A degrowth perspective on the coronavirus crisis

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Dear editors,

the coronavirus pandemic (COVID-19) has caused upheaval across the world, high death tolls among the most vulnerable, border closures, financial market crashes, curfews and controls on group gatherings, among many other devastating effects.

Despite observations that pollution and emissions have reduced (McGrath, 2020; Myllyvirta, 2020; NASA, 2020), the sudden, unplanned, and chaotic downscaling of social and economic activity due to COVID-19 *is not degrowth*. Instead, it constitutes a clear example of why degrowth is needed, as it highlights the unsustainability and fragility of our current economic system and social structure. Additionally, the various responses to COVID-19 have shown that degrowth is actually possible, because societies and states have demonstrated a remarkable ability to change their modus operandi in response to a major crisis.

This letter will consider these three points in further detail: first, how the COVID-19 crisis is by no means degrowth; second, how COVID-19 shows that degrowth is needed; and finally, why COVID-19 indicates the potential for a degrowth transformation.

This crisis is not degrowth

Just because COVID-19, like an economically triggered recession, has resulted in a downscaling of production, transport, and emissions amongst other things, this does not mean it represents degrowth. Firstly, a degrowth transformation must be planned and democratic. In contrast, the COVID-19 crisis and its responses have been mostly reactive – meaningful measures were implemented only once people started dying – and highly undemocratic, characterised by top-down policies, the enactment of emergency powers, and a murky process of bail-out decisions.

Secondly, degrowth requires a long-term commitment to the downscaling of production and consumption as well as the reorganisation of society in a sustainable and just way. What the COVID-19 crisis has thus far shown is governments' willingness to slow down the economy in the short run, but without any intention of maintaining these reduced levels of economic activity. Rather, the shutdown of most economies was delayed as long as possible to maintain growth, and it has been conducted with the explicit motivation of rebooting economic growth as soon as possible.

Thirdly, COVID-19 has so far disproportionately affected the most vulnerable in society, and not only the very old and young, as is usually assumed. Many workers who don't have the option of paid remote work must face the trade-off between risky infection at work or staying at home awaiting unpayable bills (Jones, 2020). Diabetics, many of whom also have a lower income, are at a higher risk of infection from the virus (Fisher and Bubola, 2020). Homeless people are being particularly affected by the corona crisis, as services such as food banks, soup kitchens, crisis centres and overnight shelters have been forced to close due to insufficient access to protective equipment which would allow their safe operation. Making matters worse, in some places the police have issued fines to the homeless for not maintaining social distancing (Boffey, 2020a). Even the most basic sanitation measures, such as washing one's hands regularly, becomes an impossible task for communities without access to running water, as is the case for example in central Chile (McGowan, 2020). In contrast, the rich have not struggled to access basic needs or services in the same way that the poor and marginalized have. As an example, in March, the complete Utah Jazz professional basketball team was tested immediately following a game, accounting for 20 percent of the state's total conducted tests up to that point (Harris, 2020a). The corona crisis reveals the deep socio-economic inequalities in society, the unequal access to and distribution of basic goods and services, the uneven impact of crises and the many vulnerabilities faced by large sections of the population. In life under neoliberal capitalism, money saves lives and a lack of it can kill you.

In summary, a degrowth transformation would be planned and proactively pursued, and have justice and equality at its core. As these examples - among a myriad of others - show, none of this is the case in the current situation.

COVID-19 shows that degrowth is needed

The current crisis highlights the unsustainability of our current system. If a flu outbreak due to a hitherto unknown virus can cause such upheaval throughout our social and economic systems, then we should clearly consider different and better ways to organise our societies. Our current political-economic system is indeed incapable of responding to the crisis in a just and humane way. Strikingly, the G7's recent statement on the crisis portrays 'the economy' as an equal, if not greater, priority than social well-being:

"we will work to resolve the health and economic risks caused by the COVID-19 pandemic and set the stage for a strong recovery of strong, sustainable economic growth and prosperity" (Gray, 2020)

This declaration goes to the core of the relationship between societal well-being and economic

growth: despite claims to the contrary by mainstream economists, more economic growth *does not* underpin well-being (Steinberger et al., 2020; Portes, 2020). The current pandemic has become, in this sense, "a story of life versus growth" (Steinberger, 2020). There is no such thing as sustainable economic growth. The current extractivist model has long surpassed ecological boundaries and the ways to deal with the crisis and its aftermath should not be centred on economic growth. Instead, the priorities should be inverted: the economic system that we need is one that is more resilient, just and explicitly prioritises human (and non-human) well-being over economic growth. We will explore here some of the causes of COVID-19, the structural mechanisms which have exacerbated it, and briefly consider how this could be different in a degrowth society.

