and negotiating shared goals are even more complex for those who work by following participatory development aid logics of empowerment and community. Besides rhetorical aspects of the partnership it seems clear that the different agencies and professionals for development aid, as well as the multiple key players who operate in the uneven, diversified system of hospitality in Italy may not always count on converging interests, approaches and actions that develop within a common territory. In the words of one of our participants, it seems evident that the "challenge today (is) to put together goals among key players who are so different".

With these considerations we gradually draw away from an abstract, romantic aid and cooperation vision by been more aware of the market logics and competition, asymmetries of powers and logics

marked by conflict between different key players that may influence the cooperation interventions and own daily tasks:

> "In my opinion a project manager today cannot be aware of how power hierarchies can have an effect on aid relations....logics of control that regulate dealings with the donor, partners, etc must be known. A rhetorical vision of cooperation and a too romantic version of cooperating work seem not to be in line with reality.... because then you clash with another world... made of own rules and competition"
> (Directors of an Italian NGO)

It is interesting to note how the narrations of those interviewed approach critical considerations of experts that in the literature of international development aid have disputed reified and monolithic visions of aid projects (Olivier de Sardan, 2008; Mosse, 2004; Tarabusi, 2008). How in said studies, the intervention aid is in fact understood by those operating in the field as a social and political reality where multiple representation systems intersect where groups and organisations interact, negotiate resources, meanings and diverging interests within an area forged by multiple power asymmetries.

The approach to an aid relationship with empowerment logic is framed by many interviewees within this complex network of social and institutional key players as one of the factors that is significantly capable of having an impact on the sustainability of the intervention. In this respect, a social operator who works in the hospitality field in Italy has outlined among the strengths of the implemented projects the ability to produce and use "the network", it being understood as a series of relations and actions that are created thanks to the variety of key players in the territory who mobilise and interface to take action on specific cases or interventions. The ability to produce a major change for the user, capable of not reproducing asymmetries and dependence, but rather implementing its independence and self-determination, seems highly correlated to resources and potential that are put into effect in this network.

Likewise, for those working in aid cooperation abroad, the layout of partnership relations is the first card to play in order to prevent difficulties in the implementation of an intervention and hence have an effect on sustainability. In both cases, the construction of certain working settings for group

discussion are considered significant to develop the practitioner's professional reflexivity, intended as critical ability to question own work practices (can be about discussions that are produced during local encounters in international projects or within a territorial team for the supervision of a case).
According to a person interviewed, another major dimension is represented by social innovation, namely the possibility that the international cooperation - understood not as transfer of models, but as co-planned development aid - can be capable of setting off those challenges in "beneficiary" countries that can be depicted as more innovative in their own contents or origin (for example, in terms of educational methods, educational orientations, etc).
Lastly but not least, specially for the non-government sector, the topic of advocacy is ever more important, understood as the capacity to promote a political process aimed at having an impact on educational policies, the distribution of material and symbolic resources within political, economic and social systems of specific local contexts. It is diriment from this point of view to overcome a welfare approach that can qualify the aid cooperation as mere disposition of services capable of producing an instant change, but very insignificant over a long period, to mobilise broader material and symbolic resources that can engage effective transformation processes with a broader range.
If from side, empowerment, the ability to make networks and advocacy seemed as major innovative drives for a projecting action and from the other side, the effectiveness of an intervention cannot be disconnected from professionalism and preparation of individual operators who are found in the field. In fact, participants have reasserted how the implementation and realisation practices of interventions require strong expertise and professionalism, in addition to subjective skills and new abilities that can move us once again away from a romantic and abstract vision of "making aid cooperation".
For those working on the humanitarian field in Italy and those involved in development aid cooperation abroad it is not easy to set limits and hierarchize a wide range of competences, know-how, abilities that are equally crucial for professionals in the field. A hospitality operator explains:

> "To a certain extent, we need a little eclecticism.. not in the sense of being all-round experts, but in the sense of not having to be.....let's say, well prepared on legal and regulatory aspects and not know anything about education and cultural aspects ... or have absolutely no idea about the managerial-administrative plan... we need for that practitioner to clearly know what are laws in order to first of all

> understand the legal conditions of a migrant and minor, but also to have strong knowledge on social and educational processes.. one who knows how to understand the phenomena, but also know what is a budget..."
> (hospitality operator in Italy)

Even those working in cooperation abroad reassert how important is been able to count on a "versatile" professional capable of dealing with different matters. Just as the case of cooperation in Italy, empathetic and interpersonal abilities result from a factor that can make a difference, despite depending on the subjectivity of the operator rather than his/her experience or academic background.

The managerial competencies of a practitioner were however particularly stressed for development aid cooperation abroad. In addition to knowing how to devise and write by "actively listening" and reading the aid context, it seems crucial to know how to "manage", learn how the transfer of resources work, as well as the management of a project. As stated by an interviewed person:

> "If operators did not work the season or worked in the profit sector, they have no idea how to manage financing. The educational contents are important but great part of the project is also made up of accounts, contracts, negotiations, budgets, etc."
> (foreign desk-officer)

Lastly, in the contemporary context, we can see how crucial the ability to document, file and communication can be, namely what is done in the field. To that end, more participants have asserted how the management of social networks and competences on new technologies produce an added value for visibility, networking and hence sustainability and effectiveness of an intervention. This in fact, in a certain sense allows us to overcome the isolation and fragmentation of individual projects so that own actions can be perceived and distinguished for external key persons and work in synergy with other contexts and interventions.

Voices and perspectives of international aid cooperation

Participants listening have been committed over time to cooperation in the social and educational field in Central America. Each interviewed practitioner has a technical professional profile curved based on experience in the sector, as well as own personal traits. A.M. offers a political reading thanks to its twenty year experience with the Ministry of Salvadorian Education on inclusive policies. M.M. expresses an expert point of view in various public and private institutions in the protection of rights of Disable People Organisations, a woman with disabilities; E.M. is the representative country of an Italian NGO actively engaged in the social & educational sector. The interviews have helped emphasise the strengths and critical conditions of different types of competencies on which to build a profile for the professionals in the field of development aid cooperation while highlighting the potential contribution of academic institutions in the training of said competences and the qualification of the cooperation intervention.

Theoretical competences and reading techniques, analysis of contexts and understanding of needs:

According to Central American participants, the reading competences, analysis of contexts and understanding of needs to be qualified require a methodological approach based on research of sociologic and anthropologic nature that allows for a clear outlook of feasibility conditions at the base of interventions, conditions of which concern social, cultural and political aspects, all fundamental in social and educational programmes. In fact, one of the participants outlined that:

> "one of the areas that has been neglected historically in international cooperation interventions was research which can give sustainability to initiatives (...) The realisation of projects must try to seek strategic alliances from the start with universities so that we can continue to do research in parallel to the realisation of the project in order to define criteria, variability and set the limits where to make real difference".

According to the E.M. coordinator of the Italian NGO, an approach for research requires the ability to identify and enhance resources present in the contexts. From a strategic standpoint of those working in the field, this means to integrate the aid cooperation intervention with the work of local

organisations especially where, like for example in Central America, there is a civil society characterised by a complex, capable organisation. The competence of the aid practitioners becomes that of knowing how to act in the territories by valuing what is happening while facilitating exchange of experiences and methodologies and creating connections between countries.
As for research, the contribution of national and international academic institutions is certainly significant even in terms of alliances between universities of the north and south of the world. A.M. outlines the complementarily of the respective contributions:

> "for example, if an alliance is created between a Salvadorian university and a European university to help the Salvadorian government structure educational proposals, the role of the Salvadorian university would be to guarantee the contextualisation process of the proposal with respect to actual needs and know-how already produced locally while the university of the north could contribute especially in terms of a methodological and theoretical framework with which to understand the needs and prepare a proposal".

The practice of understanding needs in the field was adopted for ten years by partner countries and one of the participants (A.M) emphasizes that the international cooperation should not support this "bad practice", in fact: "If research concerns of the main duties of universities, the national and international universities must be responsible for analysing the needs of the territory before preparing and implementing cooperation projects".
In the reading and respective understanding of contexts, all witnesses agree on the fact that sociological and anthropological competences are required even to be able to read and understand the nature of social, cultural and economic differences linked to micro-areas within the same country (Carrino, 2015).One of the interviewed parties (A.M) stated that within the scope of education, we can have persons trained on curricular planning who have good proposals which however do not create in-depth transformations as they are often free from social and cultural factors in the educational context.One error that is highly diffused from a political standpoint according to the participants is to believe that an educational project can be generalised nationwide without considering territorial differences. In particular, the Central American witnesses reassert that "no matter how small a country or region can be, there are major contextual differences.

Unfortunately, the sameaid cooperation still tends to generalise developmentaid interventions and practices in an indiscriminative manner without properly accounting for contextual differences".

Technical competences for planning, realisation, monitoring and assessing interventions

The planning, realisation, monitoring and assessment phases of cooperation interventions require overall specific competences developed on two dimensions: one technical and one political. With respect to the first one, the representative of the E.M. Italian NGO emphasizes the importance of being constantly up to date on approaches and methodologies adopted internationally. As for the second one, the two Central American participants outline several risks. In fact, a phenomenon has occurred for many years (progressively decreased) concerning a cooperation created on projects pre-defined by donor countries where local key persons were mostly excluded from the devising process. This type of top-down approach was objectively strengthened by contextual factors as affirmed by one of the witnesses (A.M.), most public and private entities did not develop enough competences for the planning process. To that end, most of those interviewed suggest that a major contribution by universities could be to develop abilities with local universities to prepare projects and participation to international tenders for fund raising. The realisation of projects from a top-down system have often cause misunderstandings between donors and local participants with respect to the methodological approach from a political and cultural meaning of the intervention adopted, in fact A.M. explains that:

> "we live in a context with very high acts of violence and therefore projects tackle prevention of violence. 25 million dollars for violence prevention. What does it mean to prevent violence from another country's point of view that does not experience this problem? For example, for an American? For an Italian? For a Central American... we often find ourselves at implementing projects that meet guidelines far off our reality with insufficient social consequences or even negative consequences..."

The participants stated that often approaches have been adopted as well as de-contextualised programmes that have not have any impact on social transformation processes where education certainly assumes a central role even in connection to for example violence prevention. One of the

participants (A.M) emphasized the concern that in schools often directors are not able to properly deal with teachers and this same difficulty in communication is encountered between political parties. We must develop competences for cultural and social mediation through training programmes and capacity building founded on education on peace and transversal actions to different social contexts (from schools to politics) in order to develop a complex vision of the reality capable of overcoming a perspective of a polarized analysis.

In order to develop a system approach that can tend to integrate existing services while strengthening policies in force, cooperating operators must have the planning and implementation requirements based on an inter-institutional approach, regardless of their specific role. The interviewees emphasize that too often, international cooperation tends to develop projects with the educational, health and employment sector in a completely separately manner without creating any connections that would entail alliances in terms of policies and optimisation of resources of different nature to achieve the goals that have a shared social impact. As outlined by A.M:

> "problems are not only in the educational or healthcare system, but they are also social so we must encourage dialogue and cooperate with local institutions. One of the efforts and one of the most important requirements of a cooperation intervention is to promote this synergy because we do not have experience in this area. We are used to planned by sector. The cooperating parties and their organisations come from countries where planning is not segmental. Why is it then that when they come into our countries they propose segmental planning?"

In terms of inclusive education policies, the approach to human rights should be adopted transversally to the planning of different types of actions. One of the interviewees (M.M.) highly claims the need to involve persons with disabilities in cooperating interventions from the preparation phase of the project proposals, as envisaged in article 32 of the Convention on rights of people with disabilities (ONU, 2006; Griffo & Al., 2015; MAECI, 2013)in order to guarantee the inclusion and involvement by everyone so that all stakeholders can have a clear understanding of their duties in the development processes.

More specifically on the realisation phase of the cooperation intervention from a technical point of view, the representative (E.M) of the Italian NGO emphasizes the importance of knowing how to

work in a team and remotely with participants from the branch in Italy which often adopts points of views and defines priorities that are not always in line with those of the responsible for the implementation of the project on the field: "One thing is to be able to work in the field while it is different to work remotely which implies being able to communicate good, know how to express yourself well and know how to write well. Moreover, the managerial and administrative competences are also certainly fundamental".

One of the processes that has assumed more importance over the years (remove comma) is without doubt monitoring and evaluating. In fact, E.M. affirms that:

> "In the current scenario on cooperation there is significant demand by donors not only to prove that what you are doing has an impact, but also that the methodology you are using is evidence based, that what you are doing works and hence I believe that the university has a major role in strengthening the work of NGOs and also the cooperating agencies with respect to all that has to do with the management of knowledge and monitoring. To future operators of the cooperation I would provide major training on monitoring, evaluation and preparation methodologies not only in theory, but I would also bring experts, role play and simulations".

For purposes of monitoring and evaluating, the documental activities assume strategic importance because it accompanies the processes and allows all involved stakeholders to reflect on the practice and at the same time share actions and methodologies. As clarified by one of the Central American witnesses "I do not refer to documentation of the intervention understood as a historical narration of the project, but as analysis and reflection on practices that have concretized the project". The topic of documentation is particularly significant in educational projects in Italy and abroad because it is a base for educational reflection, essential for the construction of individual and social learning and sharing of practices within a community of professionals. Lastly, as for as any differences on competences for the planning and realisation of emergency interventions with respect to development aid interventions, all witnesses agree on the fact that this boundary today is very faded with respect to several years ago. The emergency was historically linked to crises and required interventions of mid-short term. To that end, E.M., representative of the Italian NGOs, emphasized

the following: "The problem today is that there more ever more permanent crisis in the world and therefore we cannot work on the emergency without thinking about development and vice versa and it is ever more necessary to develop resilient abilities which means to work on structural causes that lead to the vulnerability of people".

Transversal competences

In view of the opinions gathered, transversal competences assume a significant meaning in the development aid practitioner's profile. Certainly having an academic title is required, but is not enough because an entire series of transversal abilities is needed which cannot always be taught and are often part of personal traits of individuals and other times they need to be cultivated and matured through experience. Among the most significant the following competences are outlined:

- interpersonal skills: empathy expressed through the ability to dialogue, coordinate human resources, work with excluded groups or in situations of serious social vulnerability. These are certainly fundamental competences for whose who intend to work in projects aimed at promoting educational and social inclusion.
- process skills: the interest and professional willingness to contribute to development courses of a country; the ability to explore and in part transform areas through an holistic approach that takes into account complex situations, it being understood as one of the main dimensions of cooperation interventions. As outlined by one of the interviewees, it is important for programmes to adopt a co-constructive approach through those who develop, an approach that is participatory and based on promotion and protection of human rights and that can be able to generate widespread awareness within the EU and on social transformations currently in course.
- managerial skills: the main ones concern the use of technologies, knowledge of languages in the contexts where he/she operates, management of data banks, especially for the implementation of monitoring and assessment actions, basic administrative and financial skills.

Conclusions

By including international aid cooperation in the Third Mission, the strategic plan of the University of Bologna (2016-2018) offers a major scenario to draft innovative educational proposals that propose the training of new professionals to work in contexts characterised by high complexity.
The article discusses the role of the university in taking on these challenges by contributing in the training of professional figures committed to the field of both humanitarian and development aid in Italy and abroad. In particular, it focuses on the professional Master proposal on "International Cooperation and Educational Inclusion: New Professional Challenges", promoted by the Department of Educational Studies of the University of Bologna, focused on the training of expert figures in social & educational inclusion. The new elements of this edition of the professional Master, supported by our experience in university cooperation are represented mainly by the following remarks:

- Overcome a bi-focal vision that has a dichotomous look of the training of aid professionals committed todevelopment aid cooperation in Italy and abroad.
- Adopt an interdisciplinary approach to training
- Put emphasis on a holistic vision of professional and transversal skills of the operator.

In a scenario characterised by significant political, social and institutional changes, it was decided to accompany the professional Master proposal with a quality research aimed at exploring the point of view of certain privileged participants who work in the field of educational cooperation in Italy and abroad (like NGOs, social private services and development aid agencies).
The initial phase of the survey confirms from one part the importance of striving for an versatile training that can put together technical, managerial, political and legal competences with interdisciplinary knowledge aimed at analysing inclusive and educational processes (with special emphasis on the educational and anthropological-social area).
On the other hand, those interviewed urged us to provide future practitioners with methodological instruments that are critical and crucial in understanding needs and local contexts in professional reflexivity on own working practices, in the interpretation of a range of multiple meanings, cultural visions, interests that can intersect in the political arena and in the construction of networks and partnerships.

Nevertheless, interpersonal skills and the ability to convert theoretical knowledge into concrete planning solutions seem strategical. In this respect, the active educational methodologies (supported by discussions in workshops and lab activities), as well as accompanying the trainee experience are considered factors that cannot be ignored in the high training university course.

Nevertheless, the interviews leave a voice of concern on the quality of aid cooperation processes that are related to the need to consolidate the leading role of institutions and local organisations and their training on competences functional to social and human development within an independent logic and sustainability based on principles of inclusion. Ultimately, the quality of the development aid cooperation interventions depend on many factors, among which without doubt, the quality of professional figures who coordinate specific programmes and define aid policies of individual cooperation agencies.

To conclude, the results of the interviews recognise the university a strategic role in supporting empowerment processes in institutions and in different persons of the civil society thereby strengthening the size of the university third mission; a mission that must enhance the social responsibility of academic institutions in training "competent citizens" to promote a major social transformation.

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SESSIONI SPECIALI

THE PROJECT RUSSADE (NETWORK OF SAHELIAN UNIVERSITIES FOR FOOD SECURITY AND ENVIRONMENTAL SUSTAINABILITY): THE ROLE OF UNIVERSITIES AS ENGINES OF DEVELOPMENT

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Abstract

The project Russade attempted to give a solution to the lack of skilled professionals in Sahelian countries employed in key structures to ensure food security and improve local productions in a sustainable and environmental respectful perspective.An active network has been established between four universities to improve knowledge and know-how and a new Master course on "Food Security and Environmental Sustainability" was implementedwith an interdisciplinary and multidisciplinary approach.The reinforced capacity of the institutions ensures the training of more competent professionals who can effectively participate in sustainable development emphasizing the links between learning, research and professional practice.

Il progetto Russadeha tentato di dare una soluzione alla mancanza di professionisti qualificati nei paesi saheliani impiegati in strutture chiave per garantire la sicurezza alimentare e migliorare le produzioni locali con una visione sostenibile e rispettosa dell'ambiente. È stata creata una rete attiva tra quattro università per migliorarne le competenze e un nuovo corso di Master su "Sicurezza alimentare e sostenibilità ambientale" è stato attivato con un approccio interdisciplinare e multidisciplinare. Il rafforzamento delle istituzioni garantisce la formazione di professionisti più competenti che possono partecipare efficacemente allo sviluppo sostenibile, sottolineando i collegamenti tra apprendimento, ricerca e pratica professionale.

Keywords

Sahel, Food Security, Environmental Sustainability, Interdisciplinarity

Introduction

The project Russade (Réseau des Universités Sahéliennes pour la Sécurité Alimentaire et la Durabilité Environnementale / Network of Sahelian Universities for Food Security and Environmental Sustainability - FED/2013/320-115) (http://www.russade.eu- www.cisao.unito.it)

was funded by the European Union in the ACP-UE Cooperation program in higher education Edulink II. The project was led by the University of Turin (Interdepartmental Centre of Research and Technical and Scientific Cooperation with Africa, Cisao), Italy, in partnership with the University Abdou Moumouni of Niamey – Faculty of Agronomy, Regional Centre for Specialized Education in Agriculture (Cresa), Niger, the Polytechnic University of Bobo Dioulasso - Laboratoire d'Études des Ressources Naturelles et des Sciences de l'Environnement (Lernse), Burkina Faso, and the National Institute of Sciences and Technologies of Abéché (Insta), Chad.

The main goal of this project was to improve knowledge and know-how of Sahelian Higher Education Institutions (HEIs) to fight hunger and poverty and assure food security. An active network has been established between the four involved universities, developing scientific, technical and didactic collaborations to increase attention and care for sustainable development and environmental safeguard. A new Master course (French Licence Master Doctorate – LMD system) on "Food Security and Environmental Sustainability" was offered to students in order to enhance different strategic topics: livestock and agricultural productions, food security and safety, environmental protection, sustainable management of natural resources, communication skills, projects management. Lessons were organized according to an interdisciplinary and multidisciplinary approach and teachers shared their experiences with colleagues from different countries. The delivered diplomas are internationally recognized in Africa.

To enhance the role of universities as engines of development, the project promoted teachers and students mobility, encouraged an interactive approach sharing their skills and delivered didactical programmes according to local needs and labour markets to face challenges of sustainable agriculture and environmental protection.

10 students (1 woman, 9 men) with different previous curricula were enrolled in the Master, organized in six months of lectures supported and supplemented by six months of internships dedicated to qualifying experiences carried out in the technical structures of ministries, training and research institutions, enterprises and NGOs of Niger, Burkina Faso, Chad and Togo.

Results and outcomes of the project and of the master were evaluated by internal monitoring and external evaluation. The reinforced capacity of the HEIs ensures the training of more competent professionals who can effectively participate in sustainable development and poverty reduction strategies in their countries. The evidence of this is given considering the working and recruitment situation of the graduates of the Master. All of them had a working progression in the same employer or new recruitment according to their acquired skills. The internships' institutions

managers confirmed the correspondence between the offered training and the needs of field expertise to administer locally projects and interventions on sustainable development.

Aims and actions of the project RUSSADE

One of the main elements of the project Russade, as well as the Edulink II program (http://www.acp-hestr.eu/edulink-about-contact), is the strengthening of academic collaboration at the international level, particularly South-South and North-South. In this context, the approach followed was to bring together the partner universitiesand to develop a common vision of priorities for the Sahelian areas concerning food security and environmental sustainability and to share a new educational approach (Semita *et al.*, 2013a; 2013b; 2014a).

Therefore the four centres of higher education developed an ambitious and innovative pilot program (Fig. 1), integrating their different visions and each giving a specific look at the priorities of their countries (http://www.un.org/sustainabledevelopment/fr /objectifs-de-developpement-durable/).

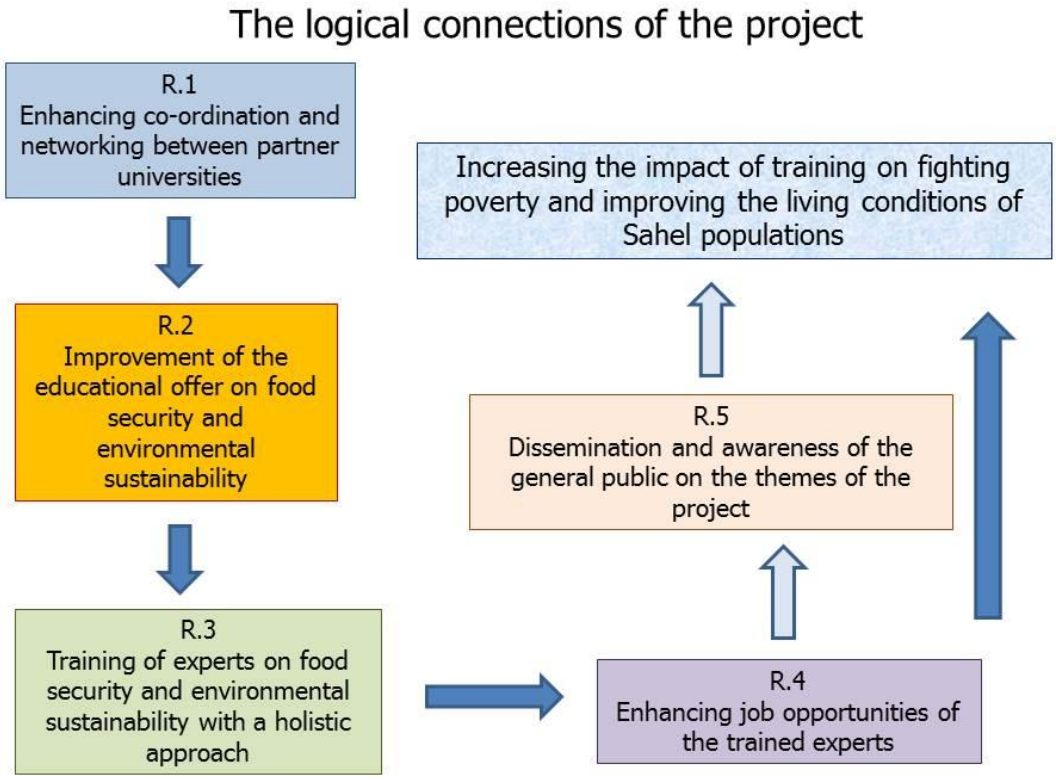


Figure 1 –Connection between the results of the project RUSSADE and the main goal (scheme of B. Mola, modified).

