

## **ABOUT THE LONG-TIME COOPERATION BETWEEN TORINO, MADAGASCAR AND COMOROS**

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The long-time cooperation history between Torino, Madagascar and Comoros began in 2008 with the project SCORE (“Supporting Cooperation for Research and Education”; Edulink Program ACP Contract RPR 118 # 36), run by DBIOS in co-operation with the University of the Comoros and the Malagasy Universities of Mahajanga and Antananarivo. The project allowed the implementation of a joint International Master degree on “Sustainable Development and Conservation of Biodiversity”, aimed at strengthening students’ capacity in surveying, monitoring and managing natural habitats.

One year later, in 2009, the University of Torino (DBIOS together with the Department of Agriculture, Forestry and Food Science, DISAFA) cooperate with the University of the Comoros and three Malagasy partners, i. e. the Universities of Antananarivo and of Tamatave and G.E.R.P. (an NGO: Groupe d’Etude et Recherche sur les Primates de Madagascar) and started Project BIRD (Biodiversity Integration And Rural Development”, ACP Science & Technology FED/2009/217077). This project contributed to further improve the professional skills and training of the Masters degree students, but also promoted capacity building at the social level, by involving local village authorities. The project supported the development and implementation of action plans on a local basis and fostered the socioeconomic development of communities. One of its most important results was to develop research field stations acting as multipurpose centres where researchers were hosted, where training and dissemination events took place and where organizational meetings of the local communities were held. We thank Prof. Giancarlo Bounous, now retired, for his enthusiastic coordination and his contribution to the many rural development actions carried on during BIRD project.

In 2013, DBIOS and DISAFA together with its Comorian and Malagasy Partners started working on Project EGALE (Gathering universities for quality in education; Edulink II Program ACP, Contract FED/2013/320-117). The project: i) strengthened local capacities in taking part to definition and implementation of national and regional agriculture and food security strategic plans by promoting a sustainable use of local products; ii) enhanced networking and expertise exchange among EU and ACP countries (such as the Comoros); iii) tailor ACP educational offers on local labour market requirements, as well as on local developmental priorities and international quality standards.

In this Junco issue the proceedings of the International Scientific Congress on “Food security and Agrobiodiversity in Madagascar and Comoros”, held on May 25-27, 2016 in Toamasina, are reported. The congress was organized and financed by the project EGALE (“Gathering Universities for Quality in Education”, ACP-EU Cooperation Programme in Higher Education EDULINK II, FED/2013/320-117) and had a great impact on the scientific community and stakeholders in Madagascar. About one hundred researchers, students and professionals participated in the event, that was organized by the “Institut Supérieur de Sciences, Environnement et Développement Durable” (ISSEDD – University of Toamasina, Madagascar), thanks to a young, enthusiastic staff. Several papers on food security were presented with a multi-disciplinary approach: agrobiodiversity and food issues were addressed through poster and oral presentations selected for their high scientific quality and their significant contribution to food security and natural resources sustainable management.

13 malagasy students presented the posters (reported in this issue) with the main results obtained by their master thesis work in Ethology - “*International Master in Sustainable Biodiversity Management and Conservation*”, a 2 years Master Joint title between the University of Torino and the University of Mahajanga.

*About the history of Torino – Comoran cooperation up to the meeting “Food Security, Agriculture and Sustainable Development in the Indian Ocean”, held on April 6-7, 2017 in Moroni.*

The long history of Torino – Comoran cooperation is presented in the book on “The butterflies of the Comoros” written by Emilio Balletto, Francesca Barbero, Luca Casacci, Hamada Chakira, Abdillah Dafiné, Ahmed Ouledi and published by Pensoft in 2015. The first connection between the Comoro Islands and zoologists working in Torino (Italy) was initiated many years ago, when Dr. Erik Domini, a medical doctor having worked for some time in those islands, donated to the Turin Natural History Museum three coelacanths obtained by local fishermen off the village of Iconi (Grand Comoro). In 1980, the Turin Museum and University jointly organized an exhibit centered on the transition of vertebrate life from water to terrestrial ecosystems. The three coelacanth ambassadors of the extraordinary biodiversity of the Comoro Islands generated a lot of general and media attention, which also helped to carry the message of how important it is to search for, as well as to look after, the full array of biological diversity (Elter, 1980).

Indeed, Comoran biodiversity is unique in the world and among the most important. Studies on the zoology and botany of these islands, however, are very few and most of them were carried out

many years ago, by foreign researchers and on a very discontinuous basis. What is worse is that most Comorians remain unaware of their natural riches, as well as of the many advantages that appropriate biodiversity conservation policies would generate for their social and economic development. The Comoran local economy has long been based on the wholesale exploitation of natural resources and no legislation for a sustainable development is effectively enforced.

Preserving the remaining pluvial forests and their biodiversity, while fostering a sustainable co-development between human society and natural ecosystems, will indeed be crucial for the future of Comoran people and for dealing with the major food security local challenge.