Firstly, there is increasing evidence that the emergence of zoonotic diseases such as COVID-19 is connected to accelerating biodiversity loss and habitat destruction by humans (Ostfeld, 2009; Keesing et al., 2010; Vidal, 2020). Additionally, a strong case can be made that the global capitalist industrial agri-food system in particular creates conditions which enable the increased occurrence of viruses and enhances their potential to spread (Wallace, 2016; Lynteris and Fearnley, 2020). In contrast, serious biodiversity conservation and equitable agri-food systems based on agro-ecology and community-supported agriculture are part and parcel of a degrowth transformation (Bloemmen et al., 2015; Roman-Alcalá, 2017; Ruiz López, 2018). Some degrowth advocates have also argued for animal liberation more broadly (Herbert, 2020; Leitinger, 2020). Societies which effectively preserve their natural ecosystems and treat animals with more care and respect, rather than as mere commodities to be exploited, would greatly reduce the risk of pandemics such as COVID-19 (Osaka, 2020).

Secondly, the occurrence (and spread) of viral diseases like COVID-19 is greatly exacerbated by high living densities (e.g. in cities or cruise ships), inter-connected trade or industrial hubs, and/or substantial flows of tourists and business travellers (Florida, 2020). Cities have been growing in size and numbers since the agrarian revolution and have continued largely unchecked up until the present (UN, 2018). Larger and denser cities are a consequence of out-migration from rural areas due to a lack of employment opportunities, economic and transport policies that favour the centre over the periphery, and a culture which fetishizes the lifestyle and opportunities of the 'big city' (Lefebvre, 1970; Brenner & Schmid, 2015). Meanwhile, a degrowth transformation would emphasise the importance of community-based economic activity, re-prioritise essential work such as care and food growing, re-value proximity to nature, and demonstrate the possibilities for a multi-cultural, diverse, and socially rich life both within and outside of big cities (Chatterton, 2019; Fischer et al., 2017).

Thirdly, the economic fallout following the breakdown of global supply chains – notably the abrupt closing of factories in China – highlights what Gertz (2020) from the *Brookings Institute* describes as "hidden vulnerabilities". Similarly, the *Harvard Business Review* is calling for more resilient supply chains (Linton and Vakil, 2020) and *Foreign Policy* argues that big firms like Apple have been "blindsided on the supply side" (Braw 2020). It almost appears as if the business pundits and consultants are suddenly waking up to the craziness of an economic system where an iPhone requires parts from dozens of countries (Costello, 2020), where 'the cloud' is dirty (Walsh, 2014; Xiang Gao et al. 2012; Bouley, 2010) and devours a huge amount of energy to support our streaming needs, and where those pretty white boxes embody lots of exploited human labour. Degrowth proposes to re-localise a significant amount of production based on bio-regionalism (Tokar, 2019; Cato, 2011), shortening supply chains and increasing their resilience through transparency and decentralisation (Khmara and Kronenberg, 2018).

Lastly, it is true that human settlements have experienced fatal pandemics for much longer than the existence of capitalism as we know it today. However, our hyper-mobile and interconnected global capitalist societies have exacerbated the spread of COVID-19 through frequent long-distance air travel (Robertson and Joiner 2020), massive cruise ships (Rocklöv & Sjödin, 2020), and short-distance flights, for example from Denmark, Sweden and Germany to the Austrian town of lschgl for ski vacations (Karnitschnig, 2020). For now, COVID-19 has brought our hyper-mobility to a halt. We are forced to stay grounded, and maybe this is an adequate moment to reflect on why we feel compelled in modern society to be always on-the-go, from one activity to the next, or from one continent to another multiple times a year for holidays or conferences. Of course, the motivations for 'slowing down' are different for COVID-19 and for degrowth. For the former, they serve to reduce the spread of infection of a virus, while the latter is concerned with reducing global greenhouse gas emissions and preventing further environmental degradation. However, both COVID-19 and degrowth can lead us to a similar reflection: perhaps a good life can consist of spending more time in our communities, with our families and friends, creating safe spaces and solidarity networks for those in need, and moving around more slowly and mindfully.

In conclusion, be it in terms of our relationships with non-human nature, the centrality of metropolitan life, unfettered globalisation, or hypermobility, COVID-19 reveals the social and ecological unsustainability of modern society. Thus, a different way of organizing society is needed and degrowth offers many promising alternatives.

COVID-19 shows that degrowth is possible

Planning, economic regulation, limiting certain social practices, high levels of community cooperation and a slowing down of life (of course not for all, but for many), have all been responses to COVID-19. Similar measures have previously been labelled 'politically impossible' or 'unrealistic' in the context of ecological and other social crises, yet they have now become a reality across the world.