The project Russade proposed a new training program, a Master course, with a systemic and multidisciplinary approach, organized through an active network between the four partner universities. Thanks to the educational offer of the course, students' capacities were reinforced in the various strategic areas, such as livestock, agriculture, food security and environmental protection (Semita et al., 2014b), with the aim to enable them to face the challenges and constraints of rural development and to take into account the links between the different themes (Figures 2, 3 and 4).

Figure 2–Study visit to the centre for the improvement of energy production and use (Region of Tillabéri), by P. Barge

Figure 3 – Production of pellets from agricultural residues (Niamey), by P. Barge

Figure 4 - Practical courses to test the effectiveness of solar ovens and the possibility of reducing and contrasting deforestation, by P. Barge.

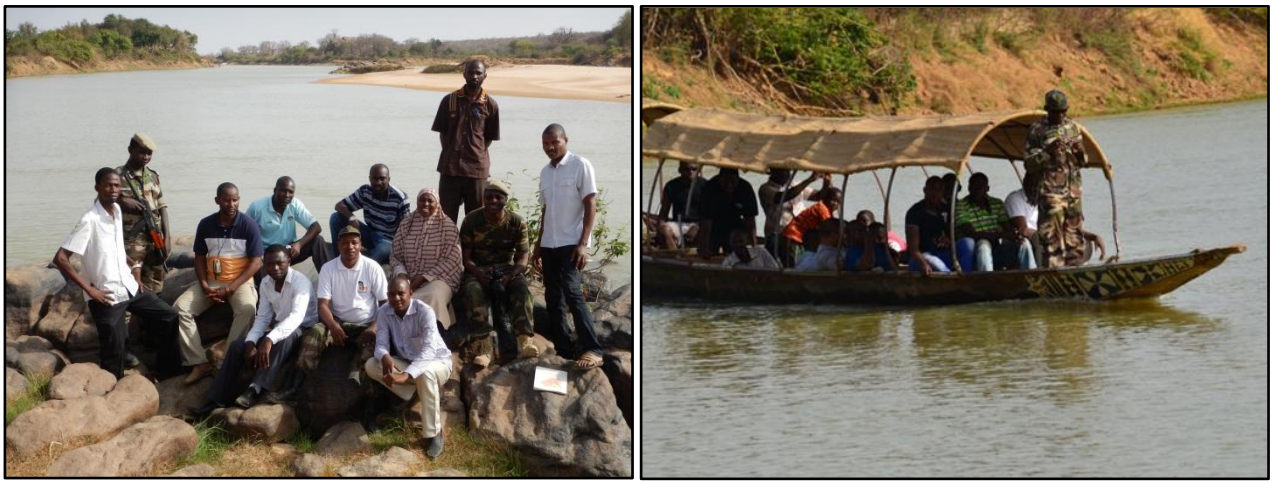
The first edition of this Master began in February 2015 in accordance with the calendar of the University of Niamey.

		Teaching Units	Teaching modules	Credits
Compulsory	Fundamental	**1**: **Livestock and crops productions**	**1.** Improvement of animal production systems	3
			2. Improvement of vegetal production systems	3
		2: **Land and natural resources management**	**3.** Land management	1
			4. Integrated management of soil fertility	1
			5.Waste management and recycling	1
			6.Water supply	1
			7.Using solar energies	1
		3: **Valorisation of agro-food products**	**8.**Conservation, processing and packaging	2
			9.Marketing	1
	Transversal	**4**: **Policies and development strategies**	**10.**Cooperation activities planning and management	3
		5:Biodiversity and biosecurity	**11.**Biosecurity	1
			12. Sustainable management of biodiversity and protected areas	2
		6: **Methods and communication tools**	**13.** Tools of communication and advocacy	2
			14. Outreach methods and tools	2
			15. Methods of collecting and analysing data (HEA and others)	1
		7: **Global and local aspects of food security and sustainable development**	**16.**Food security and sovereignty	1
			17. Environmental sustainability	1
	Workshops	**8**: **Workshops on food security and environmental sustainability**	Quality and Food Security	0
			Street foods in African cities	0
			Food security and Public Health	0
			Improving agriculture and rural sustainability	0
Optional		**9** : **Optional courses**	**18.** GIS and remote sensing	1
			19. WASH (Water, Sanitation and Hygiene)	1
			20. Using other renewable energies	1
			TOTAL CREDITS	**30**

Table 1 – Teaching modules in the Master "Food security and environmental sustainability"

The program, included in the didactic offer of the Faculty of Agronomy and the Regional Centre for Specialized Education in Agriculture (Cresa), has been recognized by the African and Malagasy Council for Higher Education (Cames). The issued diplomas are valid in all the countries of Africa. The training program consisted of 20teaching modules(Table 1) in a period of six months (30 credits), which involved the participation of 49 teachers from six different nationalities (Niger, Burkina Faso, Chad, Mali, France and Italy) and one period of six months of field training (30 credits).

Most of the courses have seen the integration of teachers from different universities delivering the lectures, including experts of ONGs, the International Fund for Agricultural Development (Ifad) of the United Nations, Delegation of the European Union Commission in Niger, the Protected Areas Division of the Nigerien Ministry of the Environment and from the staff of the RegionePiemonte (Cerutti, 2017). Moreover theoretical courses were alternated with practical courses: 8 field trips were carried out with the local support of the ONG Terre Solidali and the administration of the W National Park (Fig. 5 and Fig. 6). Seminars/debates, open to the participation of other students and researchers, completed the educational offer.



Figures5 and 6–Field trip to protected areas: the students' visit was guided by the teachers and staff of the W National Park.

The Master enrolled 10 students (5 Nigeriens, 3 Chadians, 1 Togolese and 1 Burkinabe, 1 woman, 9 men), with various specializations (agronomists, biologists, geologists, etc.). All participants have duly completed their study course by obtaining their Master's degree between April and July 2016 (Semita et al., 2017).

Sharing skills enabled the enrichment of the formative offer with diversified experiences which were reinforced in the various training modules. The importance of this dynamic was testified by the students, who noted that the regional dimension of training, as well as the North-South partnership, were the motivations to prefer the Master "Food Security and Environmental Sustainability"to the others available in their universities.

The Master was built on a core of knowledge that is already the subject of research-action carried out by the Cresa(land management and restoration, agro-pastoral production chains, small farmer organization and strategies, local development) with the disciplinary integrations offered by Burkinabe and Chadian teachers and by the members of the Cisao, in an institutional framework of sharing and collective vision of the themes (https://www.cisao.unito.it).

This approach takes into account the link between science and development, which has so far been neglected by political decision-makers in the Sahel countries, considering it strategic in order to increase the impact of research on improving the living conditions of the local population. (Barge et al., 2015; Semita and Ferrero, 2015).

The pedagogical programs agreed by the partners therefore consider the close relationship between research (emergence of new scientific knowledge), training (strengthening of professional capacities and infrastructures in the scientific and technological field) and innovation (transfer of appropriate basicknowledge).

The final dissertations of the graduates

The final dissertations (Fig. 7) of the first promotion of the Master II "Food Safety and Environmental Sustainability", took place at the Cresaof the Faculty of Agronomy of the University AbdouMoumouni of Niamey (Niger).

The titlesof the thesis of the students who have concluded the first edition of the Master are listed in Table2.

Figure 7 –The international Commission of the Master evaluated the candidates after their final dissertation, by B. Mola.

Student Name	Thesis title	Host Institution
Nazal Alhadji Markhous (Chad)	Multifunctional analysis of urban and peri-urban agriculture: the case of horticulture in the city of N'Djamena (Chad)	Institut Tchadien de la Recherche Agronomique pour le Développement N'Djamena, Chad
Izadine Ahmat(Chad)	Diachronic analysis of the indicators of the results of the harmonized framework in Chad for the period November 2013 - March 2015: the case of the regions Chari-Baguirmi, Mandouland Sila.	Centre Régional AGRHYMET Niamey, Niger
Adama Bamogo (Burkina Faso)	Contribution of biodigester technology to the sustainability of family farms in Burkina Faso	Programme National Bio-digesteur, PNB-BF Burkina Faso
Egle Homenya Komla (Togo)	Contribution of the intensive rice-farming system to the sustainability of farms in Southern Togo	ONG GRED (Groupe de recherche-action pour l'éducation au développement) Lomé, Togo

Soumeyla Abdoul-Zalili (Niger)	Water and soil potential for the development of irrigation in the Dallol Bosso: "Case of the Departments of Boboye and Falmey"	Lux Dev Conseil Régional Dosso, Niger
Abdoulkadri Djibrilla (Niger)	Artificial insemination in Niger: current situation and ways of improvement	PNAG Ministère Elevage Niamey, Niger
Garba Boulamine Mounkaila(Niger)	Socio-economic analysis of the effects of FAO interventions on strengthening the resilience of vulnerable households in the commune of Kalfou, Tahoua region	FAO Niamey, Niger
Abourahamane Toure Kadidiatou (Niger)	Diachronic analysis of Niger's harmonized framework of indicators for the period November 2013-March 2015: the case of Abala, Ouallam and Filingue departments	Centre Régional AGRHYMET Niamey, Niger
Alhassane Ahmad (Niger)	Use of improved millet varieties in rainfed agriculture in response to climate change: case of Tillabéry department	COOPI Niamey – Tillabéri, Niger
Djekornondé Miabe(Chad)	Analysis of vegetable crops and their contribution to the food security of market gardening households in the department of Dagana in Chad	Programme National de Sécurité Alimentaire COOPI N'Djamena, Chad

Table 2 – List of the thesis discussed at the end of the Master

A selection of papers was presented in the form of full articles (Bamogo*et al.*,2017; Boulamine and Soumana, 2017; Egle et al., 2017; Nazal et al., 2017), which illustrate the different themes and areas of sustainable development and food security that have been touched through the individual research and to insert these data in the cyclical vision of relationships and interconnections of sustainable development.The papers report the scientific results obtained by the students during the training. The students developed the knowledge acquired on different themesduring the first part of the Master with a practical application in the service of the host institutions, always emphasizing the multidisciplinary and holistic approach adopted.

On January 2017, the project supported the presence of faculty members and academic representatives from the partner institutions of Burkina Faso, Niger, Chad andItaly, in N'Djamena (Chad), where a synthesis of each dissertation (AA.VV., 2017a) was proposed in a poster exhibition (Fig. 8).

Figure 8 – Closing workshop of the project in N'Djamena (Chad). Visit of the delegates to the posters exhibit, by P. Barge.

Results in terms of employment

A survey of the conditions of employment of graduates, carried out six months after the end of the Master's degree, revealed that two graduates found their work just after the Master and that six, already employed, improved their situation.The two graduates who had no job at the time of the survey had a temporary experience that was a consequence of the Master.

The fact that all the graduates work in the disciplinary field of the Master demonstrates the adequacy of training to the demand of work in the sector.

These data, combined with the perception of the executives interviewed, show that the Master can contribute to better employability of young executives in the area of food security and environmental sustainability. The internship, in particular, has proved to be an excellent entry point into the labour market and for this reason it is an experience that deserves to be repeated and reinforced in future editions.

The Master also seems to contribute to the improvement of the conditions of employment,not only from the point of view of positions and functions, but also from a point of view of relationships and job satisfaction. Economic treatment is the only aspect on which improvement is limited.

The diffusion of educational products

Dissemination of project results and awareness raising on issues of food security and environmental sustainability were promoted through conferences, papers and panels. The Russade project produced teaching materials dedicated to the dissemination of several fundamental concepts of environmental themes and of sustainable development, considered in an integrated vision (AA.VV., 2017b; Semita, 2017).

Some concepts, which form the basis of the Russade project and the Master project and which can affect the everyday life of the whole population on aspects of public health, environmental protection and food security, have also been disseminated to a wider public and, in particular, to schoolchildren.

For this reason verbal communication has been integrated with images, developing posters that have highlighted explicit and implicit concepts often interconnected. Practical and interactive activities, as well as simple experimental activities, have been implemented using these same posters (Ferrero and Semita, 2016; Ferrero *et al*., 2016).

The Cisao team connected with Nigerien organizations engaged in rural areas, involved in sanitation or waste disposal, with the aim of creating synergies to raise awareness of their target audience during their interventions.

Periodic meetings for officials from different ministries and heads of NGOs and other institutions were held for informative seminars on the objectives and themes addressed by the project.

Seminars with groups of primary and secondary school teachers identified problematic aspects of the school environment, requiring interventions to raise awareness and encourage students to change their behavior. Between these, the problem of waste disposal, lack of personal hygiene, incorrect or insufficient feeding (Table 3).

Poster title	Authors
Protected areas: a resource for Africa	Riccardo Fortina& Giovanni Mortara
The bees for man and the environment	Marco Porporato
Friendly microbes and wicked germs in food	Roberto Ambrosoli
Why we must eat fruits and vegetables	Gabriele Beccaro

Protecting the environment by valuing the plastic waste	Maria Paola Luda
ONE HEALTH	Daniele DeMeneghi
DOGSVILLE: a table game to learn about rabies and dogs	Daniele De Meneghi
Use of agricultural residues to control deforestation	Stefano Bechis
Water is a precious resource: it must be correctly used and protected	Sabrina Bonetto& Manuela Lasagna
Good hygiene = Good health = Better future perspectives	TizianaNervo& Gabriella Trucchi

Table 3 –Dissemination material produced by the project.

To meet the needs of the schools, in collaboration with the Directorate of Human and Social Affairs of the Niamey City Council, the Nigerien NGO Eadpd (En avant pour un Développement Propre et Durable / Forward for a Clean and Sustainable Development), well experienced in the field of malnutrition and sanitation, was selected to carry out an educational intervention in five educational establishments in the Urban Community of Niamey on the theme of good hygiene and sanitation practices, waste management, gardening. A number of teachers, pupils, parents of students and even food and water vendors in schools have been identified as beneficiaries of awareness-raising and training activities (Trucchi *et al*., 2017).

The reports provided by the NGO charged of the above mentioned actions show that the teachers participated enthusiastically in the activities. Moreover, the NGO Eadpd demonstrated a great commitment in the accomplishment of tasks. From the experience emerged a need for training in certain topics such as renewable energies and other aspects of environmental sustainability (impact of individual behaviors, management and mitigation of environmental risk, etc.). It would therefore be desirable that universities and scientists be more open to the outside world, in the perspective of making knowledge available to the community.

Within schools, change should be visible in the short term if teachers become active and responsible actors, capable of transmitting their achievements within school communities and of controlling the health situation.

This awareness might raise a change in behavior and mentality capable of improving the state of health and living environment and, in the long term, induce a reduction in infant mortality.

Evaluation of the project activities

The involved partners considered the collaboration developed withthe teachers as an opportunity to exchange experiences and to strengthen the capacities of each institution, very fruitful in terms of supply planning and didactic methods. The integration of several professors into the modules of the Master, which was one of the main innovative elements of the project, proved to be an asset in terms of enriching the formative offer as well as strengthening the skills of the engaged professors. According to the questionnaires administered to teachers, sharing planning and implementation of didactic units was identified as an opportunity for skills building and a positive dynamic between the involved institutions. In conclusion the collaboration between teachers in the same didactic module was very well evaluated and considered an opportunity of the project (Mola, 2015; 2016; 2017).

Another indicator of the quality of relationships is the fact that all partners are motivated to re-propose the experience in order to make this Master a permanent part of the didactic offer of the different institutions and they even aspire to complete it with a path of Doctorate.

Final considerations

The Master, the main outcome of the project, proposes a didactic program that meets the priorities of the target countries by working on the development of local solutions, enhanced by collaboration with the Northern partner, which adds value in terms of expertise and innovation.

The well-established network between the partners activated a spontaneous process of shared participation and co-participative collaboration that allow the joint development of programs and projects to be submitted to different international and national calls.

The approach developed in the project aims to emphasize the links between learning, research and professional practice and to open new perspectives: the capacity to face problems in a systemic way in different contexts and to acquire professional skills to work on different environmental components, in compliance with the fragile and complex natural balances is in accordance with the overview adopted by the United Nations in the elaboration of the Sustainable Development Goals of the 2030 UN Agenda for Sustainable Development that cover the three dimensions of sustainable development (economic growth, social inclusion and environmental protection). These elements are

interconnected and all are crucial for the well-being of individuals and societies and they should be harmonized to achieve sustainable development.

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List of acronyms

ACP	African, Caribbean and Pacific Group of States
UE	European Union
Agrhymet	Centre Régional de Formation et d'Application en Agro météorologie et Hydrologie Opérationnelle
Cames	Conseil Africain et Malgache pour l'Enseignement Supérieur
Cisao	Centro Interdipartimentale di Ricerca e Cooperazione Tecnico Scientifica con l'Africa
Coopi	Cooperazione Internazionale
Cresa	Centre for Specialized Education in Agriculture
Eadpd	En Avant pour un Développement Propre et Durable
Fao	Food and Agriculture Organisation
Fed	Fonds Européen de Développement
Gred	Groupe de recherche action pour l'éducation au développement
HEI	Higher Education Institutions
Ifad	International Fund for Agricultural Development
Insta	Institut National de Sciences et Technologies of Abéché
Itrad	Institut Tchadien de la Recherche Agronomique pour le Développement

Lernse	Laboratoire d'Études des Ressources Naturelles et des Sciences de l'Environnement Université Polytechnique de Bobo Dioulasso
Lmd	License, Master, Doctorate
NGO	Non-Governmental Organization
Pnag	Programme National d'Amélioration Génétique des bovins locaux
Russade	Réseau des Universités Sahéliennes pour la Sécurité Alimentaire et la Durabilité Environnementale
Sdgs	Sustainable Development Goals
UN	United Nations

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SESSIONI SPECIALI

IL CONTRASTO PENALE AL TRAFFICO DI MIGRANTI NEL MEDITERRANEO NELL'ESPERIENZA ITALIANA: STRUMENTI, EFFICACIA E PROSPETTIVE.

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Negli interventi e nelle decisioni delle istituzioni, anche europee e interna-zionali, relative alla gestione dei flussi migratori sulla rotta del Mediterra-neo non si manca di sottolineare che l'obiettivo dell'azione è quello di con-trastare il traffico dei migranti e di smantellare le reti criminali a ciò dedite.

Ma è assai più raro che nel dibattito pubblico si entri un po' in profondità, ovvero che si ci soffermi sulle caratteristiche di questo fenomeno criminale, sul quadro giuridico – interno e internazionale – di riferimento, su cosa si è fatto sul piano giudiziario per contrastare il fenomeno, sui limiti e le ina-deguatezze che ci impediscono di aggredirlo efficacemente.

Perché l'autorità giudiziaria italiana e se ne occupa e perché essa segnala anche pubblicamente e con forza quando questa azione fallisce?

Nel nostro ordinamento giuridico un insieme di fattispecie puniscono le condotte *latu sensu* di sfruttamento, anche lucrativo, dell'immigrazione clandestina: 1) il delitto di favoreggiamento dell'ingresso e della permanen-za di migranti irregolari nel territorio dello Stato, del transito dei medesimi da uno Stato a un altro, con una serie di aggravanti, tra cui quella della transnazionalità; 2) il delitto di partecipazione o direzione di un'associazione a delinquere a tali delitti finalizzata; 3) reati comuni su-scettibili di rilevare nella materia nei singoli casi (omicidio, naufragio, etc.). attraverso tali fattispecie l'ordinamento di conforma a una serie di atti co-munitari e di strumenti internazionali: la Convenzione delle Nazioni Unite sul Crimine Transnazionale e il Protocollo addizionale sul Traffico di Mi-granti per terra, mare e aria, adottati con Risoluzione AG il 15.11.2000, siglati dagli Stati Parte a Palermo il 12-15.12.2000, entrati in vigore sul piano del diritto internazionale il 29.9.2003 e il 28.1.2004 e in Italia con la legge 16.3.2006 n. 146, che ha introdotto l'aggravante della transnaziona-lità, soddisfacendo in modo adeguato l'obbligo di recepimento interno delle fattispecie ivi previste.

Dalla Convenzione di Palermo discendono i seguenti obblighi dello Stato:

• prevenire e reprimere il traffico dei migranti via mare, via terra e via a-ria;

• promuovere la cooperazione tra gli Stati Parte a tal fine;

• tutelare al contempo i diritti dei migranti oggetto di traffico clandestino.

Convenzione e Protocollo ONU ci impongono' di puntare il faro ai reati di smuggling di natura transnazionale e nei quali è coinvolto almeno un gruppo criminale organizzato.

È su questo fenomeno che si punta l'attenzione dell'autorità giudizia-ria nel 2013, da quando aumentano esponenzialmente partenze e approdi in Italia e insieme le morti e i naufragi, con risultati - almeno in parte - storici e inediti.

Quale è lo scenario in quel momento?

Le reti dedite allo smuggling in Libia in quel periodo sono in fase di 'rior-ganizzazione' dopo gli anni della repressione ad opera di Gheddafi in virtù dell'accordo con l'Italia e poi della guerra civile. Una quota notevole delle partenze è dall'Egitto e gli sbarchi all'inizio sono ancora "spontanei".

La rotta egiziana, che punta sulla Sicilia Orientale e convoglia la crescen-te massa dei siriani e degli altri migranti in fuga dai territori dell'ISIS, si avvale, anche per la distanza geografica rispetto alle coste italiane, di grandi mezzi di trasporto e di equipaggi professionali, i quali usano trasportare i migranti su grandi navi madre fino alle acque internazionali per poi ivi trasbordarli su barchini al traino che proseguono fino alla Sici-lia, mentre la nave torna in Egitto, al riparo dalla giurisdizione dello Stato di mirato approdo.

Chi dovrebbe esercitare la giurisdizione? Ci si rende conto che le acque in-ternazionali sono una zona franca. Gli stessi strumenti di diritto interna-zionale oltre che le fattispecie di diritto interno sono impostate sulla giuri-sdizione di tipo classico, fondata sulla territorialità o al più sulla personali-tà attiva e passiva.

Si elabora, allora, una lettura delle norme sulla giurisdizione (art. 6, com-ma 2 c.p.) che permette di affermare: a) la giurisdizione italiana per con-dotte criminali di trasporto che si scoprono e si interrompono deliberata-mente in acque internazionali (per preservare natanti di valore e relativi equipaggi, essi stessi organici alle organizzazioni criminali, e provocare il soccorso del barchino insicuro); b) in parallelo, la legittimità dei poteri co-ercitivi in alto mare, tra cui sequestro e arresto (art. 110 Conv. Montego Bay e 8, par. 7, Protocollo sul traffico).

Non è un *escamotage* né una forzatura del diritto penale vigente: è una interpretazione che supera l'espediente fraudolento studiato dalle organiz-zazioni criminali per sottrarsi alla giurisdizione dello Stato di approdo.
Si scalfisce la percezione della impunità di cui avevano goduto i traffi-canti nei Paesi di partenza e transito, un fattore questo di auto-alimentazione della fama e del potere delle organizzazione.