### **The Comoran cooperation activities**

Education and training are well known for having significant and positive impacts on health care, social and political participation, development of equal opportunities, economic growth rates, general income and productivity, as well as on benefits distribution.

The inauguration of the University of the Comoros (2003) has therefore represented a milestone event in the process of developing new local skills. Chronic insufficiencies in funding and restricted access to scientific debate, however, have limited the impact of new Higher Education Institutions (HEI). Since 2003, the Department of Life Sciences and Systems Biology (DBIOS) of the University of Torino has tried to tackle the need of enhancing the students' core skills necessary to understand Comoran biodiversity and manage natural resources, so that much needed policies for a sustainable development may be finally set out. To this effect, DBIOS co-operated with the University of the Comoros in several international projects having the aim of enhancing local capacity building in biodiversity research at the individual, institutional and social levels (see <http://www.mad.unito.it>).

In the frame of the Project **SCORE**, 15 Comoran postgraduate students were selected to attend the 2 years master courses and provided with the financial support necessary to perform a 3-months internship at public and/or private institutions committed to nature conservation and environmental protection located in the Comoro islands. Their work involved collecting data and writing a dissertation focused on particular aspects of the local biodiversity, including marine life, endemic species of plants, invertebrates, fishes, reptiles, birds and mammals.

In the frame of the project **BIRD** the multipurpose centre of Moroni (Comoros) represented a focal point for project activities, as well as for the analysis of local policies, and provided advice and policy-making support at various levels. Newly formed professionals helped local communities to

design and manage integrated development programs and ensured that project frameworks addressed the economic, social and environmental concerns of local populations.

Finally, the project **EGALE** had the general objective of fostering the development of high level training by supporting participation of Comoran candidates to PhD international programmes in the subject of endogenous sustainable development processes and food security.

An highlight event in the long time collaboration between Comoros and Italy was the scientific congress on “Food Security, Agriculture and Sustainable Development in the Indian Ocean”, held on April 6-7, 2017 in Moroni. The scientific committee of the conference was composed by Prof. Cristina Giacomini (University of Turin, Department of Life Sciences and Biological Systems, Italy), Prof. Gabriele L. Beccaro (University of Turin, Department of Agriculture, Forestry and Food Science, Italy), Prof. Harilala Andriamaniraka (Ecole Supérieure des Sciences Agronomiques, University of Antananarivo, Madagascar), Prof. Kamaliddine Afraitane (Faculté de Sciences et Techniques, University of Comoros, Comoros Islands), and Prof. Eustache Miasa (Institut Supérieur des Sciences, Environnement, et Développement Durable, University of Toamasina, Madagascar).

The conference was organized and financed in the frame of the project EGALE (“Gathering Universities for Quality in Education”, ACP-EU Cooperation Programme in Higher Education EDULINK II, FED/2013/320-117). EGALE aimed at supporting sustainable rural development in Madagascar and Comoros to achieve a good level of food security by the development of innovative tools for a high quality educational offer. In particular, EGALE focused on improving the capacity of the participant countries at both administrative and academic levels as well as improving their quality and competitiveness at international level and strengthening the profile of administrative and academic staff, with a particular focus on women participation.

About a hundred people from Madagascar, Comoros and Italy attended the conference. Oral presentations dealt with three main topics: “Agroforestry and food security”, “Biodiversity conservation and valorization”, and “Environmental education, scientific dissemination and internationalization of research”.

The five PhD students who attended the University of Torino thanks to a grant by the EGALE project attended the meeting and presented their results. Dr. Soifoini Toilibou (University of Comoros) presented a paper on the phytochemical and nutritional characterization of *Artocarpus altilis* (Parkinson) fruits, an important local resource for food security in Comoros Islands, while dr. Rakotoniaina Naivonirina Ernest (University of Antananarivo) showed the results on phytochemical characterization of *Chrysophyllum boivinianum*, a medicinal plant used by local population in

Madagascar. Dr. Solo Noè Renè (University of Toamasina) presented the results on the effects of seasonal climatic variations on phenology of litchi (*Litchi chinensis* Sonn.) in Madagascar.

Some papers showed advances on biodiversity conservation and ecology of natural resources in Madagascar and Comoros, as presented by dr. Bakri Nadhrou, dr. Andriamifaliharimanana Rado Alain, dr. Isidoro Riondato and dr. Torti Valeria. Other presentations highlighted as the international collaboration established in these years between the Indian Ocean Countries and Italy could be very important to improve scientific capacity building and quality in research and education of both, as highlighted by dr. Riondato Isidoro, dr. Rasamimanana Hantanirina, dr. Awardine Mohamed, and dr. Andriantsilavo Parsonnette Solomalala in their researches.

The 15 Comoran students who graduated in Ethology - “*International Master in Sustainable Biodiversity Management and Conservation*”, the 2 years Master Joint title between the University of Torino and the University of Comoro presented the posters (reported in this issue) with the main results obtained by their master thesis work.