Questo orientamento, che viene posto alla base di una strategia investiga-tiva organizzata di contrasto che si salda con il dispositivo Mare Nostrum e trova nelle Linee Guida della DNA de gennaio 2014 organica elaborazione, si estende alle traversate lungo la rotta turca del Mediterraneo orientale che nel 2014 punta alle regioni dell'Italia meridionale, fascia ionica (Puglia, Calabria e Sicilia) con navi mercantili dismesse, e ad altri delitti (428 e 575 c.p.), attraverso il principio della giurisdizione per connessione (rece-pito dalla Cassazione).
Es: Caso di omicidio di 49 morti per soffocamento nella stiva di un barco-ne dalla Libia (agosto 2015): degli otto libici imputati, i tre che hanno scel-to il rito abbreviato sono stati condannati alla pena di 20 anni dopo un anno e due mesi dai fatti.
Si ha prova di crescenti spregiudicatezza e crudeltà nel trattamento dei migranti trasportati, sempre più "merce a perdere".
I risultati di questa strategia: numerosi casi di apprensione e poi confi-sca di natanti di notevole stazza e valore, procedimenti penali, approdati a condanna, per associazione a delinquere (seppur di membri di livello me-dio bassi); identificazione di elementi apicali delle stesse organizzazioni, per i quali vengono attivate richieste di cooperazione giudiziaria e/o di e-stradizione verso Egitto e Turchia ex art. 18 Convenzione di Palermo.
L'azione di contrasto si estende anche alle "organizzazioni criminali di terra", che lucrano sulla inadeguatezza e sulle falle del "sistema Dublino" relativo alla competenza sulle domande di protezione internazionale, aiu-tando i migranti appena giunti a fuggire dai centri di accoglienza per rag-giungere i Paesi europei di agognata destinazione.
Esso ha fatto sì che gran parte dei Siriani e una parte di eritrei e somali (che negli anni 2013-2014 rappresentavano una consistente parte degli ar-rivi) non sia rimasta in Italia e abbia proseguito il viaggio grazie a organiz-zazioni criminali.
Oggi con il rafforzamento dei meccanismi di identificazione Eurodac e l'irrobustimento delle strutture è venuto meno l'incentivo delle reti crimi-nali a ciò dedite. Ciò non altera il giudizio di irrazionalità e iniquità del Re-golamento Dublino.

Questa vicenda ci segnala, però, un dato rilevante: allorché le istituzioni assumono il governo dei processi migratori, tolgono terreno ai traffican-ti, con un primo risultato, non trascurabile, di salvaguardare l'incolumità dei migranti ed evitare una forma di speculazione sul bi-sogno di spostarsi.

Nel 2014 riesplode però la rotta libica (dei 170.100 di quell'anno ben 141,000 vengono dalla Libia – a fronte dei 27,000 dell'anno prima – 15,000 dall' Egitto e 10.000 dalla Turchia).

Ma lo scenario è cambiato. Le nuove organizzazioni criminali libiche sono più spregiudicate e rapaci di quelle dell'epoca Gheddafi e di quelle egiziane e siriane: grazie all'anarchia e alla frammentazione politica seguite alla guerra civile, alla mancanza di unità e di reale autorità statuale, il mercato dello smuggling si è 'liberalizzato', vi è ampia disponibilità di armi da guerra, nessuno ha proceduto a un'opera di disarmo, i conflitti in parte continuano.

Le milizie para-militari stesse si riciclano come smugglers o appoggiano gangs dedite a tali traffici, assicurando loro una "cornice di sicurezza".

Cambia perciò il *modus operandi* delle organizzazioni criminali.

I trafficanti che organizzano le traversate dalla Libia, diversamente da quelle da Egitto e Turchia, non hanno bisogno di spingersi nelle acque in-ternazionali, perché il tratto verso le acque italiane è molto più breve.

Bastano barconi e gommoni. Le loro condotte si svolgono e si esauriscono esclusivamente nel contesto delle acque territoriale libiche.

I trafficanti libici procacciano i migranti e scelgono i conducenti dei natanti tra gli stessi aspiranti viaggiatori tra quanti hanno una pregressa espe-rienza di pescatori o conoscono l'inglese, istruendoli in modo avventizio e affrettato nella imminenza del viaggio, e ciò in cambio del mancato paga-mento dell'esoso prezzo del viaggio.

Il segmento di condotta imputabile a tali scafisti occasionali è sempre più ridotto, poiché spesso gli stessi libici conducono il natante nella prima fa-se, per poi affidare la guida al conducente e agli ausiliari prescelti nel mo-do detto, fino all'intervento soccorritore, il quale ormai avviene sempre più tempestivamente ad opera di navi civili delle ONG in servizio di volontario soccorso a ridosso delle *acque nazionali libiche*.

In tali casi i libici lasciano il gommone, trasferendosi a bordo di natanti più agili di supporto, che affiancano il gommone nel primo tratto di navi-gazione, recuperando - prima di lasciare i migranti -

motore extra-bordo e talvolta anche bussola e telefono satellitare, strumenti senza i quali la re-stante navigazione è resa ancora più insicura, per rientrare sulle coste li-biche.

In tale quadro arrestare gli scafisti dell'ultimo tratto non permette in alcun modo di scalfire le organizzazioni criminali e la strategia di contrasto in-trapresa nel 2013 e poi proseguita dopo non può funzionare. Essa è cali-brata per rotte di "lunga percorrenza", che richiedono l'investimento di mezzi di trasporto di valore ed equipaggi professionali, che si spingono fino all'area della a.i., la cui apprensione può segnare un colpo alle organizza-zioni.

In questo contesto interviene la Decisione del Consiglio della UE del 18 maggio 2015 n. 2015/778, istitutiva del dispositivo della UE Eunavfor Med. Il suo mandato è smantellare il modello dei trafficanti, mentre il sal-vataggio è solo tra i considerando introduttivi. Si articola in 4 fasi.

I risultati dell'operazione "Sophia" in termini di contrasto ai livelli apicali del traffico di migranti e alle relative dotazioni materiali e strutture logisti-che non sono però in linea con l'obiettivo fissato. Perché ?

Non per la sua natura di operazione 'militare' in sé, come paventato da al-cuni gruppi di opinione della società civile al momento del suo varo. Lo era anche Mare Nostrum. Piuttosto:

1) La circostanza che l'operazione non sia approdata al terzo *step*, cioè alla c.d. "fase 2 Bravo" del percorso stabilito e che, dunque, i suoi dispositivi militari non siano mai approdati alle acque territoriali li-biche (e ciò in mancanza di una risoluzione *ad hoc* del Consiglio di Sicurezza dell'Onu ovvero del consenso dello Stato interessato, la Li-bia, che ne costituivano il presupposto), rimanendo confinati nelle acque internazionali, impedisce di intercettare i "veri attori" del-lo *smuggling*.

2) EunavforMed non è supportata da un quadro giuridico omogeneo, capace di dare strumenti uniformi ed efficaci di contrasto in alto ma-re a tutti i dispositivi coinvolti. Mentre Mare Nostrum, oltre che ade-guata a quel modello di traffico, era parte integrante di un sistema omogeneo di relazioni tra istituzioni di P.G. e di A.G. dedicate al contrasto penale a quei reati. Mare Nostrum avevano ufficiali di P.G. a bordo e i suoi dispositivi si relazionavano in modo costante e diret-to - come hanno fatto dopo i dispositivi di "Mare Sicuro" - con l'Autorità Giudiziaria italiana, essendo parte d un sistema integrato. I dispositivi di Eunavfor Med non sono parte di un unico sistema i-stituzionale. Non hanno ufficiali di PG italiani a bordo, bensì ufficiali dei loro Paesi e rispondono all'A.G. dei Paesi di appartenenza e al-le regole dei rispettivi ordinamenti giuridici, e non a quelle del Paese che riconosce la giurisdizione. Esempio:

> Se in mare in a.i. una nave militare straniera scorge un natante di supporto con li-bici a bordo che si riavviano verso le acque libiche, dopo avere accompagnato un gommone di migranti con motore extrabordo e satellitare con sé, non tutti i dispositi-vi militari possono intervenire. Occorre rispondere alle seguenti domande : posto che è in corso la consumazione di un reato di smuggling, lo Stato di appartenenza della nave riconosce la giurisdizione *ratione loci* su tale fatto? L'Italia sì, gli altri Stati no (tranne Spagna).
> Può esercitare poteri di ispezione e abbordaggio? sì (dato l'art. 8, par. 7, del Protocol-lo e Ris. 2240/15 ONU SC).
> Può esercitare poteri coercitivi sulle *persone*? no, se non riconosce la giurisdizione.
> Al massimo potrà svolgerà attività di ispezione e abbordaggio ex art. 8 para 7 Proto-collo, nonché di rendicontazione (report) e segnalazione a una unità istituzionale ita-liana, la quale comunque potrà non essere nelle condizioni operative di intervenire subito.

3) allo stesso tempo la consapevolezza, nei trafficanti, della presenza a *ridosso delle acque territoriali libiche* di unità non istituzionali, co-me le navi delle ONG, prive - finora - di ufficiali di Polizia Giudiziaria e di personale attrezzato alla raccolta dei primi elementi di indagine, ha avuto un effetto di oggettivo incoraggiamento delle partenze, mol-tiplicandone il numero, con conseguente percentuale più alta di morti.

Così nel nuovo contesto (dalla fine del 2015) si apprendono piccoli natanti e in stragrande maggioranza soggetti di modestissima caratura criminale, il cui perseguimento ha poco più di un significato simbolico e non intacca in alcun modo la vitalità delle rete criminali e i loro floridissimi traffici.

Cambia anche la composizione dei flussi per nazionalità di provenienza. Il grande filone umanitario Siria/Iraq/Eritrea è largamente diminuito (dirottato sulla rotta orientale), ma si stringono o si rafforzano accordi crimi-nali sull'asse sub-sahariano e così singolarmente gli arrivi aumentano. Così anche le morti.

Questo permette di fare una riflessione, apparentemente banale.

Quando un "servizio" viene governato ed erogato in modo preponderante da organizzazioni criminali, esso sarà gestito con le logiche, gli scopi e i metodi propri di gruppi criminali. Tali gruppi non ispirano il proprio agire a scelte di valore e di razionalità, ma a logiche di puro *business* e a me-todi di violenza, minaccia, sopraffazione.

Per questo i flussi vanno governati dalle istituzioni secondo percorsi legali e non subiti passivamente.

In conclusione, a livello europeo e a livello ONU, occorrerebbero:

- □ regole più ampie e flessibili su giurisdizione e poteri coercitivi in modo che *qualunque Stato Membro* che accerta un crimine di smug-gling in acque internazionali, ma

oggettivamente rivolto a produrre i suoi effetti in uno degli Stati UE riconosca la propria giurisdizione e possa esercitare poteri coercitivi, ma, eventualmente, possa cederla (*op-ting out*) allo Stato di approdo del natante, ove questo, per la funzionali-tà e la tempestività delle indagini, sia meglio in grado di gestire la pro-secuzione di queste e il processo, i relativi atti urgenti di PG siano uti-lizzabili in condizioni di equivalenza agli atti interni.

- In tal senso non è concepibile che ancora oggi vigano regole assai meno ampie di quelle sulla pirateria.
- Regole che permettano di proseguire l'azione di contrasto nelle ac-que territoriali dello Stato di partenza, in supporto e di concerto con lo Stato stesso o in supplenza, ove questo per negligenza non si attivasse.

Ma più ci spingiamo verso il territorio dei Paesi dove si consumano princi-palmente questi reati, più si pone il tema della giurisdizione domestica degli Stati di radicamento delle organizzazioni criminali.

A perseguire questi reati dovrebbero essere primariamente gli Stati di transito e partenza dei flussi. Chi vigila?

Qui viene in rilievo il tema dell'effettivo recepimento della Convenzione di Palermo e dei suoi Protocolli addizionali nei Paesi maggiormente in-teressati. Libia, Niger e Nigeria hanno ratificato tutti e tre gli strumenti (per es, in Libia con la Legge 19/2010), ma non li hanno trasfusi in norme di diritto interno.

Es. Egitto non lo aveva fatto, ma lo ha fatto solo nel novembre 2016. Gra-zie all'emissione di tale legge esiste una base per la cooperazione giudizia-ria e un deterrente non insignificante per i trafficanti.

Manca un sistema adeguato ed efficiente di monitoraggio sulla effetti-va operatività della Convenzione di Palermo e dei Protocolli addiziona-li nei Paesi firmatari e che l'hanno ratificata (per cui non è dato sapere se uno Stato stia realmente ottemperando ai propri obblighi convenzionali), nonché di revisione/aggiornamento del contenuto di detti strumenti pattizi (che si rende opportuno e necessario, per es., anche alla luce di quanto detto sulla giurisdizione).

Diverso ed efficiente è il sistema di revisione della UNCAC- Convenzione ONU sulla Corruzione (cicli di revisione di 4 anni affidati a due Paesi sor-teggiati, report, coinvolgimento della società civile, etc.).

Da cosa può dipendere la riluttanza nei Paesi firmatari a recepire e appli-care il Protocollo e forse anche una certa indifferenza generale all'adozione di un meccanismo efficiente?
Va solo ricordato che lo *smuggling* ha molto a che fare con le politiche mi-gratorie, tema ad alta sensibilità politica.
La percezione della gravità di questo reato è più forte per i Paesi di immi-grazione piuttosto che di emigrazione, lo sfruttamento può essere occasio-ne di corruzione e/ di business o, come in passato (es. Libia di Gheddafi dell'ultimo periodo) di ricatto dei Paesi di approdo.
Occorre certamente investire e spendersi molto nell'adozione di un serio meccanismo di valutazione dell'effettività della Convenzione di Palermo e dei Protocolli addizionali.
Sono meccanismi lunghi.
Nel frattempo, qualcosa è cambiato e si è avviato un dialogo con i Paesi di transito e di partenza dei flussi.
Occorre, allora, investire anche sulla *capacity building* di questi Paesi.

Così come si è avviato un percorso di sostegno a una economica alternati-va e lecita, per togliere attrattiva economica all'"industria" dello *smuggling*, e così come si deve incoraggiare questi Paesi al rispetto dei diritti umani nel trattamento dei migranti, non può mancare il sostegno alla creazione, finalmente, *in questi Paesi* di un quadro normativo di contrasto penale al traffico di migranti e al graduale rafforzamento degli apparati giu-diziari e di polizia a ciò preposti.
Abbiamo anche dei segnali di comunità municipali in Libia (es. Zuwara) che in anni recenti (2015) si sono ribellate alle reti dei trafficanti insediate nel proprio territorio e hanno avviato una parziale opera di perseguimento giudiziario, con frutti molto modesti, proprio perché il sistema penale e quello giudiziario sono largamente inadeguati.
Noi italiani abbiamo una esperienza "maestra". Per decenni e decenni, for-se anche per secoli, le associazioni criminali di stampo mafioso hanno vis-suto e agito nella piena impunità, crescendo e rafforzandosi sempre di più.
Quando è stata adottata una legge (Rognoni La Torre) che ha introdotto il relativo reato e la confisca dei relativi capitali e un pool di giudici e investi-gatori ha inventato un metodo efficace di contrasto, queste associazioni si sono fortemente indebolite e hanno perso consenso sociale.
Questo è il mio auspicio e il mio contributo al lavoro "costruttivo" che fate voi, attori della Cooperazione allo Sviluppo.

SESSIONE POSTER

L'ACCOGLIENZA DEI MIGRANTI IN SICILIA. PROPOSTA DI UN SISTEMA INNOVATIVO HOTSPOT-HUB PER POZZALLO

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Sommario

La tesi tratta un tema tanto attuale quanto complicato e delicato: l'accoglienza dei migranti in Italia e più nello specifico nel porto di Pozzallo in Sicilia.
All'interno della tesi si è cercato di comprendere il fenomeno migratorio degli ultimi decenni e la risposta d'accoglienza da parte dell'Italia, dando una risposta da un punto di vista architettonico.
Infatti, nonostante il fenomeno migratorio sia un problema principalmente politico e programmatico, la progettazione dello spazio non dovrebbe essere secondaria per l'accoglienza e l'architettura potrebbe dare una soluzione al problema ponendo in primo piano le necessità delle persone e traducendole in un progetto.

Abstract lingua spagnola

Nuestra tesis trata de un tema tan actual como complicado y delicado: la recepción de inmigrantes en Italia y más específicamente en el puerto de Pozzallo en Sicilia.
Dentro de la tesis tratamos de comprender el fenómeno migratorio de las últimas décadas y la respuesta de acogida de Italia desde un punto de vista arquitectónico.
De hecho, a pesar de que el fenómeno migratorio es un problema principalmente político y programático, la planificación del espacio no debería ser secundaria para la acogida y la arquitectura podría dar una solución enfocándose en las necesidades de las personas y traducirlas en un proyecto.

Keywords

Accoglienza, architettura, immigrazione, Hotspot, Pozzallo

SESSIONE POSTER

Tesi

Oggetto della tesi

L'articolo scritto di seguito tratta un tema approfondito nella tesi di Laurea Magistrale in Architettura per il Progetto Sostenibile. La tesi si occupa in una prima parte di analizzare la crisi migratoria degli ultimi anni, studiando in parallelo la situazione dei conflitti mondiali attualmente attivi, i flussi e gli spostamenti e i conseguenti muri e barriere eretti per bloccare fisicamente il "problema dei migranti". In una seconda parte di questo lavoro ci si concentra in un contesto urbano più specifico, ovvero il porto di Pozzallo situato nella provincia di Ragusa, uno dei principali porti di sbarco italiani, dove è presente uno degli Hotspot della penisola.
Dopo uno studio attento del fenomeno si è cercato di far fronte, attraverso una proposta progettuale, ad alcune delle lacune emerse nel sistema di accoglienza italiano e nell'Hotspot di Pozzallo. Il progetto si propone di seguire le normative europee e nazionali sull'accoglienza e considerare la convenzione tra la Prefettura, l'Ufficio territoriale del governo di Ragusa ed il comune di Pozzallo per la gestione del centro accoglienza in questione. Nel caso specifico si è pensato ad una riorganizzazione dell'Hotspot associato ad un progetto, che si colloca tra la prima e la seconda accoglienza, caratterizzato da strutture che possono ospitare una lunga permanenza e atte all'inizializzazione di un processo di integrazione del richiedente asilo all'interno del Paese.

Inquadramento storico di un fenomeno che oggi diventa emergenza

Istantanea del mondo in guerra

Nell'ultimo decennio migliaia di uomini, donne e minori non accompagnati sono sbarcati, attraverso il mar Mediterraneo, in Italia e in Europa per fuggire da gravi violazioni dei diritti umani, da guerre, conflitti e persecuzioni in cerca di un luogo sicuro. Questi recenti avvenimenti e il continuo spostamento di persone attraverso le frontiere del continente europeo danno forma ad un nuovo assetto geografico della mobilità umana e anche un nuovo assetto di quei paesi che li ospitano.

La maggior parte delle persone scappa perché nel loro paese d'origine ci sono guerre internazionali o guerre interne e tensioni pericolose. Attualmente i conflitti più violenti sono in Siria, Iraq, Afghanistan e Turchia che insieme generano circa il 75% dei morti totali mondiali.

Le risposte delle nazioni a questo fenomeno sono due: la prima è stata definita "la non-accoglienza" che riguarda un atteggiamento di esclusione e chiusura nei confronti di queste persone, manifestata molto spesso attraverso la costruzione di muri e barriere. La seconda risposta al fenomeno è invece "l'accoglienza" che è il tema sviluppato all'interno della tesi.

Italia, porta d'Europa

Il sistema di accoglienza italiano

In particolar modo si è studiato com'è strutturato e come funziona il sistema di accoglienza italiano. Il sistema è composto da tre fasi: la prima è quella di primissima assistenza, in cui i rifugiati vengono accolti dopo lo sbarco e vengono visitati, identificati e fotosegnalati e possono fare richiesta di protezione internazionale. Queste procedure avvenivano all'interno di Centri di Primo Soccorso e Assistenza (Cpsa) che dal 2015 si stanno trasformando in Hotspot, punti strategici dove avvengono il maggior numero degli sbarchi, al cui interno vengono svolte le stesse funzioni dei Cpsa. In queste strutture i rifugiati dovrebbero permanere per 48 ore fino ad un massimo di 72. Dopo la primissima assistenza c'è la fase di prima accoglienza in cui i richiedenti asilo sono in attesa di una risposta da parte delle commissioni territoriali alla domanda di protezione internazionale. Queste procedure avvenivano all'interno di centri Centri di Accoglienza (Cda) e Centri di Accoglienza per Richiedenti Asilo (Cara) che dal 2015 si stanno trasformando in Hub. Il tempo massimo di permanenza in queste strutture dovrebbe essere quello di espletamento della domanda di protezione, quindi di circa trenta giorni. L'ultima fase è quella della seconda accoglienza in cui i rifugiati, dopo aver ricevuto la protezione internazionale, vengono inseriti in un Sistema di Protezione per i Richiedenti Asilo e Rifugiati (Sprar). In queste strutture ai rifugiati vengono dati gli strumenti per una prima integrazione nel Paese, quindi corsi d'italiano e corsi di avviamento professionale.

Durante le fasi di accoglienza i rifugiati che si rifiutano di essere identificati, che non fanno domanda di protezione o vedono la loro domanda respinta sono considerati irregolari e vengono accompagnati all'interno dei Centri di Identificazione ed Espulsione (Cie) e in seguito saranno allontanati dal paese.

Analizzando in modo approfondito come funziona il sistema accoglienza italiano sono emersi alcuni aspetti critici: il primo riguarda il sistema di seconda accoglienza; infatti se da questi centri i

richiedenti asilo che hanno concluso il loro percorso di accoglienza non vengono integrati nella società, allora non si liberano posti per nuovi beneficiari quindi l'intero sistema di accoglienza si blocca e i centri Hotspot e Hub si trasformano in centri di detenzione forzata. Un altro punto critico è la lentezza burocratica con cui le commissioni territoriali danno una risposta alle domande di protezione internazionale. Per quanto riguarda l'Hotspot non esiste ancora nessuna normativa europea che disciplini quello che debba avvenire all'interno del centro e quindi manca l'organizzazione della prima fase del sistema accoglienza. Infine è quasi del tutto assente la comunicazione tra rifugiati e mediatori culturali che non sono presenti nelle varie fasi di accoglienza e per questo si trovano spaesati di fronte alle procedure che devono affrontare.

Pozzallo, porta del Mediterraneo

L'Hotspot di Pozzallo

È stato scelto come oggetto della tesi il porto di Pozzallo perché uno dei principali porti di sbarco d'Italia. Qui è presente inoltre una delle cinque strutture Hotspot italiane di cui Medici Senza Frontiere ha redatto un rapporto evidenziando la natura dei diversi problemi con cui l'organizzazione si è confrontata durante la permanenza nel centro.

Msf all'interno del loro rapporto illustrano ed evidenziano la natura dei diversi problemi con cui si sono confrontati durante la loro permanenza nel centro.
Le principali criticità riscontrate sono: una mancanza di spazi adeguati ad ospitare il numero elevato di persone; sovraffollamento del centro e dei suoi spazi dovuto alla permanenza prolungata; struttura insalubre dovuta a infiltrazioni di acqua che creano muffe; promiscuità dei luoghi, non c'è una separazione di genere e uomini, donne e bambini condividono gli stessi ambienti; assenza di un'area dedicata ai bambini e in particolare ai minori non accompagnati e infine mancanza di mediatori culturali che aiutino i rifugiati a comprendere le vare procedure.

Gli aspetti critici riscontrati all'interno dell'Hotspot di Pozzallo e in generale nel sistema d'accoglienza italiano sono stati isolati, valutati e si è tentato di dare una risposta attraverso alcuni criteri architettonici che sono la sostenibilità economica e la reversibilità degli spazi, ricercati attraverso l'uso del container High Cube.

Il progetto

Tra prima e seconda accoglienza

La tesi propone di dare un contributo architettonico in termini di emergenza, con l'utilizzo di risorse minime, andando a riorganizzare il sistema accoglienza dell'Hotspot di Pozzallo, limitando nell'Hotspot le funzioni di carattere sanitario e identificativo, e affiancando mediatori culturali ai rifugiati in ogni fase del processo.
All'Hotspot è stato associato un centro accoglienza Hub, luogo pensato per non essere solamente un luogo di attesa, ma anche un luogo vivibile dove vengono dati ai rifugiati gli strumenti per una prima integrazione nel Paese. Quindi all'interno dell'Hub sono state integrate alcune funzioni del sistema di seconda accoglienza Sprar e per questo motivo possiamo collocare il progetto tra prima e seconda accoglienza.

Attualmente dopo lo sbarco i rifugiati vengono visitati ed identificati direttamente sulla banchina del porto e successivamente trasferiti all'interno della struttura per la richiesta di protezione internazionale; il progetto propone di accogliere i migranti sulla banchina ma di svolgere le funzioni sanitarie e quelle identificative in strutture adeguate. Ogni rifugiato, diviso per categoria, deve superare una fase di triage medico, in cui vengono assegnati i codici che permettono di suddividere i tempi di attesa in base alla gravità del paziente; successiva a questa c'è una fase di screening medico in cui i rifugiati vengono visitati in maniera più approfondita con il supporto di ambulatori specializzati. Per ogni evenienza è stato inserito un centro di osservazione nel caso si riscontrino anomalie o patologie che necessitano un maggior controllo e terminate le visite mediche i rifugiati passano alla seconda fase che prevede l'identificazione, il fotosegnalamento e la richiesta di protezione internazionale. (Figura 1).

Figura 1 –Vista al momento dello sbarco.

I rifugiati che hanno terminato il loro percorso all'interno dell'Hotspot vengono trasferiti all'interno dell'Hub, l'accoglienza vera e propria inizia qui. La struttura d'ingresso è dedicata ai servizi logistici: viene distribuito un kit di abbigliamento e per l'igiene personale e successivamente vengono spiegate loro le regole di permanenza all'interno dell'Hub e assegnate le stanze e i compiti da eseguire. Terminata l'assegnazione i rifugiati vengono accompagnati ai moduli abitativi.

Un elemento importante, in ogni fase del progetto, è la separazione di genere: infatti subito dopo lo sbarco i rifugiati vengono divisi in tre categorie che sono uomini, donne e famiglie e minori non accompagnati. Queste tre categorie seguono tre percorsi separati e hanno aree a loro dedicate in tutto il progetto. Sono state progettate all'interno dell'Hub: un'area d'ingresso dove i rifugiati vengono accolti e da qui accompagnati nelle tre aree dedicate alle abitazioni, tre strutture dedicate a mensa e laboratori, un edificio scolastico per i minori e un luogo di culto neutrale dove diverse etnie e religioni possono coesistere. (Figura 2).

Figura 2 –Vista al momento dell'ingresso dell'Hub.

Il modulo abitativo è unico ma si differenzia per la distribuzione interna delle stanze per assecondare le esigenze delle tre categorie. Date le caratteristiche del clima molto caldo di Pozzallo, tutti i moduli abitativi, così come gli altri edifici del progetto, presentano una tettoia. Questa è realizzata tramite una griglia metallica di pilastrini e travetti saldata alla copertura dei container, l'elemento che contribuisce all'ombreggiamento vero e proprio è il bambù che viene incastrato all'interno della griglia. (Figura 3).

Figura 3 –Vista del modulo abitativo.

È stata progettata una struttura scolastica dedicata solamente ai minori non accompagnati in cui ci sono aule pensate per lezioni frontali dove viene insegnata la lingua italiana o altre materie utili, laboratori, quindi spazi più ampi dove possono essere insegnate discipline pratiche o di gioco e infine aree gioco e di apprendimento per i più piccoli. L'edificio stesso è il gioco principale per minori, infatti alle estremità dei container ci sono elementi quali: scivoli, pareti e reti d'arrampicata che permettono di raggiungere la copertura dei container e quindi di poter correre e camminare sul tetto della scuola; si creano quindi dei percorsi di salita e di discesa che rendono divertente la scuola stessa.
(Figura 4).

Figura 4 –Vista della struttura scolastica.

Un'altra struttura pensata all'interno del progetto è il luogo di culto. Il ruolo della religione, si sa, all'interno dei fenomeni migratori è di fondamentale importanza infatti le tradizioni e i riti religiosi sono parte essenziale del legame che unisce ogni persona alle sue origini. Per progettare questo luogo di culto è stato necessario soffermarsi a studiare la composizione degli spazi e i differenti modi di svolgere le funzioni religiose delle tre religioni maggiormente praticate dai rifugiati che arrivano sulle coste italiane. Il risultato di queste ricerche ci ha portate a definire uno spazio

neutrale dove diverse etnie e religioni possono coesistere. (Figura 5).

Figura 5 –Vista della struttura religiosa.

Il ruolo dell'architettura

Un progetto per l'accoglienza

La crisi migratoria non è destinata a fermarsi in tempi brevi, i dati degli ultimi anni sono sempre più allarmanti e come tali non si può più pensare al fenomeno con carattere emergenziale e temporaneo. É necessario che le istituzioni europee e italiane concentrino energie e fondi per riorganizzare un sistema che funzioni e che metta in primo piano l'accoglienza.

Questa tesi ha permesso di approfondire un argomento molto attuale e complicato quale il fenomeno migratorio in Italia e in Europa. Si è potuto studiare meglio l'organizzazione dei centri accoglienza italiani comprendendo quali sono gli aspetti che si possono migliorare, gli elementi di criticità e le lacune burocratiche del nostro sistema.

L'obiettivo è quello di progettare un apparato di accoglienza il più possibile organizzato per dare una risposta immediata alla necessità di ulteriori spazi e strutture ricettive e visti gli attuali tempi di permanenza, rendergli quest'ultima più umana e sopportabile. Non solo, si è pensato inoltre ad un sistema che segua le normative europee e italiane ma che al tempo stesso ponga al centro la sicurezza e l'integrazione dell'individuo.

La tesi in conclusione si propone di progettare un modello di accoglienza, replicabile in qualsiasi altro contesto, che non è legato al luogo in cui si va ad intervenire.

I due criteri di progetto della tesi, temporaneità e sostenibilità economica, secondo l'idea di questa tesi dovrebbero essere un punto chiave e di partenza per una progettazione di questo tipo, ma le scelte compositive e tecnologiche invece, potrebbero variare in base al contesto geografico in cui ci si trova.

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Lista degli acronimi

Cara	Centri di Accoglienza per Richiedenti asilo
Cda	Centri di Accoglienza
Cie	Centri di identificazione ed espulsione
Cpsa	Centri di Primo Soccorso e Accoglienza
Msf	Medici Senza Frontiere
Sprar	Sistema di protezione per richiedenti asilo e rifugiati

SESSIONE POSTER

IL CUCI E GLI STUDENTI DELL'UNIVERSITA' DI PARMA: UN'ALLEANZA CHIAVE PER RAFFORZARE I LEGAMI CON LA SOCIETA' CIVILE

THE CUCI AND THE STUDENTS OF THE UNIVERSITY OF PARMA: A KEY ALLIANCE TO DEEPEN THE LINK WITH THE CIVIL SOCIETY

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Sommario

Nel 2005 è stato fondato il Centro Universitario di Cooperazione Internazionale dell'Università di Parma (CUCI) con l'obiettivo di implementare progetti di cooperazione e ricerca e stabilire un dialogo e una cooperazione, sostenibile e inclusiva, con i paesi "lowincome". A tal fine, il CUCI cerca di potenziare gli attori coinvolti nei progetti promuovendo la collaborazione con università, istituzioni pubbliche e partner locali e internazionali. In tale processo sono stati coinvolti gli studenti come attori che possono offrire un contributo alle attività del centro e rappresentare un ponte tra il CUCI e la società civile, sia a livello locale che internazionale.

Abstract

In 2005, the University of Parma established the CUCI - Academic Centre for International Cooperation – to foster international cooperation projects and research. The CUCI's mission lies in establishing a sustainable and inclusive cooperation with developing countries. To this aim, the CUCI seeks to empower the actors involved in the projects by fostering collaboration with universities, public institutions and local and international partners. Professors of the CUCI realised the importance of involving young students in that they can give a great contribution to the activities of the centre and act as bridge between the centre itself and the civil society.

Keywords

University, decentralised cooperation, students participation.

Introduzione

Dagli anni '90 emerge un forte dibattito intorno alla Cooperazione Internazionale allo sviluppo, sia per la diminuzione dei fondi destinati all'Aiuto Pubblico allo Sviluppo (APS) da parte dei paesi donanti in relazione al loro Prodotto Interno Lordo (PIL), sia perché viene messa in discussione l'efficacia e l'efficienza dei programmi stessi.

Per Pereira Nieto (2001) e GonzálezNorris y Jaworski (1990), la cooperazione allo sviluppo ha servito gli interessi geopolitici, economici, militari e d'immagine dei paesi promotori; così, con lo sviluppo della globalizzazione e il dominio del pensiero neoliberale, le politiche d'aiuto si sono uniformate alle politiche globali dei paesi dominanti. Pertanto, emerge il rischio di fomentare azioni che aumentano la polarizzazione e lo sviluppo asimmetrico (Maestro y MartínezPeinado, 2012). Secondo Alonso (2004), gli aiuti hanno generato effetti negativi nel disincentivare il risparmio nazionale, incrementare la dipendenza dei paesi recettori, aumentando la corruzione e il potere delle burocrazie. Llistar (2008) identifica pratiche di anticooperazione che hanno dominato lo scenario degli aiuti internazionali. L'autore lo definisce come l'insieme di interferenze negative rese attive dal Nord verso il Sud e che rispondono a un interesse geopolitico del donante, difendendo una cultura di ricezione passiva per i beneficiari.
Carrino (2005) sottolinea le distorsioni prodotte dalle azioni di Cooperazione Internazionale, generate da azioni settoriali e di corto periodo che producono passività e dipendenza della popolazione beneficiaria, e da gestioni finanziarie altamente burocratizzate. Anche Rodríguez Carmona (2009) parla di "progettorato" come un'inclinazione metodologica caratterizzata dall'orientamento eccessivamente tecnico del personale delle ONG,impegnato a captare i fondi disponibili. In tal modo, le organizzazioni entrano in un circolo vizioso di elaborazione di progetti settoriali e di corto periodo per garantire la sopravvivenza istituzionale, perdendo di vista l'obiettivo di lungo periodo di trasformazione sociale.

Parallelamente a tali dibattiti, sono stati organizzati fori, come quelli di Parigi (2005) e Accra (2008) dove un centinaio di entità tra soci bilaterali, internazionali, Istituzioni Finanziarie e Paesi in via di sviluppo, hanno espresso la necessità di promuovere nuove soluzione affinché gli aiuti internazionali possano raggiungere i loro obiettivi e determinare impatti stabili.

Per cercare di dare una risposta alla crisi della cooperazione, alla ricerca di nuovi approcci e legittimazione, sorge una modalità politica di cooperazione innovativa focalizzata sugli attori,chiamata cooperazione decentrata(UNDP). Secondo la definizione italiana, offerta dalla Direzione Generale per la Cooperazione allo Sviluppo del Ministero Affari Esteri, per cooperazione decentrata s'intende:"*l'azione di cooperazione allo sviluppo svolta dalle Autonomie locali italiane, singolarmente o in consorzio fra loro, anche con il concorso delle espressioni della società civile organizzata del territorio di relativa competenza amministrativa, attuata in rapporto di partenariato prioritariamente con omologhe istituzioni dei paesi in via di sviluppo (Pvs) favorendo*

la partecipazione attiva delle diverse componenti rappresentative della società civile dei paesi partner nel processo decisionale finalizzato allo sviluppo sostenibile del loro territorio."

Dalla definizione si osserva l'importanza che viene attribuita al partenariato tra territori (partenariati territoriali), come rapporto virtuoso tra Autonomie locali e soggetti del territorio, sia del mondo sociale che economico e culturale. Questo risulta fondato sui principi di sussidiarietà verticale ed orizzontale, e dello sviluppo partecipativo (Stocchiero, 2007). La cooperazionedecentrata rappresenta un nuovo modo di concepire lo sviluppo equo e sostenibile tra i popoli, fondato sulla partecipazione, sulla promozione dei diritti umani e delle libertà fondamentali, sulrafforzamento delle capacità e dei poteri degli attori decentrati e in particolare dei gruppi svantaggiati, considerando in maggior misura i bisogni e le priorità delle popolazioni partner nei loro contesti di vita (Comitato di collegamento delle ONG di sviluppo presso l'Unione europea, 1999; Stocchiero, 2007). Tale cooperazione pone al centro gli attori locali, le organizzazioni della società civile, le comunità dei paesi partner che si trasformano da "beneficiari" passivi a soggetti attivi del proprio processo di sviluppo. Non si tratta quindi di proporre progetti settoriali e di corto periodo, ma di accompagnare le comunità locali nel proprio processo di *empowerment*e sviluppo in una visione di medio e lungo periodo. Si tratta di costruire un partenariato fondato sulla fiducia, sul dialogo aperto e trasparente per stabilire obiettivi comuni, definire ruoli e responsabilità tra i soggetti inclusi nel processo (Bossuyt, 2004).

La cooperazione decentrata è l'approccio scelto dal Centro Universitario di Cooperazione Internazionale, un centro interdipartimentale nato all'interno dell'Università di Parma nel 2005, interessato a mettere a disposizione delle regioni *lowincome* l'insieme delle conoscenze di tutte le facoltà dell'Ateneo. Il Centro si propone, infatti, di individuare, valorizzare e coordinare le risorse tecniche e scientifiche presenti per il raggiungimento degli obiettivi di cooperazione, tra cui: (i) contribuire attivamente allo sviluppo dei paesi a più elevata povertà, mettendo a disposizione le competenze scientifiche/professionali presenti nell'ateneo; (ii) costruire relazioni stabili con le istituzioni del territorio allo scopo di evitare dispersione di risorse e raggiungere "massa critica" e continuità nell'intervento; (iii)accumulare e sistematizzare le conoscenze sulle pratiche dei modelli di intervento più efficaci.

Allo stesso scopo il CUCI promuove le relazioni tra l'Ateneo e i soggetti istituzionali, economici e della società civile che condividono le stesse finalità e che vogliono impegnarsi nella realizzazione di iniziative concrete e nell'attivazione di progetti comuni.La specificità del Centro è essere

emanazione diretta dell'Università di Parma, delle persone che vi operano, dei dipartimenti che la costituiscono e come tale ha come obiettivi, oltre alla promozione e realizzazione di interventi operativi, l'elaborazione e l'attuazione di progetti di ricerca interdisciplinari e di iniziative sperimentali finalizzate a migliorare le conoscenze sulle condizioni che favoriscono lo sviluppo umano e sociale nei contesti ad elevata povertà.

Dopo anni di lavoro, e numerose esperienze in ambito di cooperazione in Africa e America Latina, il CUCI ha sentito la necessità di avviare una riforma nella propria organizzazione e struttura interna per poter diventare un punto di riferimento, non solo per i partner esteri, ma anche e soprattutto per gli studenti dell'Ateneo, come soggetti attivi nella promozione e nell'implementazione di azioni che nascono sul territorio e che coinvolgono tanto gli attori locali come quelli internazionali. Pertanto, sulla base dell'esperienza del CUCI, il presente articolo muove una riflessione sul ruolo che possono assumere gli studenti universitari nelle azioni di cooperazione decentrata, come ponte tra il centro universitario e la società civile, e sull'atteggiamento/ le possibili azioni di coinvolgimento che un centro di cooperazione universitario può mettere in atto per includere i propri studenti nei processi di cooperazione.

Obiettivi e metodologia

Le sfide proposte dal mondo della cooperazione,in generale, e in ambito universitario, in specifico, hanno spinto il gruppo di docenti del CUCI a porsi nuovi obiettivi per rendere le proprie azioni maggiormente efficaci ed efficienti nel dare una risposta alle esigenze che nascono dai propri studenti e dalle organizzazione della società civile. A tal fine il CUCI ha impostato una strategia per includere gli studenti e studentesse dell'Ateneo nel dibattito sulla cooperazione e nella costruzione di nuove azioni basata sul mantenimento di un dialogo costante con tali attori. La loro partecipazione è stata considerata fondamentale per alimentare e arricchire i progetti del CUCI e, allo stesso tempo, rendere il Centro un punto di riferimento per gli studenti motivati a sviluppare loro iniziative coerentemente alla missione del Centro. Pertanto, il CUCI si è posto i seguenti obiettivi:

- Coinvolgere gli studenti nelle attività rivolte al rafforzamento dei rapporti di collaborazione con le organizzazioni e associazioni di cooperazione presenti sul territorio (provincia di Parma)

- Coinvolgere gli studenti nella costruzione di rapporti di collaborazione per avviare nuovi programmi di scambio nei paesi lowincome.
- Coinvolgere gli studenti internazionali nel disegno e realizzazione di iniziative dal basso che possano rispondere alle loro domande in termini di cooperazione con i loro paesi d'origine.

Per raggiungere tali obiettivi, il gruppo di docenti del CUCI ha seguito un percorso di lavoro focalizzato a stabilire un rapporto di mutua collaborazionecon gli studenti dell'Ateneo. In primo luogo il Centro ha lavorato per migliorare la propria visibilità e comunicazione attraverso i social network e il miglioramento della pagina web, per raggiungere un maggior numero di studenti e studentesse. Inoltre, i progetti rivolti alla formazione all'estero impulsati dal CUCI hanno permesso di avvicinare numerosi studenti al Centro. Il programma Overworld ha infatti consentito a 15-20 studenti/esse dei Dipartimenti di Medicina e Chirurgia, di Discipline Umanistiche, Sociali e delle Imprese Culturali e di Scienze economiche e aziendali, di svolgere un periodo di tirocinio in paesi *lowincome* durante l'a.a. 2015/2016. Grazie a tali azioni si è costituito un gruppo di giovani che, in collaborazione con il CUCI, ha organizzato una serie di incontri per condividere le proprie esperienze, generare un dibattito e una riflessione sulla cooperazione internazionale, ed aprire un dialogo con altri studenti interessati a proporre nuove iniziative. In tal modo il CUCI ha promosso la creazione di uno spazio per accogliere le proposte di attività provenienti dagli studenti nel tentativo di dare delle risposte ai loro bisogni. Il gruppo docente ha quindi integrando le proprie conoscenze scientifiche per sviluppare tali attività, promuovendo le possibilità di ricerca e scambi con realtà internazionali.

Risultati

La partecipazione degli studenti nella ricerca: un'occasione per rafforzare i legami tra l'Università e il territorio

La collaborazione con gli studenti ha favorito la loro partecipazione all'interno di un progetto realizzato sul territorio della Provincia di Parma, dal titolo "Lo stato dell'arte della cooperazione internazionale per lo sviluppo a Parma". L'iniziativa, promossa dal CUCI,mirava al rafforzamento di legami, l'ampliamento delle conoscenze e lo sviluppo di opportunità di collaborazione tra associazioni e organizzazioni nel settore della cooperazione allo sviluppo, associazioni di migranti e istituzioni operanti nel territorio di Parma e Provincia. All'interno della strategia di terza missione

dell'Università, ci si è proposti di svolgere un ruolo di animazione, coinvolgimento e raccordo delle diverse organizzazioni e esperienze operanti nel territorio. Gli studenti hanno contribuito alla costruzione della metodologia di lavoro così come alla fase di raccolta e interpretazione dei dati, mappando i soggetti che svolgono cooperazione allo sviluppo a Parma e realizzando interviste telefoniche e focus group. Tali azioni hanno permesso di censire la numerosità e individuare le caratteristiche dei soggetti che svolgono cooperazione allo sviluppo sul territorio, analizzando gli obiettivi perseguiti, le forme organizzative adottate e le conoscenze accumulate. Inoltre, gli incontri con le organizzazioni in occasione dei focus groups hanno favorito lo scambio di esperienze tra le associazioni e ONG, ponendo le basi per promuovere la realizzazione di progetti comuni o integrati. Attraverso il progetto, sono infatti emerse le esigenze di consolidamento delle organizzazioni attive e delle loro strategie di medio periodo e la necessità di realizzare un coordinamento stabile dei soggetti impegnati nella cooperazione allo sviluppo a Parma. I risultati della ricerca sono stati restituiti alle organizzazioni intervistate e trasmessi alle istituzioni pubbliche ponendo le basi per la costituzione del Sistema Territoriale Parma per la Cooperazione Internazionale. Si tratta di una Associazione di secondo livello che riunisce Enti pubblici ed organizzazioni del Terzo Settore finalizzato a promuovere e praticare la cooperazione decentrata per sostenere progetti, programmi e processi di sviluppo umano sostenibile sia sul territorio parmense che nei Paesi svantaggiati, seguendo criteri di solidarietà, rispetto delle culture e delle identità delle rispettive comunità. In tal senso, la partecipazione degli studenti nell'ambito della ricerca ha permesso l'avvio di un'esperienza, tutt'ora in corso, di rafforzamento e coordinamento delle associazioni e ONG locali che operano nel settore della cooperazione con la collaborazione delle istituzioni locale.

Le iniziative degli studenti per la costruzione di rapporti di collaborazione con istituzioni congolesi

L'interesse da parte di alcuni studenti dell'Ateneo che hanno svolto periodi di volontariato in Congo ha permesso di iniziare ad avviare accordi formali tra l'Università di Parma e alcune istituzioni congolesi.

Attraverso l'esperienza di alcuni studenti della Facoltà di Medicina e Chirurgia e del Dipartimento di Giurisprudenza, è stata avviata una collaborazione conl'Università Cattolica di Bukavu per avviare dei programmi di scambio di docenti e studenti; è stato inoltre avviato l'accordo con la Commissione Justice et Paix che si occupa della tutela e dell'accompagnamento psico-sanitario e

giuridico di donne e bambini vittime di violenze e abusi, grazie ad una collaborazione già esistente con studenti della nostra Università; infine, sono stati avviati i colloqui per un progetto che coinvolge i Salesiani di Parma e una loro missione in Congo.Il progetto prevede l'iscrizione di alcuni giovani congolesi presso l'Università di Parma garantendo specifici be benefici alle nuove matricole quali riduzione o azzeramento delle tasse di iscrizione. Anche questa collaborazione in ambito formativo nasce dall'esperienza di uno studente di economia, sacerdote salesiano congolese, in collaborazione con l'ambasciata italiana in Congo e con la congregazione dei Salesiani.
Le circostanze politiche del paese, caratterizzate da una forte instabilità politica e sociale, hanno portato a una sospensione delle attività. Nonostante questo, la collaborazione con tali istituzioni è continuata sul piano della programmazione. Tale esempio mostra l'importanza di accogliere e integrare alla vita universitaria le esperienze degli studenti che si trasformano in ponti tra il nostro Ateneo e istituzioni straniere all'interno di una strategia di internazionalizzazione dal basso.

La collaborazione con gli studenti camerunesi come impulso per progetti di formazione, ricerca e accompagnamento.

Durante gli incontri promossi dal gruppo dei giovani in collaborazione con il CUCI, Un gruppo di studenti camerunesi hanno manifestato il bisogno di ricevere un supporto per rafforzare le attività agricole (principalmente la produzione del cacao e plantano) che stanno sviluppando nel loro paese d'origine. In specifico è giunta la richiesta al CUCI di sviluppare un'analisi di fattibilità e programmazione futura di tali attività con l'obiettivo di avviare un progetto per l'esportazione di cacao. Per questo, nel giugno 2016 è stata organizzata una serie di quattro incontri che ha visto la collaborazione tra il gruppo di studenti camerunesi e i docenti e ricercatori del Dipartimento di Scienze Economiche e Aziendali (DEA) che aderiscono al CUCI. Questi ultimi si sono resi disponibili a realizzare tale iniziativa adattando alle attività agricole un modello di business plan denominato Teem (Tool for the Economic Evaluation of Micro-Enterprises) e originariamente pensato per l'analisi di piccole attività manifatturiere. A tale iniziativa ha preso parte anche il gruppo di studenti della facoltà di Economia in partenza per la Tanzania con il progetto Overworld, con l'obiettivo di svolgere un periodo di ricerca presso il centro "Child in the Sun", una organizzazione non a scopo di lucro che si prende cura di ragazzi dai 10 fino ai 18 anni che vivono in strada o in circostanze estremamente difficili. Durante tale esperienza i borsisti overworldavrebbero utilizzato lo stesso modello di Teem per analizzare la sostenibilità economica

e finanziaria delle attività produttive di carattere agricolo svolte dalla comunità. Nel corso degli incontri è stato presentato il Teem, adattato, grazie alle osservazioni degli studenti presenti (basate soprattutto sulle loro esperienze concrete) e provato sulla base dei dati disponibili nei casi della coltivazione di plantano e cacao in Camerun. In tale occasione, una studentessa camerunese ha colto l'opportunità di approfondire l'argomento in una tesi di laurea specialistica. L'iniziativa ha avuto quindi una dimensione formativa e sperimentale ma anche una dimensione di scambio e incontro culturale. Sono stati molteplici e preziosi, infatti, i consigli offerti dagli studenti camerunesi al gruppo italiano in procinto di svolgere un mese di studio/tirocinio in Africa. Inoltre, si è venuto a conformare un gruppo di lavoro che ha presentato un progetto per la costituzione di una cooperativa di produzione sostenibile e commercializzazione al bando Coopstartup Emilia Ovest.

Riflessioni conclusive

L'iniziativa di collaborazione tra il CUCI e gli studenti e studentesse dell'Università di Parma ha portato allo svolgimento di un lavoro integrato tra docenti, ricercatori e studenti, ponendo le basi per una collaborazione futura sempre più intensa. Grazie al supporto dell'esperienza, strumenti e conoscenze scientifiche del corpo docente, le proposte sorte dal basso si sono trasformate in iniziative concrete sia in ambito di ricerca, che di formazione. Tale percorso ha permesso al CUCI di avvicinarsi agli studenti, cercando di dare delle risposte alle loro richieste e necessità. Il tal modo sono sorte esperienze innovative, di mutuo arricchimento. Inoltre, gli studenti hanno svolto un ruolo ponte tra l'Università di Parma e le istituzioni di paesi "lowincome", fungendo da promotori di nuove collaborazioni che permettono l'ampiamento dell'offerta formativa dell'Ateneo.

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SESSIONE POSTER

PARTICIPATORY DESIGN OF ROOFTOP WATER HARVESTING SYSTEMS FOR SMALLHOLDER FARMERS' IN THE CORRIDOR SECO REGION, GUATEMALA

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Sommario

La Regione del Corridor Seco, Guatemala è da sempre soggetta a crisi alimetari, aggravate da climate change, degradazione del suolo e scarsità idrica. L'adozione di sistemi di raccolta di acqua piovana da tetto rappresenta una fonte di accesso fondamentale alla risorsa idrica, specialmente nelle comunità rurali. Il presente lavoro propone un approccio di progettazione partecipata per il miglioramento di tali tecnologie nel dipartimento di Camotán, sulla base del quale sono state realizzate 23 nuove installazioni. I risultati del progetto mostrano che tutti i nuovi sistemi sono funzionanti e che la raccolta dell'acqua piovana contribuisce alla food security delle comunità coinvolte.

Abstract

The region of Corridor Seco, Guatemala, is facing a severe food crisis caused by extreme weather events, land degradation phenomena and water scarcity. In this situation, the adoption of Rooftop Water Harvesting systems can effectively support local livelihoods, especially in marginalised communities. We present a Participatory Design approach, realised with local population, to improve water harvesting systems damaged in the last 3 years. Taking advantage of local materials and construction style, "Soberanos" project managed to realise 23 new cisterns, all functioning after the first rainy season. Extended results showed how water harvesting can effectively increase food security in the region.

Keywords

Water Scarcity, Participation, Diagnostic Analysis, Adobe bricks, Clay plaster

Introduction

Water Harvesting (WH) is worldwide recognized as an effective mean to deal with water scarcity (Rockstrom & Falkenmark, 2015). It allows the collection and storage of rainwater, floodwater or

quick runoff and their conversion to productive uses, ensuring water availability for domestic and agricultural use, enabling a lower exploitation of the aquifer, preventing erosion events and providing significant ecosystem services.

Among all existent techniques, Rooftop Water Harvesting (RWH) plays a crucial role, since it is one of the most common alternative sources of water for domestic consumption, to such an extent that it is almost the only source of water supply in many arid areas of the world (Bailey, et al., 2017). RWH is a low-tech, simple and affordable tool that can be easily conformed both to urban and rural areas (Worm &van Hattum, 2006), significantly increasing the adaptability of smallholder farming systems to extreme weather events and to climate changes, by providing a more stable access to water resources.

The region of Corridor Seco, situated in the south-eastern part of Guatemala, is characterized by erratic and unreliable rains that, joined to extreme events and a low annual rainfall amount caused a drastic condition of food and water scarcity in last twenty years. In 2001, a 40-day drought destroyed corn and bean crops in the municipalities of Camotán, Olopa and Jocotán, officially causing 48 deaths. Furthermore, in 2017 between 120,000 and 400,000 families suffered of the risk of famine and drought (Wirtz, 2017). Thus, in such context, RWH can successfully represent a vital strategy to cope with water scarcity.

To face this increasingly critical situation, in 2013, the project "Accesso alla risorsa idrica con tecniche appropriate e sostenibili nelle comunità rurali guatemalteche del Municipio de Jocotán del Guatemala per garantire la sovranità alimentare e combattere la denutrizione infantile" – "Improving water access with appropriate and sustainable techniques in the Guatemalan rural communities of the Municipio de Jocotán of Guatemala to guarantee food sovereignty and combat child malnutrition", funded by Water Right Foundation and implemented by AUCS NGO, Mani Tese NGO ONLUS and GESAAF Department of University of Florence, realised the installation of 34 household RWH systems in the municipality of Camotán. These structures, composed by a rooftop collection system connected with an underground tank, were realized to meet the needs of rural families whose only source of water supply consists of few, overexploited, springs. The project had the multiple objective of improving access to food and nutrition through production diversification as well as through the sensitization of local population.

The rooftops systems realized are composed by a catchment surface constituted by iron sheet roofs and by a delivery system consisting of gutters, conveying water to underground storage reservoirs. Rainwater is then employed to irrigate family gardens using EMAS pumps, an appropriate technology realized with materials available on site, already proven to be effective in areas where human progress is considerably constrained by water scarcity (Bresci et al., 2013).

The project provided good results for what concerns the acquisition of consciousness of the benefits provided by a varied and balanced diet and the awareness of the role played by family horticulture, not only for self-sustenance, but also as a mean for land re-appropriation to cope with large-scale agro-business activities.

Between 2014 and 2016, from the communications with the project responsible in Guatemala, it emerged that the upscaling of the project, represented by the realisation of around 100 new cisterns, brought inadequate results (Personal communication, November 2016), mainly due to problems related to the internal plastic coating of the cisterns.

In May 2017, "Soberanos" project, funded by the Tuscany Regional Government and implemented by Mani Tese Ong Onlus, GESAAF Department of the University of Florence and Association Santiago de Jocotán, allowed the identification of the main functioning-related problems, identified by field surveys, focus groups and interviews. Moreover, the use of Participatory Design methodology (Spinuzzi, 2005)allowed to deal with the problems that were emerged and to realize an implemented underground tank. The proposed improvements were then adopted to construct 23 new cisterns.

The present works describes the participatory process realised for the analysis of old cisterns failure and the design of a new prototype, presenting the main innovations developed, and the assessment of the status of the cisterns after the first rainy season. Insights and spaces for future research and projects are then discussed.

Materials and Methods

Study Area

The analysis was carried out in three villages in the municipality of Camotán - district of Chiquimula (Fig.1): Lantiquin (720 m a.s.l.), Dos Quebradas (1040 m a.s.l.) and Rodeo (990 m

a.s.l.). Weather data are available for Camotán (between 3 and 8 km away). The average annual temperature is 25.4°C, the minimum annual 17.9°C and the maximum 33.9°C. The annual precipitation is 940 mm with an amount of 874 mm during the wet season and 66 mm during the dry season. The innovative system was applied for 13 cisterns in Lantiquin and for 10 cisterns in Dos Quebradas, involving 35 local households. Study area shows prolonged dry spells, for which it is necessary to collect and store rainwater in the wet season for cultivations and food self-production during dry periods.

Figure 1 – Localisation of Chiquimula district - Guatemala

Participatory Analysis and Participatory Design

The research work has been conducted during a field work of 2 weeks in the area of study, involving the communities of Rodeo, Dos Quebradas and Lantinquin, where the damaged cisterns are present. In each community, a focus group discussion was held. 6 field visits were realised to analyse the failure occurred to the cisterns realised after 2013, and for each visit, a questionnaire was realised to the cistern's owner. In addition, a SWOT analysis was realised for Rodeo community, localised in the most remote and arid area of the municipalities involved in the project (Fig.1).

Figure 2 – Participatory activities carried out during the field work, May 2017, Rodeo community. Left: focus group discussion; right: Reporting of the SWOT analysis during the meeting.

The methodology of Participatory Design (Spinuzzi, 2005) was utilised to design an improved prototype of cistern, to be used for the implementation of "Soberanos" project. The methodology has originally been conceived for designing work organisation routines in Northern Europe, but it was also applied in development projects (Cole et al., 2014; Zewge et al., 2015).

The methodology is composed by three main phases:

1) *Initial exploration of work:* it involved the detailed analysis of the technology use on site, with the aim of familiarising with the context and the workflows used in the main duties. At the level of the present work, phase one was realised by the field visit to the structures and visits within the communities.

2) *Discovery process:* users and designers clarify the users' goal and agree on the desired outcome of the process. To elaborate this phase, the project group draft from both the results of phase 1, and from the SWOT analysis realised.

3) *Prototyping:* users and designers engage an iterative process to shape technological artefacts to fit with the needs expressed in Phase 2. In the framework of the project, this part was realised by designing a prototype of a new cistern and to refine the design through a pilot installation realised in Lantinquin community.

An analysis of the condition of the 23 cisterns built with the new design style has been carried out in January 2018.

Results and Discussion

The participatory analysis showed that problems were primarily linked to the degradation of the internal plastic coating, in polyethylene mesh.

SWOT analysis (Tab.1) showed that the main problems were linked to the degradation of both pumping and water storage system. The main causes of the failure of the systems were the damages to the plastic coating, given by rodents' attacks, and by the irregular terrain under the coating, that generated breakages under the pressure of the water stored.

Additional problems were caused by the presence of insects and snakes within the cistern. To cope with these issues, in the initial phase the improvement of cisterns with concrete, or a circular design style was proposed. When analysing possible threats to this strategy, concrete was judged too expensive, while circular design too complicated to be implemented at field level, given the low possibilities to operate within marginal localities in the Corridor Seco. A more elaborated participatory design approach was then engaged.

Strengths	Weaknesses	Opportunities	Threats
- Reduction of malnutrition - Increase of seed production - Possibility of selling vegetables cultivated through reservoir water - Possibility of drinking reservoir water	- Damaging of the plastic coating (due to irregular terrain, rodents attack) - Snakes and insects access the cistern -Damages at the wooden support of EMAS pumps	- Improvement of reservoirs with concrete - Circular reservoir design	- Concrete is expensive - Circular reservoir are difficult to build

Table 1 – Results of the SWOT analysis realised in Dos Quebradas municipality.

SWOT analysis, however, highlighted the positive outcomes of previous programs, including the reduction of malnutrition, the increase of seed production, and the availability of water for domestic use and horticultural production, that allowed local communities to generate income by selling vegetables. Thus, it can be affirmed that, once solved the cisterns' problems, the project approach can effectively increase food security in the region.

Participatory Design

The participatory analysis, together with the site visits at the damaged cisterns (Fig.3), allowed to carry out the "Initial exploration of work" phase. In the "Discovery process" phase, the community of the Soberanos project, namely the designers (experts from GESAAF department and Asociación Santiago Jocotán) and the users (the people from Dos Quebradas and Lantinquin), defined the main outcome of the process, namely the building of more resistant cisterns, with a regular edge (to be closed against intrusion of rodents, snakes and insects).Based on the previous phases, a prototype of improved underground tank was developed and realised in the "Prototyping phase" (Fig.4), to deal with emerged problems.

Figure 3 – Old cisterns. Left: construction in 2014. Right damaged cistern in 2017

A pyramid trunk shaped excavation was realized with base dimensions of 2.7 x 2 m and a depth of 0.50 m. To increase the volume of the cistern and to have a uniform edge for the cistern closing, with another polyethylene mesh, the maximum level was raised by constructing an adobe wall along the edges of the excavation. Adobe were realized by families in loco, using local clay and straw. The excavation was then plastered with clay and coated with a polyethylene sheet. The choice of adobe and clay coating instead of the initially requested cement one permitted to avoid rodent related problems with a more sustainable and environmentally appropriate approach, also making it possible to use local materials.

These solutions were suggested by local participants and adopted at design and implementation phase thanks to the participatory framework. Moreover, a workshop on the construction and maintenance of EMAS pumps was carried out in Dos Quebradas community, enabling people not only to construct pumps, but also to correctly operate and maintain them.

The analysis of project development stage, carried out in January 2018 showed that, since May 2017, 23 improved cisterns were realized in two communities: 13 in Lantinquin and 10 in Dos Quebradas. After the rainy season, all the cisterns are functioning, and they are used not only for irrigation of family gardens, but also for domestic use, thus providing an alternative source of water supply and an effective mean to deal with water scarcity.

Figure 4 – New cistern prototype. Left: no plastic coating, right, with coating (Photos: May 2017).

Apart from the technical realisation, within the "Discovery process" it was also highlighted that a regular monitoring of cisterns by the implementing NGO or institutions is needed. Thus, the project team recommended the adoption of a dedicated budget line for financing monitoring activities, when new project proposals will be written.

Regular monitoring is foreseen also for evaluating the overall effect of RWH in the region. Quality monitoring is needed to evaluate whether is safe to continue drinking cisterns water. In addition, further analysis is needed to assess how many cisterns will be working after the second rainy season. Finally, a cost-benefit analysis is needed to assess if the intervention is financially sustainable and how much it can positively impact horticultural crop yields and thus farmers' income, considering also that this topic represents a research gap at academic level (Rahman, 2017).

Conclusions

The present work was carried out in the framework of "Soberanos" project, funded by Tuscany Regional Government, Italy, to improve the rooftop water harvesting systems in the Region of Corridor Seco, Guatemala. An analysis of systems built between 2014 and 2016 showed how these systems failed, due to damages to the polyethylene plastic mesh used for reservoir coating, caused by the irregular soil shape and by the intrusion of rodents. A Participatory Design approach allowed

to design an improved cistern in May 2017, considering farmers' expertise and localmaterials, in particular the use of adobe bricks to enlarge cisterns and have a better sealing, and the use of clay plaster over soil for having a regular surface for the polyethylene mesh settling. In autumn 2017, 23 new cisterns were realised, and all of them are working after the first rainy season. Results also showed how the interventions of 2014, apart from structures' failure, increased the food security of local farmers. Further analysis should focus on a long-term monitoring, including water quantity, quality and agricultural production, considering also the cost-benefit analysis of the intervention.

Acknowledgements

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SESSIONE POSTER

LA COOPERAZIONE INTERNAZIONALE ALLO SVILUPPO NELLA FORMAZIONE SANITARIA IN ITALIA

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Sommario

Le figure sanitarie sono tra le più richieste in ambito di cooperazione internazionale.
Purtroppo,la formazione universitaria in ambito sanitario non prevede un corso specifico orientato alla formazione in questo campo, che invece è demandato alla formazione post-laurea o a esperienze collaterali al corso di laurea.
È stato somministrato un questionario agli studenti di medicina e infermieristica di Brescia e Pavia per esplorare le loro conoscenze, interessi e attitudini verso la cooperazione.
La nostra analisi ha confermato la carenza formativa, ma allo stesso tempo un interesse da parte degli studenti a colmare questa lacuna.

Abstract

The health personnel are among the most requested ones in the field of international cooperation.
Unfortunately, university training in the health sector does not provide for a specific course oriented to training in the field of cooperation. Specific training on health cooperation are post-graduate training or field experiences outside the degree course.
A questionnaire was administered to the medical and nursing students of Brescia and Pavia to explore their knowledge, interests and attitudes towards cooperation.
Our analysis confirmed the lack of knowledge about the international cooperation, but at the same time an interest by students to fill this gap.

Keywords:

Formazione, cooperazione, facoltà sanitarie, Italia

SESSIONE POSTER

Introduzione:

Formazione in ambito di salute globale e cooperazione internazionale in Italia:

La carenza di formazione in ambito di salute globale e cooperazione internazionale per i professionisti della salute nel regolare percorso formativo universitario, è diventata sempre più evidente negli ultimi 15-20 anni per il delinearsi di uno scenario mondiale dominato dai processi di globalizzazione, i nuovi rapporti di mercato, le migrazioni con il conseguente aumento delle disuguaglianze sociali. Ciò ha reso sempre più necessario un nuovo approccio alle problematiche di salute.

Nel 2010 è nata la Rete Italiana per l'Insegnamento della Salute Globale (RIISG) come risultato di un processo iniziato nel 2007, grazie allo stimolo dato dal progetto europeo "*Equalopportunities for health*" e dalla partecipazione attiva degli studenti in medicina a livello nazionale. Questo progetto intende ribadire l'importanza di un approccio alla salute intesa come diritto umano fondamentale fortemente connesso allo sviluppo sociale, attraverso iniziative di educazione e sensibilizzazione su queste tematiche.Il progetto mira a rendere consapevole l'opinione pubblica europea dello stretto legame tra salute e sviluppo e a responsabilizzare la comunità medico-sanitaria (medici, operatori sanitari, docenti e formatori, studenti di medicina) ad agire.
Promuove inoltre la discussione e divulgazione del paradigma di salute globale, inteso come approccio "panoramico" alla salute, in grado di coniugare teoricamente e trasporre nella pratica l'approccio dei determinanti sociali di salute, i valori di giustizia ed equità enunciati nella Dichiarazione di Alma Ata (OMS, 1978), l'analisi della crescente interdipendenza tra popolazioni e paesi legata ai processi di globalizzazione e del suo impatto sulla salute e sulle disuguaglianze in salute sia all'interno che tra i paesi (www.educationglobalhealth.eu/it/chi-siamo/equal).

La RIISG è un *network* nazionale che comprende istituzioni accademiche, società scientifiche, organizzazioni non governative, associazioni, gruppi e singoli individui impegnati nella formazione in salute globale, sia a livello universitario che di società civile.

Università e cooperazione allo sviluppo in Italia: il CUCS "Coordinamento Universitario per la Cooperazione allo Sviluppo"

Il Coordinamento Universitario per la Cooperazione allo Sviluppo (CUCS) nasce nel 2006 con le finalità di predisporre percorsi di educazione,formazione, progettazione e divulgazione scientifica nel settore dello Sviluppo Umano e Sostenibile e della Cooperazione allo Sviluppo;dare impulso

alla formazione di nuove generazioni di ricercatori, accademici e professionisti in grado di operare per lo sviluppo umano e sostenibile;costruire e consolidare Reti di competenze (orizzontali o trasversali tra Università, Organizzazioni non governative ONG, Organizzazioni internazionaliNon Profit, Imprese, Istituzioni locali e nazionali) e innovare le pratiche della cooperazione allo sviluppo attraverso la ricerca per migliorarne l'efficacia.

Gli Atenei di Brescia e Pavia sono tra i più coinvolti in ambito di cooperazione sanitaria. Brescia è sede del dottorato in Metodologie e Tecniche Appropriate nella Cooperazione Internazionale allo Sviluppo che include un curriculum formativo a orientamento sanitario che ha come obiettivo la formazione d'eccellenza di giovani da destinare, come operatori, al settore della cooperazione tecnica.(http://cetamblab.unibs.it/) e del Corso di Perfezionamento in Medicina Tropicale e Salute Internazionale, riconosciuto quale *Core Course* del Master Europeo in Salute Internazionale *TropEd*.

Pavia è invece sede del Centro Internazionale Cooperazione per lo Sviluppo (CICOPS)(http://www.unipv.eu/site/home/naviga-per/laureati/cicops.html) che ha lo scopo di promuovere la cooperazione con i Paesi in via di Sviluppo (PVS) e di stimolare i rapporti tra l'Ateneo pavese e le loro università ampliando tutte le forme pubbliche e private di cooperazione culturale, scientifica e tecnico - professionale al fine di approfondire lo studio di problemi sociali ed economici di tali paesi e di contribuire alla loro soluzione.

Nell'ambito del dottorato in Metodologie e Tecniche Appropriate nella Cooperazione Internazionale allo Sviluppo di Brescia, è nata l'idea di studiare il contesto formativo delle facoltà sanitarie con i fattori che lo influenzano e di approfondire il grado di conoscenza e di interesse in ambito di salute globale e cooperazione sanitaria degli studenti.

Obiettivi dello studio:

- Valutare gli interessi/conoscenze degli studenti in ambito di cooperazione internazionale nelle facoltà sanitarie di due Atenei del nord Italia
- Identificare i possibili fattori (sociodemografici, formativi) che possono influenzare gli interessi in ambito di cooperazione internazionale degli studenti delle facoltà prese in considerazione

Popolazione dello studio:

I questionari sono stati proposti a tutti gli studenti di medicina e scienze infermieristiche dell'Università di Brescia (1874 medicina + 1098 infermieristica) e dell'Università di Pavia (1898 medicina + 628 infermieristica), per un totale di 5498 studenti. L'Università di Pavia ha due corsi di

medicina, uno in italiano (Golgi), che conta 1315 studenti e uno in inglese (Harvey), che conta 583 studenti. L'unico criterio di esclusione è stato la rinuncia a partecipare allo studio.

Strumenti dell'indagine:

Il questionario è stato somministrato online, inviando un link via e-mail a tutte gli studenti coinvolti. Le domande erano le seguenti:

a) <u>Caratteristiche sociodemografiche e formative degli studenti:</u>

1. Sesso M F
2. Corso di Laurea frequentato: medicina Brescia, medicina italiano Pavia, medicina inglese Pavia, scienze infermieristiche Brescia, scienze infermieristiche Pavia
3. Anno di corso: 1°,2°,3°,4°,5°,6°
4. Media degli esami <27 >=27
5. Hai una borsa di studio in quest'anno accademico S N
6. Cittadinanza: italiana, europea non italiana, nord-americana, centro-sudamericana, africana, asiatica, oceanica
7. Di seguito sono elencate alcune motivazioni che riguardano la scelta universitaria. Per ciascuna di esse indica per favore quanto è stata importante per determinare la tua scelta del corso di studi che stai frequentando. (Modalità di risposta: per nulla importante=1, poco importante=2, abbastanza importante=3, molto importante=4).
    a) L'interesse per le discipline insegnate
    b) Il prestigio del titolo di studio
    c) Le possibilità di guadagno economico che il titolo di studio offre
    d) Il fatto che i miei amici avessero già scelto questo corso
    e) La vicinanza a casa
    f) La sicurezza di trovare un lavoro appena terminato il percorso di studi
    g) La tradizione famigliare

h) La volontà dei miei genitori

i) La possibilità di lavorare nell'ambito della cooperazione internazionale allo sviluppo

j) I consigli degli insegnanti della scuola superiore

8. Dove vorresti lavorare

a) All'estero in un Paese industrializzato
b) All'estero in un Paese in via di sviluppo
c) In Italia
d) Attualmente non ho una preferenza specifica

b) Cooperazione internazionale allo sviluppo in ambito sanitario:

1. Quale delle seguenti rispecchia la tua situazione attuale: (il valore associato alle risposte è segnalato accanto alla risposta)

a) Conosci la cooperazione internazionale, ti interessa e vorresti occupartene nella tua professione = 4
b) Conosci la cooperazione internazionale, ti interessa, ma non vorresti occupartene nella tua professione = 3
c) Conosci la cooperazione internazionale, non ti interessa e non vorresti occupartene nella tua professione = 2
d) Non conosci la cooperazione internazionale = 1

2. Quale delle seguenti affermazioni rispecchia la tua posizione sulla cooperazione internazionale in ambito sanitario? (il valore associato alle risposte è segnalato accanto alla risposta)

a) La cooperazione internazionale allo sviluppo svolge un ruolo molto importante in ambito sanitario e sarebbe utile l'introduzione di un corso specifico su questa tematica nel tuo programma di studi = 3
b) La cooperazione internazionale allo sviluppo svolge un ruolo molto importante in ambito sanitario, ma non tale da introdurre un corso specifico nel tuo programma di studi = 2

c) La cooperazione internazionale allo sviluppo non svolge un ruolo molto importante in ambito sanitario = 1

3. Quale delle seguenti affermazioni sui *Millennium Development Goals (MDG)*, lanciati dalle Nazioni Unite e scaduti nel 2015, ritieni completamente corretta?

a) La mortalità infantile mondiale ha avuto una riduzione di più del 50% tra il 1990 e il 2015
b) La mortalità infantile mondiale è aumentata tra il 1990 e il 2015
c) La mortalità infantile mondiale ha avuto una riduzione di meno del 50% tra il 1990 e il 2015

4. Quale delle seguenti ritieni completamente corretta sui *Sustainable Development Goals (SDG)*:

a) I *Sustainable Development Goals* sono più specifici in termini di contenuti rispetto ai *Millennium Development Goals* e sono orientati ai paesi in via di sviluppo

b) I *Sustainable Development Goals* sono più specifici in termini di contenuti rispetto ai *Millennium Development Goals* e sono orientati ai paesi occidentali

c) I *Sustainable Development Goals* sono più globali in termini di contenuti rispetto ai *Millennium Development Goals* e non sono solo orientati ai paesi in via di sviluppo

5. Hai mai avuto esperienza diretta di cooperazione internazionale allo sviluppo

a) Sì, offerta dall'Università
b) Sì, autonomamente
c) No

6. Il diritto alla salute è uno dei pilastri della Dichiarazione Universale dei diritti dell'uomo. Per quali gruppi credi sia rispettato meno in Italia il diritto alla salute in termini di accessibilità ai sistemi sanitari? (scegli due opzioni)

a) Migranti

b) Malati cronici
c) Anziani
d) Donne che desiderano effettuare interruzione volontaria di gravidanza
e) Donne che desiderano effettuare fecondazione assistita
f) Affetti da malattia mentale
g) Affetti da malattie infettive
h) Senza tetto
i) Carcerati

Analisi statistica:

I dati sono stati analizzati attraverso il *software* SPSS 21. Le variabili sono state descritte sotto forma di medie e deviazioni standard (DS) o frequenze percentuali. L'analisi ha previsto il confronto tra frequenze tra i 5 diversi corsi di studio inclusi nello studio le cui significatività sono state calcolate con il test Chi quadrato. Sono anche stati effettuati confronti tra corsi di medicina vs corsi di infermieristica e tra sede di Brescia e sede di Pavia. L'interesse per la cooperazione e la sua rilevanza sono state misurate attraverso una scala a 4 e a 3 punti, quindi sono state espresse attraverso la media dei valori e la sua DS. Le comparazioni tra diversi gruppi sono state fatte con t-test o ANOVA corretto Bonferroni. Le correlazioni tra interesse verso la cooperazione e le diverse variabili sono state calcolate attraverso il test di correlazione per variabili non parametriche (Rho di Spearman). Infine, per meglio definire i fattori che influenzano l'interesse in ambito di cooperazione sanitaria è stato costruito un modello di regressione lineare. Il livello di significatività considerato era $p<0,05$.

Risultati:

L'invito a partecipare all'indagine è stato inviato a 5498 persone (tutti gli studenti di medicina e infermieristica di Brescia e Pavia).

Tabella n.1 – Percentuale di rispondenti all'indagine

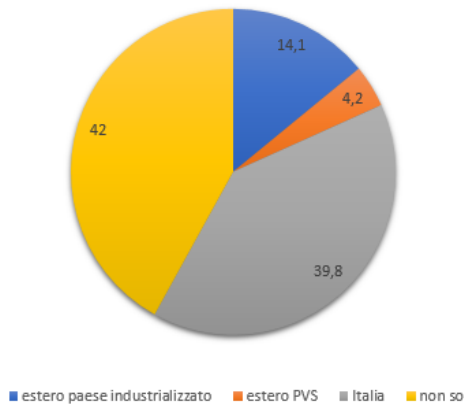
Corso di laurea	Studenti totali	Studenti rispondenti all'indagine	%

Medicina Brescia	1874	570	30,4%
Medicina Italiano Pavia (Golgi)	1315	291	22,1%
Medicina Inglese Pavia (Harvey)	583	137	23,5%
Infermieristica Brescia	1098	138	12,6%
Infermieristica Pavia	628	79	12,6%
Totale	**5498**	**1215**	**22,1%**

Tra tutti gli studenti partecipanti, solo il 4,2% ha dichiarato di voler lavorare in un PVS, con differenze significative riguardo al corso di studio (Chi quadrato=143,4; p=0,000). In particolare, si riscontra che: nel corso di medicina di Brescia solo il 3,2%, nel corso Golgi di Pavia il 3,8%, nel corso Harvey il 10,2%, nel corso di infermieristica di Brescia il 2,9% e nel corso di infermieristica di Pavia il 5,1%.

Il grafico sottostante mostra chiaramente che la maggior parte degli studenti vorrebbe lavorare in Italia oppure non sa ancora dove vorrebbe lavorare.

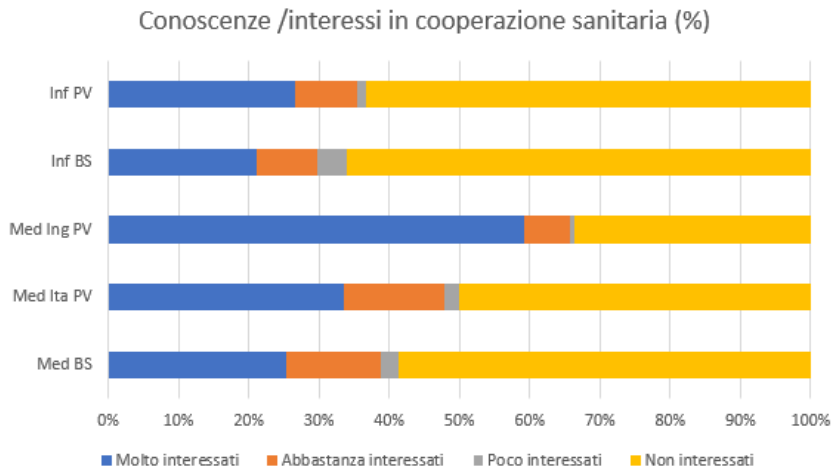
Grafico n. 1– Dove vogliono lavorare gli studenti partecipanti all'indagine



Interesse in ambito di cooperazione sanitaria:

Le domande sull'interesse in ambito di cooperazione internazionale mostrano che il 30,8% degli studenti globalmente conosce la cooperazione internazionale ed è molto interessato ad occuparsene anche professionalmente.

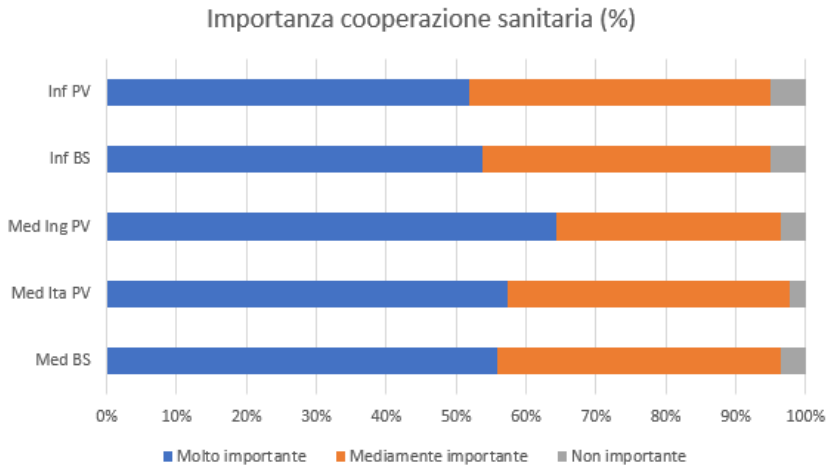
Grafico n. 2 – Interesse in cooperazione sanitaria per corso di studio



Importanza della cooperazione sanitaria:

Più della metà degli studenti (56,6%) ritiene che la cooperazione internazionale allo sviluppo svolga un ruolo molto importante in ambito sanitario e sarebbe utile l'introduzione di un corso specifico su questa tematica nel programma di studi.

Grafico n.3 – Importanza cooperazione sanitaria per i partecipanti



Fattori associati all'interesse e alla rilevanza della cooperazione sanitaria:

- Si è riscontrata una differenza di genere statisticamente significativa per quanto riguarda l'interesse e le conoscenze in ambito di cooperazione sanitaria a favore degli studenti di sesso maschile [M 2,4 (DS 1,4) vs F 2,1 (DS 1,4) con p=0,000], mentre non per quanto riguarda l'importanza della cooperazione internazionale.

  In particolare, questa differenza si è rilevata per gli studenti di medicina di Brescia rispetto a quelli di Pavia [F:2 (DS 1,3) vs M:2,2 (DS 1,4), p=0,019], ma non per gli studenti di infermieristica.
- Avere la media >=27 è risultato essere associato significativamente con un maggior interesse e conoscenza in ambito di cooperazione sanitaria [2,3 (DS 1,4) vs 2,1 (DS 1,3) con p=0,021], senza differenze tra infermieristica e medicina.
- Inoltre, gli studenti che hanno dichiarato tra le motivazioni della scelta della facoltà la possibilità di lavorare nell'ambito della cooperazione considerano la cooperazione in ambito sanitario significativamente più importante rispetto agli altri [2,8 (DS 0,4) vs 2,5 (DS 0,6) con p=0,001].Infatti, si è riscontrata una correlazione tra l'interesse in cooperazione e la scelta della facoltà basata sulla possibilità di lavorare in cooperazione (Rho di Spearman=0,34; p=0,000) e tra il ritenere importante la cooperazione e la medesima motivazione di scelta della facoltà (Rho di Spearman=0,242; p=0,000).
- Chi vorrebbe lavorare all'estero sembra in generale più interessato alla cooperazione rispetto a chi vuole lavorare in Italia, in particolare chi vuole lavorare in un PVS [3,0 (DS 1,4) vs 2,0 (DS 1,3) con p=0,000] e, allo stesso tempo chi vuole lavorare in un PVS

chiaramente ritiene più importante la cooperazione internazionale rispetto a chi vuole lavorare in Italia [2,8 (DS 0,4) vs 2,5 (DS 0,6) con p=0,001].

Per valutare i fattori che influiscono sull'interesse in ambito di cooperazione sanitaria è stato costruito un modello di regressione lineare con l'inclusione delle seguenti variabili indipendenti: il corso di appartenenza (medicina o infermieristica), il genere, la volontà di lavorare all'estero, l'ateneo di appartenenza (Brescia o Pavia).

Questo modello ha un peso del 5% sulla scala di 4 punti di interesse in ambito di cooperazione sanitaria e in particolare: chi vuole lavorare all'estero ha un interesse in media di 0,4 punti maggiore rispetto agli altri, frequentare l'università a Brescia di 0,4 punti in meno rispetto a chi la frequenta a Pavia, frequentare medicina di 0,3 punti in più rispetto a frequentare infermieristica e infine l'appartenere al genere femminile di 0,2 punti in meno rispetto ai maschi.

La tabella sottostante mostra l'influenza dei fattori inclusi nel modello sull'interesse per la cooperazione.

Tabella n.2 – Fattori che influiscono sull'interesse in cooperazione

Variabile		B	E.S.	Sign.
Costante		2,2	0,1	0,000
Genere	Femmina	-0,2	0,08	0,005
	Maschio (Rif.)	0	-	-
Ateneo	Brescia	-0,4	0,08	0,000
	Pavia (Rif.)	0	-	-
Corso di studi	Medicina	0,3	0,1	0,009
	Infermieristica (Rif.)	0	-	-
Luogo di lavoro desiderato	Estero	0,4	0,1	0,000
	Altro (Rif.)	0	-	-

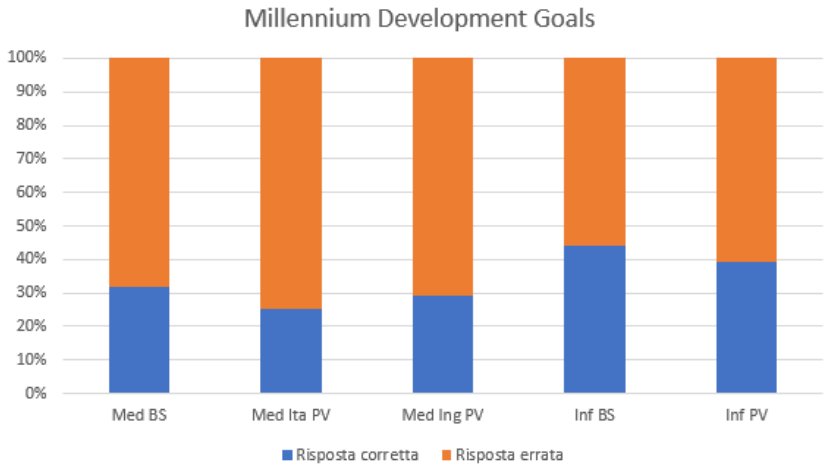
Conoscenza di salute globale:

Millennium Development Goals (MDG):

Alla domanda sui MDG, soltanto il 31,7% degli studenti partecipanti ha risposto correttamente che la mortalità infantile mondiale ha avuto una riduzione di più del 50% tra il 1990 e il 2015; mentre il

62,6% del totale ha risposto che la riduzione della mortalità infantile mondiale è stata al di sotto del 50%.

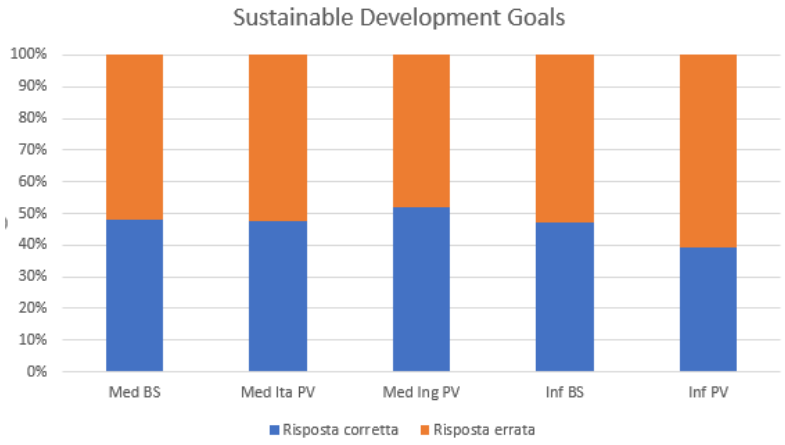
Grafico n. 4 – Risposte alla domanda su MDG



Sustainable Development Goals (SDG):

Alla domanda sulla definizione dei *SDG*, il 47,7% ha risposto correttamente che sono degli obiettivi meno specifici rispetto agli *MDG* e sono orientati non solo ai PVS, senza differenze significative tra gli studenti di medicina e quelli di infermieristica, né tra gli studenti di Brescia e quelli di Pavia.

Grafico n. 5 - Risposte alla domanda su SDG



Fattori associati alla conoscenza in ambito di salute globale:

- Non si sono riscontrate differenze significative nelle risposte alle domande sui *MDG* e gli *SDG* secondo il genere.

- Non si sono riscontrate differenze statisticamente significative tra i diversi anni di corso nel numero di studenti che hanno risposto correttamente alla domanda su MDG, né tra i corsi di medicina, né tra quelli di infermieristica. Mentre si sono trovate differenze tra diversi anni di corso in medicina ma non in infermieristica per quanto riguarda le risposte corrette alla domanda su SDG (Chi quadrato=18,9 con p=0,002; risposte corrette 1° anno: 12,6%; 2° anno: 14,1%; 3° anno: 19,5%; 4° anno: 20,1%; 5° anno: 16,8%; 6° anno: 17%).
- Analizzando globalmente la popolazione risulta che chi ha una media più bassa (<27) ha risposto più correttamente in modo statisticamente significativo alla domanda su MDG rispetto a chi ha una media più alta (35% vs 27,5%, Chi quadrato=7,7, p=0,005). Questo dato in realtà si spiega con il fatto che gli studenti che hanno data più risposte corrette sono quelli di infermieristica che globalmente hanno una media dei votisignificativamente più bassa rispetto a quelli di medicina (risposte corrette di infermieristica 42,4% vs 29,5% di medicina, chi quadrato=13,8, p=0,000).
  Tale differenza non si è riscontrata per la domanda su SDG.
- I possessori di borsa di studio hanno risposto meno bene alla domanda su SDG rispetto agli altri in modo statisticamente significativo (36,1% vs 49,7%, Chi quadrato=11,6, p=0,001), mentre hanno risposto meglio rispetto agli altri alla domanda su MDG (38,8% vs 30,5%, Chi quadrato=4,9, p=0,027).
- Gli stranieri hanno risposto meglio (al limite della significatività) rispetto agli studenti di cittadinanza italiana alla domanda su MDG (40,2% vs 31%, Chi quadrato=3,8, p=0,05), mentre non per quanto riguarda la domanda SDG.

Esperienza di cooperazione internazionale:

Solo il 7,5% dei partecipanti ha avuto esperienza di cooperazione internazionale allo sviluppo, di cui solo il 15,4% offerta dall'Università. Gli studenti di Pavia hanno avuto più esperienze di cooperazione rispetto a quelli di Brescia (10,1% vs 5,7%, Chi quadrato=8,5, p=0,014).

La tabella sottostante mostra le differenze tra diversi corsi.

Tabella n. 3 – Esperienze di cooperazione internazionale

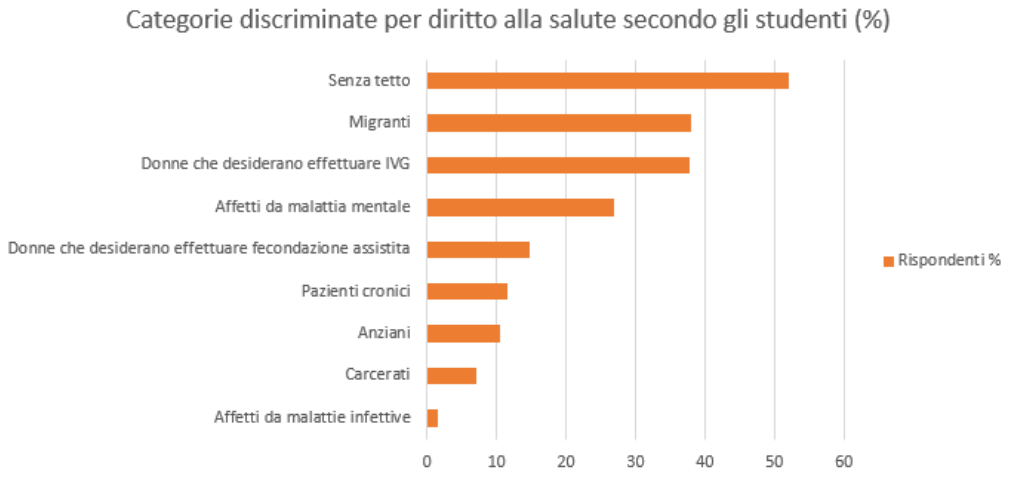
Studenti e esperienze di cooperazione pregresse			Esperienza di cooperazione			Totale
			Offerta dall'università	Autonoma	No	
corso	Med BS	Frequenza	6	28	536	570
		% entro corso	1,1%	4,9%	94,0%	100,0%
	Golgi	Frequenza	1	15	275	291
		% entro corso	0,3%	5,2%	94,5%	100,0%
	Harvey	Frequenza	5	25	107	137
		% entro corso	3,6%	18,2%	78,1%	100,0%
	Inf BS	Frequenza	1	5	132	138
		% entro corso	0,7%	3,6%	95,7%	100,0%
	Inf PV	Frequenza	1	4	74	79
		% entro corso	1,3%	5,1%	93,7%	100,0%
Totale		Frequenza	14	77	1124	1215
		% entro corso	1,2%	6,3%	92,5%	100,0%

Le categorie più discriminate per diritto alla salute secondo la percezione degli studenti di medicina e infermieristica:

Alla domanda "per quali categorie di persone il diritto alla salute è meno garantito in Italia", l'11,6% degli studenti ha risposto i malati cronici, il 10,5% gli anziani, il 37,7% ha risposto donne che desiderano effettuare interruzione volontaria di gravidanza, il 14,7% donne che desiderano effettuare la fecondazione assistita, il 26,9% gli affetti da malattia mentale, l'1,6% gli affetti da malattie infettive, il 52% i senza tetto, il 7,1% i carcerati e il 37,9% i migranti.

Il grafico sottostante mette in evidenza quali categorie secondo gli studenti dei vari corsi di studio sono più discriminate per il diritto alla salute.

Grafico n. 6 – Categorie discriminate in salute nella percezione degli studenti



Discussione dei dati e considerazioni conclusive:

La nostra analisi ha permesso di rispondere ai nostri quesiti e di avvalorare la nostra tesi.

L'interesse e le conoscenze in ambito di cooperazione internazionale nei corsi di studio sanitari dei due Atenei sono di media entità.

Il corso con una percentuale di persone più interessate è il corso Harvey di Pavia, verosimilmente per l'orientamento più internazionale, anche se non si riscontrano differenze significative di interesse in cooperazione tra italiani e stranieri appartenenti al corso.

La maggior parte degli studenti, in modo omogeneo in tutti i corsi ritiene però molto importante la cooperazione sanitaria e ritiene che sarebbe utile l'introduzione di un corso specifico su questa tematica nel proprio corso di studio. Questo non solo aumenterebbe le conoscenze in ambito di cooperazione sanitaria, ma verosimilmente anche l'interesse degli studenti.

Questo studio conferma chiaramente che lo spazio dedicato a queste tematiche è molto poco (conoscenza limitata riguardo a tematiche di salute globale) e non sufficiente a formare dei professionisti consapevoli di questo approccio alla salute.

Questa ricerca può rappresentare il primo passo per coinvolgere direttamente gli studenti e i docenti al fine di formulare delle proposte di intervento che rispondano meglio alle esigenze di formazione nel campo della cooperazione sanitaria.

Per esempio, potrebbe essere utile creare un *link* più forte tra le università che si occupano di cooperazione coinvolgendo direttamente gli studenti, ma anche, al fine di dare maggiore offerta

formativa sul campo, creare occasioni di apprendimento formale e informale su queste tematiche, sia all'interno dell'orario di lezione istituzionale, sia in momenti diversi.

Limiti dello studio:

Un limite della mia indagine è associato al fatto che non avevo informazioni dettagliate sulla popolazione bersaglio, se non la numerosità e questo non permette di stimare con sicurezza le possibili distorsioni del campione analizzato, rispetto alla popolazione bersaglio dello studio.

Un altro limite è stato sicuramente il fatto di non poter raggiungere omogeneamente tutti gli studenti per difficoltà legate all'impossibilità di un contatto diretto con gli stessi in ogni sede. L'informazione sulla possibilità di partecipare alla *survey* è passata infatti attraverso diversi canali non univoci (docenti, rappresentanti degli studenti, *social network, e-mail*). La partecipazione è stata diversa quindi nei diversi corsi di studio.

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Lista degli acronimi:

RIISG	Rete Italiana per l'Insegnamento della Salute Globale
CUCS	Coordinamento Universitario per la Cooperazione allo Sviluppo
ONG	Organizzazione non governativa
CICOPS	Centro Internazionale Cooperazione per lo Sviluppo
PVS	Paesi in via di Sviluppo

MDG	Millennium Development Goals
SDG	Sustainable Development Goals
DS	Deviazione standard
M	Maschi
F	Femmine

SESSIONE POSTER

SOLAR THERMAL PASTEURIZATION: A SIMPLE WAY TO DISINFECT WATER

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Sommario

In questo lavoro viene rivisitato un semplice sistema di pastorizzazione solare dell'acqua discusso in nostrirecentistudi dove è stato dimensionato esimulato per varie località in cui sono presenti evidenti problemi di crisi idrica. Tale modelloinclude l'intera descrizione termo-idraulica del sistema, l'analisi exergetica e il bilancio exergo-economico. In questo studio abbiamoanalizzato criticamente i risultatisimulati in termini di produttività del sistema e di costo giornaliero e medio-annuo dell'acqua per dedurne i potenziali impatti socioeconomicinei contesti proposti.

Abstract

This work is a review of a simple system for solar water pasteurisation with natural circulation discussed in our recent papers where it was designed, sized and simulated in different locations where the need for safe drinkable water was evident. Such model includes the full thermo-hydraulics, and the exergy and exergo-economic balance. In this report we critically analysed the simulated results in terms of productivity of the system and of daily and annual-average costs of purified water in order to deduce its potential socioeconomic impacts in the proposed contexts.

Keywords

Pastorizzazione; acqua potabile; energia solare; circolazione naturale, analisi exergo-economica.

Introduzione

Le crisi idriche sono considerate come uno dei principali problemi mondiali sia a livello socio-umanitario sia a livello tecnico.

Molte regioni sottosviluppate, infatti, presentano un'elevata percentuale demografica dislocata in piccoli centri rurali privi di una rete idrica e di sistemi di potabilizzazione adeguati a garantire le minime condizioni igienico sanitarie per motivi economici e di accessibilità dei mezzi di trasporto. Essi infatti sono costosi e richiedono molta manutenzione oltre che il consumo massivo di reagenti chimici.

A causa di queste condizioni di vita, milioni di persone muoiono ogni anno entrando in contatto con agenti patogeni trasportati dall'acqua (Duff, Hodgson 2005). Purtroppo, sono soprattutto i bambini a risentire di questa grave situazione sanitaria in quanto, ad oggi,malattie come la diarrea sono la seconda causa di morte infantile nel mondo e sono principalmente dovute a virus che entrano in contatto con l'uomo a causa di consumo di acqua non potabile (WHO).

In questo contesto, impianti di pastorizzazione ad energia solare potrebbero contribuire al superamentodel problema in quanto sono in grado di eliminare facilmente gli agenti patogeni in modo semplice, economico e sostenibile perché alimentati dalla sola energia solare, principale risorsa che solitamente è abbondante nelle regioni del pianeta a maggior crisi idrica.Queste caratteristiche si contrappongono a quelle di soluzioni più *Hi-tech* come l'osmosi inversa (RO)che consiste nel pompaggio di acqua verso membrane porose in grado di trattenere i patogeni contenuti al suo interno; questo tipo di impianti è solitamente piuttosto energivoro e richiede l'utilizzo di elettricità che, nel contesto in esame, può essere fornita da moduli fotovoltaici (Shen et al 2016,Alsheghri 2015).

In questo lavoro viene presentata un'analisi energetica, exergetica ed exergo-economica di un sistema di pastorizzazione dell'acqua a circolazione naturale(Dainelli et al, 2017); in primo luogo è stato dimensionato per garantire le condizioni di disinfezione dell'acqua, dopodiché le sue performance sono state modellate in condizioni ambientali fuori progetto(Dainelli et al, 2017).Tutto questo al fine di valutare quale potrebbe essere l'impatto benefico e i difetti di questi sistemi in diversi paesi del mondo affetti dalle problematiche sopra citate, da vari punti di vista. Il sistema in esame (Dainelli et al, 2017) è rappresentato in Figura 1:

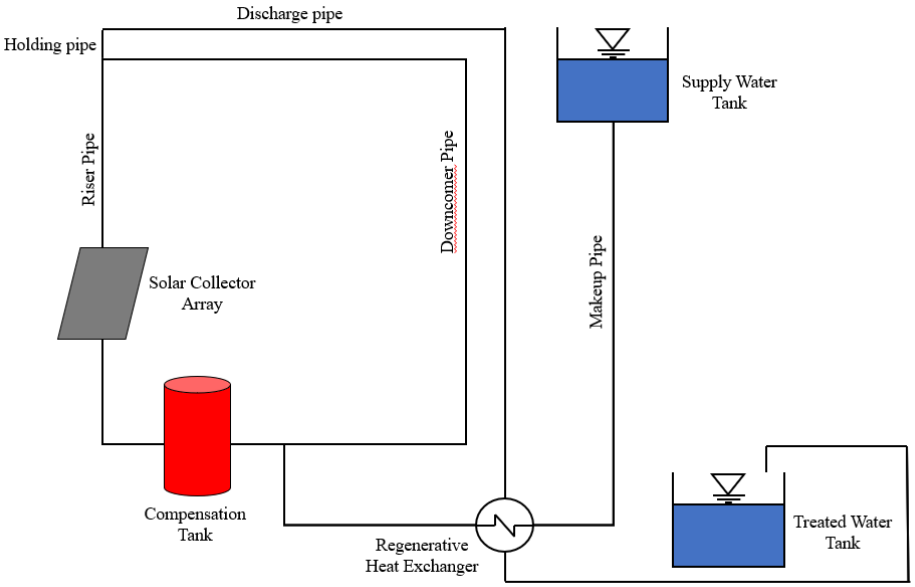

Figura 1 - Schema di impianto del Pastorizzatore a energia solare

La filiera di trattamento partedel serbatoio "*Supply Tank*" e prosegue attraverso il "*Makeup Pipe*" verso uno scambiatore di recupero del calore dall'acqua trattata in uscita. Dopodiché, all'internodi un circuito di riscaldamento, l'acqua entra in un vaso di espansione il cui volume consente di aumentare la portata di acqua in uscita e quindi, per continuità, anche di quella in entrata a temperatura ambiente evitando l'ebollizione all'interno del circuito stesso.

Il passaggio successivo dell'acqua prevede l'ingresso in una stringa di collettori solari termici piani dove si riscalda; il calore utile rappresenta la forza motrice del fluido in quanto determina una dilatazione termica che consente all'acqua di innalzare la propria altezza geodetica oltre il valore iniziale e quindi di chiudere il circuito.Una temperatura di set-point è stata impostata a 85°C perché in tali condizioni la morte dei microorganismi richiede un tempo di esposizione di soli pochi secondi (Burch et al,1998).

Il fenomeno della circolazione naturale viene anche utilizzato per evitare che acqua non disinfettata esca dall'impianto mettendo a rischio la salute dei suoi consumatori. Infatti, essa risale attraverso il "*Riser Pipe*" fino alla quota del pelo libero iniziale, livello che è in grado di superare grazie alla sua dilatazione termica.

Questo consente al volume in eccesso di entrare nell' "*Holding pipe*" e, se la temperatura è di 85°C, di sfiorare nel "*Discharge pipe*" verso il *Treated Water Tank*. L'acqua restante torna al punto

iniziale attraverso il "*Downcomer Pipe*" dove si miscela con la portata in ingresso che, per il Principio dei vasi comunicanti, è uguale a quella in uscita. Questo circuito è percorso più e più volte fino a che la radiazione non è troppo bassa da arrestare il flusso d'acqua.

Metodologia

Dimensionamento dell'impianto

Come anticipato nell' Introduzione, il principale componente che permette il funzionamento del sistema è il collettore solare; è stato adottato un modello commerciale (TVPsolar) di cui, resi noti i parametri costruttivi, possiamo calcolare l'efficienza con l'equazione di Bliss del secondo ordine:

$$\eta_{SC} = C_0 - C_1 \frac{\Delta T_m}{G} - C_2 \frac{{\Delta T_m}^2}{G} \quad (1)$$

Dove C_0, C_1 *e* C_2 sono forniti dal produttore e ΔT_m è la differenza fra la temperatura media dell'acqua e quella ambiente.

Il dimensionamento del circuito consiste nella soluzione delle seguenti equazioni al fine di ricavare la portata di progetto $\dot{m}$, la costante del circuito*k* e il diametro *D* delle tubazioni, fissata la temperatura di *setpoint* T_3 a 85°C (Dainelli et al., 2017):

$$\dot{m} C_P (T_3 - T_2) = \eta_{SC} G A_{SC} \quad (2)$$

$$\Delta P = gH(\rho_2 - \rho_3) \quad (3)$$

$$\Delta P = k\,\dot{m}^2 \quad (4)$$

Dove:

- (2) rappresenta il bilancio termico nei collettori;
- (3) rappresenta la forza motrice che permette al fluido di circolare nell'impianto, ovvero la sua variazione di densità ρ; *H* è invece la differenza di quota geodetica dell'impianto.
- (4) rappresenta la resistenza per attrito dei tubi che deve essere vinta dalla forza motrice e k è una costante caratteristica del circuito ottenuta a partire dalla somma delle perdite di carico.

Dopodiché è necessario dimensionare l'"*Holding pipe*" in modo che l'acqua possa sfiorare solo se disinfettata; definita la sezione A_{HP}, la sua altezza è calcolabile con (5)(Dainelli et al., 2017):

$$\Delta z_{HP} = \Delta z_{85°} = \frac{\Delta V_{85°}}{A_{HP}} = \frac{m}{A_{HP}}\left(\frac{1}{\rho_{85°}} - \frac{1}{\rho_{20°}}\right) \quad (5)$$

Dove m è la massa d'acqua nel sistema.

I dati di partenza sono riportati in Tabella 1(Dainelli et al., 2017):

Parametri di dimensionamento					
C_0	0.78	C_1	1.75 W/(m^{2}K)	C_2	0.00625 W/(m^{2}K^2)
T_{amb}	30 °C		1000 W/m^2	A_{SC}	2·1.95 m^2
L/H	5.3		1.5 m	D_{HP}	0.15 m

Tabella 1 – Parametri del dimensionamento

Simulazione in off-design

Il dimensionamento è stato fatto per condizioni ambientali standard, diverse da quelle operative del sistema; per cui è importante testare le prestazioni del sistema in condizioni più reali possibili con un modello matematico che abbia come input i dati di dimensionamento e parametriclimatici forniti da Meteonorm (http://www.meteonorm.com/) e come output la portata di acqua potabile prodotta.

L'analisi viene effettuata con un intervallo temporale variabile calcolato da (6)(Dainelli et al., 2017):

$$\tau_i = \frac{L}{V_{av,i}} \quad (6)$$

Dove Lè la lunghezza del circuito e $V_{av,i}$è la velocità media del fluido.

La portata prodotta è data quindi da (7):

$$\dot{m}_{MU,i} = \frac{\rho_i}{\tau_i}\Delta V_i = \frac{\rho_i}{\tau_i} m \left(\frac{1}{\rho_i} - \frac{1}{\rho_{85°}}\right) \quad (7)$$

Scelta dei siti di installazione

I potenziali siti di installazione del sistema sono stati scelti sulla base della presenza di problemi idrici realmente esistenti:

- Manila: su una popolazione nelle isole Filippine di 101 milioni di abitanti, 9 milioni consumano acqua non sicura e addirittura 19 milioni non hanno accesso a un sistema sanitario avanzato (water.org).
- Aden: in Yemen oltre il 50% della popolazione deve lottare ogni giorno per trovare o comprare acqua a scopo potabile o agricolo, e gran parte di essa riesce a farlo esclusivamente grazie ad aiuti esterni; inoltre il 70% della popolazione vive in zone rurali del tutto isolate, ma anche nella capitale Sana'a solo il 40% della popolazione è collegata al servizio idrico che comunque ha delle perdite che raggiungono il 60%. Utilizzare e depurare acqua piovana sarebbe una soluzione per rimuovere il problema della siccità ma anche delle guerre, che per il 70% riguardano l'acqua (Ward, C., 2015)
- Johannesburg: il Sudafrica è un paese semi-arido ma rappresenta comunque uno dei più industrializzati del continente Africano, per questo numerose opere di adduzione dell'acqua dai più grandi bacini presenti, come quello del fiume Orange, sono state realizzate nel corso degli anni. Tuttavia, il cambiamento climatico sta peggiorando sempre più la situazione idrica e ancora nei villaggi rurali il 19% della popolazione non ha accesso all'acqua, mentre nei centri urbani più del 26% delle scuole e il 45% degli ospedali sono isolati dal servizio idrico (UN Water. Water a Shared Responsibility, 2006).
- Nairobi: la Nigeria è il paese africano caratterizzato da maggiore densità demografica con una popolazione di oltre 174 milioni di abitanti, di cui 57 milioni (37%) non ha accesso all'acqua potabile e 60,000 bambini sotto 5 anni muoiono ogni anno di diarrea, e il costante aumento demografico porterà questa condizione a peggiorare irrimediabilmente (wateraid.org).

- Larnaca:Cipro è oggi il paese dell'Unione Europea più affetto da problemi di siccità con un indice di stressi idrico
- di oltre il 40%, dove 20%-40% è classificato come medio-alto (Sofroniou et al.,2014).
- Pantelleria e Brindisi:l'Italia, a differenza dei precedenti paesi,può essere considerata come un paese in cui la crisi idrica è meno grave; numerosi casi specifici di mancato approvvigionamento dell'acqua si sono verificati però, soprattutto in alcune regioni meridionali e nelle isole, nei periodi più caldi dell'anno.

Analisi exergetica

L'analisi energetica è molto utile per valutare il corretto funzionamento dell'impianto e la sua effettiva produttività ma nessuna informazione è fornita però sulle irreversibilità e le inefficienze interne al processo.Quindi un'analisi exergetica è consigliata al fine di fornire un quadro più completo del funzionamento dell'impianto.

L'exergia è definita come il massimo lavoro ottenibile da un sistema sulla base della sua interazione con l'ambiente esterno e può essere calcolata con(8) (Szargut,et al, 1965).

$$\dot{E}x_j = \dot{m}_j\left[\left(h_j - h_o\right) - T_o\left(s_j - s_o\right)\right] \quad (8)$$

Dove$\dot{E}x_j$ rappresenta il rateo di exergia, $\dot{m}_j$ la portata massica, h_j l'entalpia e s_j l'entropia relativi al flusso j; h_o, T_o e s_o sono invece relative all'ambiente.

In generale possono esistere due tipi di inefficienze: le perdite e le distruzioni di exergia.

Le prime sono legate a un trasferimento di exergia dal sistema verso l'ambiente e possono essere viste come irreversibilità esterne, le seconde sono dovute a irreversibilità in scambi termici o in attriti e miscelazioni e sono per questo considerate come delle irreversibilità interne al componente.

Alla luce di queste definizioni, è possibile calcolare un rendimento exergetico, oltre che energetico, dell'impianto con (9) (Bejan, 1996):

$$\eta_x = \frac{\dot{E}x_{out}}{\dot{E}x_{in}} = 1 - \frac{\Sigma\dot{E}x_D + \Sigma\dot{E}x_L}{\dot{E}x_{in}} \quad (9)$$

Analisi exergo-economica

Per la definizione di exergia, essa può essere considerata una variabile indicatrice della qualità dell'energia stessa; nel caso specifico, trattandosi di energia termica, una maggiore qualità significa una temperatura più alta che, secondoCarnot, rende una macchina termica in grado di produrre maggiore lavoro alle stesse condizioni ambientali.

Per cui è evidente che un vettore energetico con maggiore contenuto di exergia abbia anche un valore economico maggiore; in altre parole il costo può essere allocato sull'exergia calcolandone un valore specifico con (10) (Bejan, 1996):

$$c_j = \frac{\dot{C}_j}{\dot{E}x_j} \quad (10)$$

Dove c_j è il costo specifico per unità di exergia [€/J], $\dot{C}_j$ è il rateo di costo [€/s] e $\dot{E}x_j$ è il rateo di exergia [W] relativi al flusso j.

L'analisi exergo-economica consiste nell'effettuare un bilancio di costi in ingresso e in uscita da ogni singolo componente considerandone anche quelli di investimento $\dot{Z}_k$[€/s] (Bejan, 1996) al fine di calcolare il costo dell'acqua prodotta per unità di exergia:

$$\sum_{out} \dot{C}_{out,k} + \dot{C}_{w,k} = \dot{C}_{q,k} + \sum_{in} \dot{C}_{in,k} + \dot{Z}_k \quad (11)$$

$$\sum_{out} (c_{out} \dot{E}x_{m,out})_k = \sum_{in} (c_{in} \dot{E}x_{m,in})_k + \dot{Z}_k \quad (12)$$

Nel caso specifico è stato fatto un bilancio a livello integrale nell'arco di ciascun giorno medio mensile, ovvero i valori dei costi e dei contenuti exergetici sono stati espressi su base giornaliera (Dainelli et al.., 2017).

Risultati

Secondo i criteri di dimensionamento precedentemente illustrati, le variabili sono state calcolate e riportate in Tabella 2(Dainelli et al., 2017):

Risultati del dimensionamento					
D	0.02 m	L	8 m	$\dot{m}$	0.0255 kg/s
Δp	360 Pa	K	552000	η	0.692
z	2.7 kW	A_{HP}	0.785 cm^2	Δz_{HP}	0.147 m

Tabella 2 - Risultati di dimensionamento

Una volta inseriti questi risultati nel modello, quest'ultimo è in grado di predire la produttività del sistema. A questo proposito, Figura 2 rappresenta la portata d'acqua prodotta nel giorno medio di maggio per ogni località citata, andamento rappresentativo anche per gli altri mesi. Per chiarezza grafica, i risultati relativi a Brindisi e Pantelleria, che mostrano un analogo andamento, non sono illustrati ma saranno riportati solamente i risultati globali.

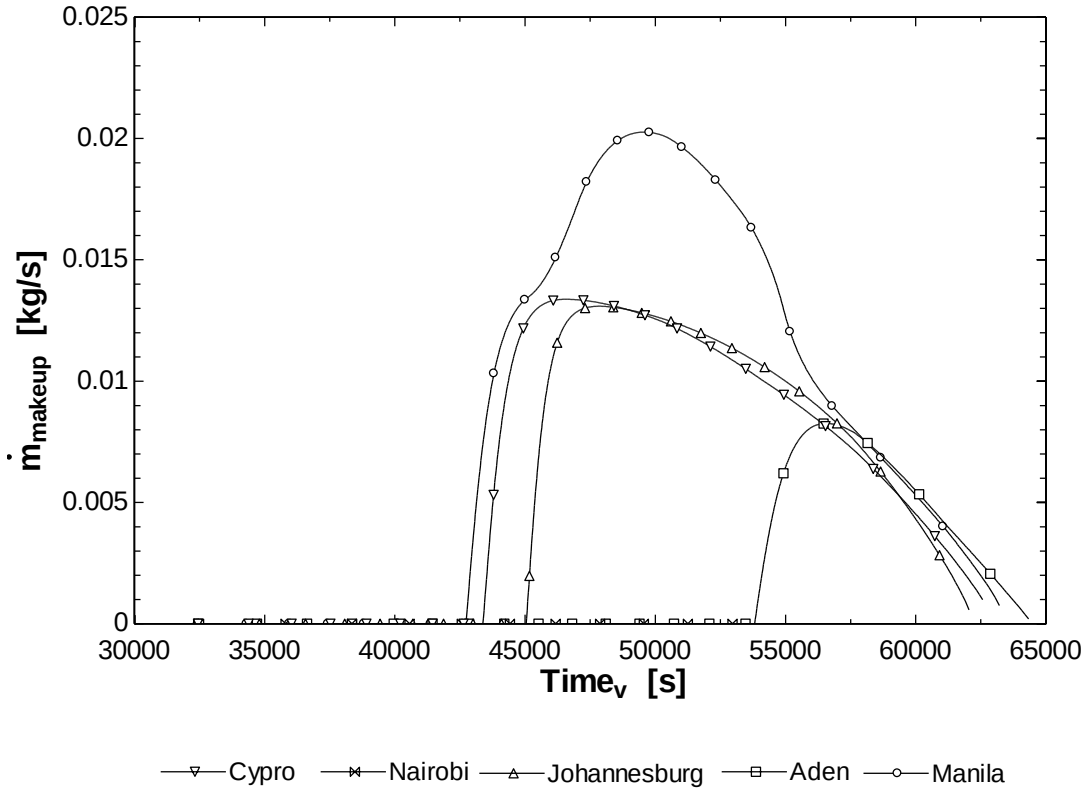

Figura 2 - Produzione di acqua nel giorno medio diagosto

Essa evidenzia un picco di produttività corrispondente al momento di maggior irraggiamento e una forte dipendenza dalla latitudine: è evidente che a Manila (Filippine), l'irraggiamento sia molto più elevato che ad altre latitudini e che questo permetta di produrre un maggior volume di acqua rispetto alle altre località.

Tale dipendenza rende necessario espandere l'analisi su un intero anno solare per considerare la variabilità stagionale delle condizioni metereologiche; il risultato di questa operazione è riportato in Tabella 3, con la produzione annuale di acqua potabile in ciascuna località:

*(Dainelli et al., 2017)

	Manila	**Aden**	**Johannesburg**	**Nairobi**	**Brindisi**	**Pantelleria**	**Larnaca**
	kg	**kg**	**kg**	**kg**	**kg**	**kg**	**kg**
Totale*	48792	106353	56819	41961	28341	28347	59525
N persone	66	145	77	57	38	38	81

Tabella 3 - Produttività della pastorizzazione

A differenza di quanto vito in Figura 2, le condizioni globali di irraggiamento fanno in modo che la maggior produttività non sia a Manila ma bensì ad Aden.

Assumendo un consumo idrico a scopo potabile di 2 litri al giorno, è stato analizzato il numero di persone che, secondo i calcoli, possono essere servite da un singolo sistema di pastorizzazione e questi risultati sono anche essi riportati in Tabella 3.

I risulti mostrano che la potenzialità di questo sistema è in grado di soddisfare i bisogni di piccoli centri rurali dove spesso è concentrato il problema della siccità e non sono richiesti sistemi in grado di produrre una portata d'acqua così elevata come nei grandi centri urbani. Per cui la diffusione su larga scala è fortemente consigliata nei paesi affetti dal problema dell'accesso all'acqua potabile e dove si riscontra un'alta percentuale di casi di malattie legate alla qualità batteriologica dell'acqua.

L'analisi exergetica permette il calcolo delle perdite e distruzioni exergetiche: da Figura 3 si capisce che queste sono presenti soprattutto nel collettore solare termico, mentre i valori calcolati nelle altre parti dell'impianto sono quasi del tutto trascurabili.

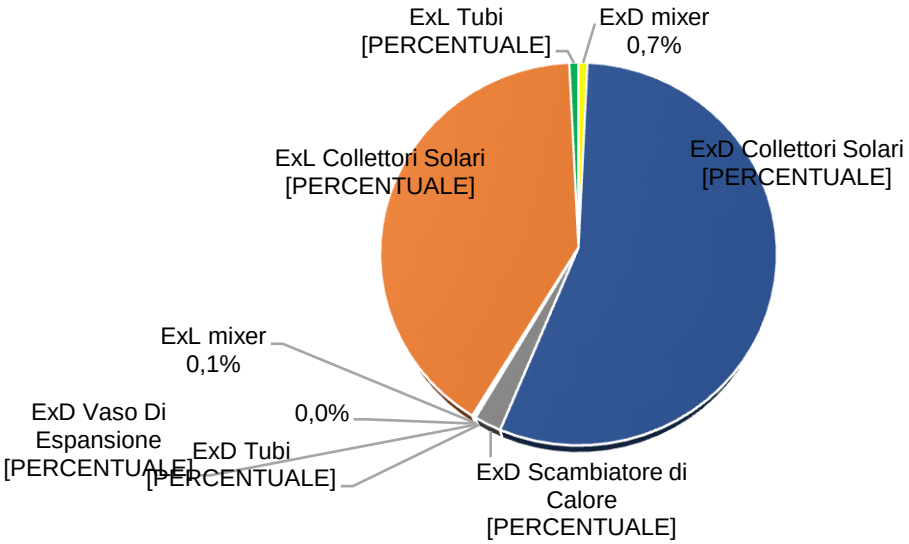

Figura 3 - Distruzioni exergetiche dei componenti

Vista l'ideale collocazione di questi sistemi in villaggi rurali affetti da gravi problemi di caratteresocioeconomico, è particolarmente importante che il costo dell'acqua prodotta sia più sostenibile possibile in rapporto alle sue prestazioni.

Per questo il primo passo dell'analisi exergo-economica è la valutazione dei costi di investimento dei componenti, attualizzati considerando un tasso di interesse del 9% e 15 anni di ammortamento (13), sulla base dei valori commercialmente disponibili (Dainelli et al., 2017).

$$Z_k^{an} = \frac{ir(1+ir)^n}{(1+ir)^n - 1} Z_k \quad (13)$$

Il costo maggiore è sicuramente legato al collettore solare piano in cui sono illustrati i valori totali e percentuali, pari ad oltre il 40%; sono stati stimati costi di installazione ma non di manutenzione in quanto trascurabili per la semplicità dell'impianto; i prezzi dei componenti sono stati ottenuti da un'analisi di quelli commercialmente disponibili.

Poiché il modello matematico descritto nel precedente paragrafo consente il calcolo del numero di ore operative nell'arco dell'anno e del giorno medio di ogni mese, è possibile ricondurre i costi totali calcolati con l'eq.(13) a valori giornalieri.

Dalla scrittura dei bilanci di costo per ogni componente (12,13) e dalla scrittura di N-1 equazioni ausiliarie laddove il componente presenti N flussi in uscita, possiamo risolvere il sistema lineare per calcolare il costo specifico dell'acqua trattata.

Dal momento però che l'obiettivo finale dell'impianto non è quello di produrre energia ma acqua, si preferisce valutare il costo su 1kg di acqua piuttosto che sull'unità di exergia.

Per valutare ed interpretare i risultati ottenuti è possibile fare un confronto con i costi specifici di un impianto a più alto livello tecnologico, come un sistema a osmosi inversa fotovoltaica (PVRO).

La qualità del prodotto di un impianto a RO, la cui vita utile è stata fissata a 15 anni, è superiore in quanto non solo disinfetta l'acqua da microorganismi patogeni, ma è in grado anche di intercettare solidi o perfino desalinizzarla; tuttavia per evitare l'ostruzione delle membrane che la costituiscono è indispensabile una filtrazione a monte dell'impianto.

In questo caso i costi di impianto riguardano l'accumulo d'acqua (25%), i pre-trattamenti (10%), i costi dei componenti per l'osmosi inversa (25%), di cui il 30% è attribuibile alle membrane (Bilton,2011) e i costi di installazione e di manutenzione (35%); a questi costi devono essere sommati quelli dei componenti elettrici (batterie, inverter, cablaggio e materiali di supporto), valutato senza incentivi 1.5 €/W_{picco}(irena.org).

I risultati medidell'analisi exergo-economica dei due sistemi sono riportati in Tabella 4:

No.	Località	Manila (Filippine)	Aden (Yemen)	Johannesburg (Sud Africa)	Nairobi (Kenya)	Brindisi (Italia)	Pantelleria (Italia)	Larnaca (Cipro)
1.	**Coordinate***	**14.52°N 121°E**	**12.83°N 45.03°E**	**26.13°S 28.23°E**	**1.3°S 36.75°E**	**40.65°N 17.95°E**	**36.82°N 11.97°E**	**34.88°N 33.63°E**
2.	**Radiazione Solare annuale, MWh/(m^2year)***	1.818	2.244	2.254	1.933	1.701	2.111	1.702
3.	**Produttività annuale, m^3***	48.792	106.354	56.819	41.961	28.342	28.347	59.525
4.	**Costo specifico dell'acqua - Circolazione naturale, €/m^3***	4.64	2.24	4.19	5.20	6.80	6.77	4.01
5.	**Costo specifico**	5.34	4.02	3.81	5.13	5.96	6.87	4.83

	dell'acqua - Osmosi inversa, €/m^3*							
6.	**Costo specifico dell'acqua pubblica, €/m^3**	0.26	-	0.48	0.12	0.76	0.85	1.03

Tabella 4 – Range di costi specifici dell'acqua potabile prodotta da pastorizzazione e ROPV (€/t)

I due costi sono piuttosto simili, ma sono lievemente a vantaggio del sistema a circolazione naturale per il minore impatto dell'installazione e della manutenzione; in ciascuno dei casi analizzati, la variabilità dei costi è definita dall'irraggiamento che nei mesi e nelle ore di picco consente di massimizzare la produzione e quindi di abbattere i costi specifici dell'acqua.

Evidentemente la scelta del sistema da adottare dipenderà, oltre che dai costi, anche dalle condizioni locali di installazione: per esempio a Pantelleria o a Cipro potrebbe essere più utile un impianto PVRO perché, trattandosi di isole, avranno a disposizione molta acqua da poter dissalare.

I costi, forniti dai distributori di acqua nelle reti nazionali nelle varie località0, sono riportati in Tabella 4. È evidente che se confrontiamo i prezzi dell'acqua potabile ottenuta con questi sistemi non tradizionali con quella da sistemi ormai consolidati non possono essere competitivi. I prezzi a Nairobi o Manila i costi sono molto bassi perché proporzionati ai poteri d'acquisto della popolazione locale.

Nessun dato è noto riguardo al prezzo dell'acqua ad Aden che è bagnata dal mare; uno dei problemi idrici principali dello Yemen è la capitale San'a' che, trovandosi ad oltre 2200 m sul livello del mare, ha un costo dell'acqua pari a 8.02€/m^3(Lichtenthäler et al., 2010); per cui ipotizzando analoghe condizioni climatiche ad Aden, nel caso specifico usare l'energia solare rappresenterebbe anche un sensibile vantaggio economico.

Conclusioni

In questo lavoro sono stati discussi nel dettaglio sistemi di pastorizzazione dell'acqua ad energia solare termica e sono stati confrontati con impianti di dissalazione a osmosi inversa alimentati da pannelli fotovoltaici.I sistemi in questione possono assumere particolare importanza pratica laddove, a causa di gravose condizioni socioeconomiche-sanitarie, non sono presenti impianti di

potabilizzazione delle acque e la siccità e la presenza di microorganismi patogeni è letale per milioni di persone.

Da un'analisi energetica approfondita effettuata con un modello termo-fluidodinamico del pastorizzatore è emerso che la produttività di un solo sistema è sufficiente a soddisfare le necessità idriche di piccoli villaggi rurali, o zone in emergenza climatica a causa di calamità naturali o guerre.Invece un'analisi exergetica ci consente di dedurre quali parti del sistema siano meno efficienti a causa di irreversibilità esterne o interne ai componenti e di applicare un'analisi exergo-economica per la stima del costo specifico dell'acqua prodotta. Ciò che ne emerge è che i costi dell'acqua sono confrontabili con quelli di soluzione a più alto livello tecnologico come un impianto a osmosi inversa con pannelli fotovoltaici, ma leggermente inferiori; tuttavia, anche una leggera differenza di prezzo che in località come l'Italia può apparire insignificante, possono essere invece importanti in paesi sottosviluppati.

Per questo l'analisi è stata applicata in varie zone con chiare emergenze idriche come Manila (Filippine), Aden (Yemen), Johannesburg (Sud Africa), Nairobi (Nigeria), Brindisi e Pantelleria (Italia).

Il risultato è che economicamente nessuna delle due soluzioni è competitiva con altri impianti tradizionali che fanno uso di tecnologie consolidate e immettono nella rete idrica enormi volumi di acqua, ma rappresentano l'unica soluzione in zone con caratteristiche simili a quelle sopra citate è che quindi i costi calcolati possano comunque giustificare l'investimento su questi sistemi per i suoi vantaggi a livello sanitario e sociale.Un caso particolare è rappresentato dallo Yemen la cui capitale Sana'a si trova in altura e presenta un costo dell'acqua molto elevato dovuto ai sistemi di pompaggio utilizzati.Per cui in questi casi la diffusione su larga scala di sistemi di pastorizzazione rappresentano, oltre che una soluzione tecnica utile a fornire acqua potabile dove non è disponibile, anche un modo per superare profondi problemi sociali come le malattie, la siccità o le guerre che purtroppo ancora oggi affliggono ampie zone del pianeta, ma che riguardano tutta l'umanità.

Lista degli acronimi

RO Reverse Osmosis

PVRO Photovoltaic Reverse Osmosis

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SESSIONE POSTER

EDUCATION & PARTNERSHIPS FOR TACKLING CONTEMPORARY SOCIAL CHALLENGES

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Sommario

Oggi, la comunità internazionale sta fronteggiando sfide nuove e multi dimensionali. Attori nuovi e diversi sono chiamati a proporre soluzioni innovative, assumendo un ruolo guida nella definizione degli schemi di sviluppo. In questo contesto, l'adozione dei 14 Obiettivi di Sviluppo Sostenibile dalle Nazioni Unite ha senza dubbio rappresentato un momento cruciale. Il nesso esistente tra gli Obiettivi, i temi legati alla migrazione e il ruolo dell'educazione è stato esplorato da diversi autori. Tuttavia, il tema necessita ulteriori approfondimenti, per consentire alle istituzioni educative ed al terzo settore di collaborare, affrontando il tema e condividendo buone pratiche di innovazione sociale.

Abstract

Nowadays, the international community is facing new and multidimensional challenges. Several actors are called to propose innovative solutions, taking the lead in the definition of the development patterns. In this context, the adoption of the 17 Sustainable Development Goals (SDGs) by the United Nations has certainly been seen as a crucial moment. The existing link between the SDG, migration issues and education sector has been explored by several authors. Yet, it need to be deepened in order to allow education institution and third sector to cooperate, tackling the issue and sharing good practices of social innovation.

Keywords

Sustainable Development Goals, migration, social innovation, education

Introduction

Nowadays, the international community is facing new and multidimensional challenges. Several actors are called to propose solutions, taking the lead in the definition of the development patterns. Governments and civil society, public authorities and private business are called to contribute in the set up of a new path of sustainable development and in its enforcement. In this context, the adoption of the 17 Sustainable Development Goals by the United Nations has certainly been seen as a crucial

moment, pointing out the failure of the past development policies, the need of change of perspective and the whole international community's responsibilities to improve the lives of people everywhere.

Migration in the SDGs

Migration is one of the most defining issues of this century. Rather than being a negative phenomenon per se, one should always keep in mind the strong existing relation between migration and economic development. So it does the Agenda 2030, which refers to migration, recognizing the economic value of migrants, being migration a strong tool for poverty reduction, not only for those that migrates but also for their families, community and origin countries. The relevance of the economic value of migration recognized by the UN within the Sustainable Development Goals Definition is mirrored, for instance, in SDG 8, where migrants workers are considered in relation to economic growth and adequate work conditions; while, SDG 10 stress the importance of a reduction in the cost of remittances. Rather than being a negative phenomenon, it is nor always a positive one: it can have a negative impact on development or it can reflect a situation of inequality and underdevelopment in the world we live, situations which are worth to be noted and analysed(FDFA; SDC 2017).

Migration as an issue to be addressed is reflected in several Sustainable Development Goals, as defined by the United Nations. The International Organization on Migration interestingly reads 9 out of the 17 SGD as directly connected to its mission. According to the William Lacy Swing, IOM General Director: "No longer is human mobility seen as just background context for development, or worse merely seen as a consequence of lack of development. Rather, with the SDGs, migration is an issue to act upon to enhance sustainable development". Obviously, as one could expect, IOM didn't stress the relation between the SDGs and the migration flows reaching Europe. Indeed,rather than an European emergency, it is worldwide migration that represents an emergency itself –when it comes together withhuman rights violation and inadequate living. Going back to IOMs stressed links, the goal number 3 (*ensure healthy lives and promote wellbeing for all at all ages*) is reflected by IOM in the objective of assisting vulnerable migrants and affected communities living in and around IDPs settlements in health facilities (Somalia); the goal number 4 (*ensure inclusive and quality education for all and promote lifelong learning*)can be connected to IOM action of conducting resettlements activities including teaching, cultural orientation and travel arrangements (Myanmar); the goal number 10 (*reduce inequality within and among countries*) in terms of

improving human security of vulnerable migrants by strengthening the response capabilities of governmental institutions and CSOs (Mexico) (IOM, 2017).

An interesting document regarding the strong relation between SDGs and Migration has been prepared in 2016 by Patrick Taran (GMPA – Global Migration Policy Associates) in partnership with other authors from European Universities and other agencies (Taran, 2016). It is drawn on a matrix and elements originally prepared by MihailPeleah, Programme Specialist on Green Economy and Employment, UNDP Istanbul regional Hub. The study represents an opposite exercise to the one made by IOM, but equally notable. It is, in fact, prepared to "ensure attention to migrants, refugees and displaced persons in the *implementation* of the 2030 Sustainable Development Goals" (Taran, . It aims at being considered as a useful tool for the establishment of specific actions and relevant indicators for the application of SDGs in the migration field. An example may be useful to understand the relevance of the analysis. The authors, for 14 out of the 17 SDGs, identified a set of considerations on the existing correlation (direct, indirect, causal, partial) among the main target of the SGD and the migration issue. The analysis is deepened at the sub-level of sub-objective, for which a set of explicit action referred to migrants/migration are stressed, coming along with relevant indicators and other and more specific notes. The actions are designed to achieve the goals and targets regarding migrants, potential migrants, returning migrants and in some cases also refugees and IDPs (internally displaced persons), but also those conditions which are considered as compelling migration. For the SDG N°1, *End poverty in all its form anywhere*, P. Taran recognizes the lack of a direct and causal relation between poverty and migration. The poorest people usually are not the ones that emigrate, unless they're forced by other causes, such as conflicts, or environment degradation. Yet social protection, the access to adequate and sufficient resources and the resilience capacity are considered key factors for remaining in a country. The authors go further examining the target 1.3, *Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve sustainable coverage of the poor and the vulnerable*. For this target, explicit actions referring to migrants have been identified, such as their inclusion in social protection/social security mechanisms, together with ad hoc indicator (qualitative and quantitative measures of the legal and administrative inclusion of migrants population in social protection and social security systems). Among the notes, it is stressed how social security may representcritical issues for migrants.

With the launch of the SDGs, migration has been included for the first time in the global development framework. However, the increasing flows of migrants directed towards Europe keep

representing a big challenge for European countries, from the economic, political and social point of view: an increasing amount of resources is needed to manage the migration flows; European and national decision-makers are asked to take into account both regional and national interests and perspectives; racism and discrimination are still an incumbent phenomena, emphasized by all the social implication of the economic downturn as well as by the increasing politicization of the migration phenomena. According to Eurostat, the Statistical Office of the European Union, migrations are determined by a combination of economical, environmental, political and social factors: in the migrant's origin Country (push factor) or in the destination Country (attraction factor). Traditionally, economic prosperity and political stability of the EU have been strongly drawing migrants. In the destination countries, international migrations can be useful to fill the existing gap in the labour market: however migrations alone cannot be able to invert the actual trend toward population ageing recorded in many areas of the Union (Eurostat, 2017).

Still according Eurostat, a successful integration of migrants into European society can be considered as a key driver for the maximization of the positive opportunities coming along with migration, and thus, its contribution to European Union development. Migrants' integration can be measured according to their employment situation, health, education level, social inclusion and active citizenship in the destination country (Eurostat, 2017 *bis*).

Several European policies and declaration have been drawn in this direction, better trying not only to guarantee migrants' integration in the society but also ensuring a better measurement of this, through a set of measurable indicators.

In strong contradiction with the above-mentioned pathway, towards a deeper and fruitful integration of migrants into European society, there is the fact that the so called "refugee crisis" determined the acceleration of a latent conflict between different visions of EU. On the other side the rising of extremist parties in several EU Member States, together with racist and xenophobic movement, deeply rooted in social dissatisfaction and economic crisis effects. In the recent European election, the extreme rights has risen celebrating populist slogans and anti-immigration discourse. Nationalist, anti-liberal and anti-European movements are rising all over Europe, demonstrating both the urgency of the matter as well how embedded it is in European societies (Postelnicescu, 2016)

Migration and Education: links to be further investigated

Although it may not seem immediate, the link existing between the social challenges related to the migration phenomena and the mission of Universities and the education sector is strong and polyvalent. In fact, the field of education and training has been recognized as fundamental not only for the professional life of students and young people, but also for its role in the development of individuals as members of a peaceful and diverse society.

Christian Dustmann and Albrecht Glitz (2011) found migration and education as issues extremely intertwined. They have actually investigated all the potential relations between the two areas. One contact point is, according to the authors, the fact that migration is often driven by economic reasons and considerations, which are, in turn, strongly influenced by education as the latter can be considered a wage driver. This connection can be read both ways: as lack of high level education determining low wages and, thus, representing a pushing factor towards other countries; on the other side as high level education system leading to economic development and a related wages higher average, acting as an attraction factor. Moreover, some migrants may leave its origin country solely for education reasons: an example of this phenomena, are student migrants, often attracted by the so called "learning centres", countries such us UK, Australia o Usa which offers educational product within an international market, or by the need to acquire skills (such as language or technological skills) abroad, in order to be more productive and attractive in their own home countries. Interestingly, it is also well-noted by the author that the existing links between migration and education are note exhaustive in how migration is affected by education, but it goes also in the opposite direction: indeed, migration can affect the life and educational path of those that do not migrate, in the destination countries and in the origin ones. In different measures, migration can change the skill bases of both origin and destination countries, it can affect – both in positive or negative - the levels of education so generating, in some cases, education externalities.

One of the most challenging issues for the European contemporary society is represented by the integration of refugees and migrants. Even though many links exist between migration and education, in this work we want to start exploring the one according to which the education sector and notably Universities can support migrants and refugees integration. In fact, Universities have a central role in building up open and tolerant societies, in fostering intercultural dialogue and preventing exclusion and radicalization. The initiative Science4Refugees, launched by the European Commission, is a clear example of the diverse relations existing between the academic world and the inclusion and integration needs. Science4Refugees enable talented refugees with asylum status

and a scientific background to obtain job position in universities and research centres with job vacancies, may they be internships, full-time or part-time jobs.

In its policy framework for migrants' integration[1], the EU has undertaken a series of actions related with migrants pre-departure, education, labour, basic services, social inclusion, overall coordination. As per the object of this article, the education actions part of the Integration Action Plan includes[2]: Policies (*Council Recommendation on Upskilling, EQF Revision*); Resources (Online Language learning, *Skills Profile Tool*, Exchange of practices between teachers, Toolkit for Schools, Courses for Teachers, Platform for Teachers, *Toolkit for Qualifications Recognition*, Manual on Qualification Recognition); Mutual Learning (Peer Learning on Reception, Peer Learning – UAM, *Peer Learning of Qualifications*); Funding (*Policy Network*, Erasmus + Social Inclusion).

Good practices at the local level: University programs and new partnerships

Several European and Italian Universities are working in this direction, promoting the mobility of their staff, students and trainers and supporting cross-border and cross-sector cooperation between actors working in the field of education. Creating new partnerships and setting up shared paths, Universities and other bodies working in the educational field can tackle together common challenges and offer great and innovative solutions. In this regard, it is interesting the collaboration agreement signed between IUSEFOR[3], born in 2012 to foster the cooperation between University, public administration, managers and local communities, and the Albanian Universitetii Shkodres "Luigj Gurakuqi". The agreement aims to promote skills acquisition and to foster the national excellences at an international level. The parties recognize the mutual interest in establishing,

[1] Presented in June 2016, the Action Plan on the Integration of Third Countries Nationals sets 50 actions aiming at supporting EU Member States in migrants' integration. At the following link a detail on each tool promoted is available: https://ec.europa.eu/migrant-integration/main-menu/eus-work/actions.

[2] The elements in italic represents the ongoing actions, while the others the completed ones.

[3] Training Agency of the University Institute for European Studies, founded on July 30, 1952 when, in Western Europe, we were just five years after the Marshall plan was presented to Harvard. That were years in the most acute phase of the cold war at world level, the same years in which Europe saw a ferment of ideas, hypotheses and discussions about Europeanism. The secret of these sixty-five years of life of the Institute lies in having been able to answer to specific training needs of the local and international community: an evolving service that has been continuously updated to keep up with the growing need for information, progressively renewing the techniques of training approach to the public and local realities to Europe. http://iusefor.it/about-us/

maintaining and developing several types of collaboration in education activities, within the field of European studies and European projects' designing.

Following the same logic, the University of Piemonte Orientale (UPO), within its Department of Economics and Enterprise Studies,started from 2017 to promote the "Free Mover" Call, also known ad "UP!Ong" project, whose aim is to enable its most gifted students to do a curricular internship abroad, in NGOs or SCOs selected by the project itself, both within or outside a the European Union. The activity is specifically connected to the student's personal interest, regardless the institutional exchanges already occurred under the Erasmus + Programme.

The existing connection between the education field and the need to find innovative answers to challenging social issues bring the academic debate to a broader area of research and action, known as Social Innovation. Social Innovation can be described as the trend to give sustainable solutions to social problems, determining a set of benefits for the direct beneficiaries of the solution, rather than for its creator. It is also defined as:

> "innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organisations whose primary purposes are social" (Mulgan, 2006: 146)

Universities and educational bodies can be considered as prominent actors in this field. They are, in fact, rich in resources (knowledge, expertize, information, technical skills, creativity and energy) that can be mobilized to contribute to find out innovative and sustainable solutions for social problems. Embracing this vision, the report prepared by RAND Europe entitled Europe's Societal Challenges (Stijn Hoorenset al, 2013), and commissioned by ESPAS,[4] highlight the need to stimulate innovation through strong partnerships between universities, business and financial institutions, organized around innovation ecosystem (European Commission, 2014).

At the international level, Ashoka, the world's largest network of social entrepreneurs launched the initiative *"Ashoka U",* aiming at catalysing social innovation in the higher education environment through the creation of a network of entrepreneurial students, universities departments and community leaders and believing in the need of higher education to shift from traditional to innovative approaches. Within the broader "Ashoka U" Initiative, *Change makers Campus* has been created as a community of leaders and institution working to make social innovation and change-

[4] ESPAS is the European Strategy and Policy Analysis System. More info available at: http://espas.eu/orbis/espas/

making more and more common in the higher education environment. In a few words, Ashoka challenged universities all around the world to have a social impact, empowering students and staff to be change-makers, and recognizes the designed universities as model campus-wide excellence in social innovation and change-making, committed to transforming the field of higher education. In Italy, the University of Piemonte Orientale started the process scan to become the first Change-maker Campus in Italy and in Continental Europe.

Conclusions

The SDGs certainly represent a starting point for deepening the migration issue and its intertwined links with other sector, among which surely there is the education one. Within the education sector, several actors are looking for a major role, playing social innovation rules. In order to obtain win-win dynamics, however, cooperation and collaboration is needed as well as the recognition of the added value coming from the latter.

The UPO, IUSEFOR as well as other bodies working in the field consider the establishment of international partnerships and the cooperation on crosscutting issues as corner stones. The achievement of high-level results necessarily entails the development of renewed strategic partnerships. A more structured cooperation between Third Sector organizations and Universities represents a starting point for a wider and more effective mobilization of social resources.

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Acronyms

EQF	European Qualifications Framework
ESPAS	European Strategy and Policy Analysis System
EU	European Union
IDP	Internally Displaced Person
IOM	International Organization on Migration
NGO	Non Governmental Organization
SCO	Civil Society Organization
SDG	Sustainable Development Goal
UAM	Unaccompanied Minors
UN	United Nations
UPO	University of Piemonte Orientale