COVID-19, like many other crises, highlights the potential for transformative action (and change) when societies *decide* that the crisis at hand warrants discarding the previous bounds of normalcy. For example, the Spanish government pledged to provide a regular payment to its poorest citizens in the wake of the corona crisis, and Scotland is seriously considering a comprehensive universal basic income (UBI) (Harris, 2020b). Rent strikes have been coordinated across the United States (Lowrey, 2020), sending a clear message that shelter is more important than absentee rents. People across the world are now planning domestic summer holidays based on the assumption that plane travel is unlikely, a restriction that would have been unthinkable pre-corona but is now being accepted as common-sense. The corona crisis has not only illustrated the possibilities of radical policy proposals (e.g. UBI and rent moratoriums), but it has also shown through lived experience that shopping, traveling and working less does not cause the sky to fall in, and maybe this has provoked us to reconsider what is most important in life.

If anything, the corona crisis teaches us that our lived environments can change rapidly and drastically, but also that societal responses can be swift and prioritise the most vulnerable in society, if there is a desire. A degrowth society, generalising these principles of social justice and ecological sustainability, would reduce the probability that such crises occur in the first place, and be far more resilient to a world full of unpredictability.

From analysis to action

Given how much society has changed due to COVID-19, it is clear that the potential exists to actively reorganize society around degrowth principles, even though this would be a significantly greater task. Of course, we should be aware that there is a historical precedent for right-wing, populist, and neoliberal governments exploiting crises such as the current one to re-embed their agendas and consolidate their power. After the financial crisis of 2008-2009, these powers enacted austerity policies for the majority and bailed out the financial and insurance sector with public money (Mirowski, 2013). We can already see this scenario repeating itself, with bailouts of KLM-Air France (€10bn; Morgan, 2020a), Lufthansa (€10bn; Russell, 2020), and Renault (€5bn; Morgan, 2020b), among others.

However, there is mounting resistance against a return to the status quo and business as usual. We have seen states planning, regulating and being challenged, communities creating mutual aid networks, and individuals radically adjusting their lifestyles. We have witnessed degrowth-aligned activism, organizing and policy-making across all scales of society. The global anti-aviation network, Stay Grounded, has denounced the bailouts of an unsustainable industry with public funds, demanding national governments to "save people not planes" (Stay Grounded, 2020). In the United States, flourishing networks of mutual aid, community support and local

resilience are responses of necessity to a crisis which has disproportionately impacted people of colour. The demands of Black Lives Matter for rent cancellation and food sovereignty explicitly link the vulnerabilities revealed by COVID-19 and highlight alternative ways of meeting basic human needs (Black Lives Matter Los Angeles, 2020). In Hawai'i, the State Commission on the Status of Women (2020) has developed an explicit feminist economic recovery plan to deal with the negative effects of COVID-19. Its policy recommendations include drastic changes to the ways in which women's work is valued and compensated, and calls for the strengthening of education, childcare and healthcare programs. The municipality of Amsterdam is employing Kate Raworth's model of 'doughnut economics' to guide a post-COVID recovery which prioritizes social and ecological wellbeing rather than economic growth (Boffey, 2020b). Finally, millions of acts of cooperation, solidarity and kindness that do not make the news, but abound in our neighbourhoods and communities, testify every day that humans are not selfish, utility-maximizing individuals, but care deeply for each other and their environments.

Moreover, from within the degrowth community a strong case has been made for a post-COVID economic system aligned with degrowth principles. This took the form of an open letter that was signed by more than 2,000 degrowth academics, activists and practitioners, and appeared in media outlets all over the world (Degrowth.info, 2020). This open letter, 'New Roots for the economy: re-imagining the future after the corona crisis', outlined five key principles to tackle the crisis induced by COVID-19 and build a just and more sustainable society. The principles are as follows: (1) put life at the centre of our economic systems; (2) radically re-evaluate how much and what work is necessary for a good life for all; (3) organize society around the provision of essential goods and services; (4) democratize society; and (5) base political and economic systems on the principle of solidarity (New Roots Collective, 2020). The letter highlights the vulnerability of growth-based economies to crises (including pandemics), calls for the decommodification of health services, and highlights the potential of this crisis for society to properly value care work as well as other basic health services). We believe that the degrowth movement has a lot to offer in this moment of crisis, on the one hand in drawing the links between our unsustainable economic system and COVID-19, and on the other hand by presenting degrowth as a radically fair and more sustainable alternative based on the principles outlined above. Yet, for the movement to have a meaningful impact, it must ally and work with other emancipatory projects and social movements, going beyond diagnostics and theories towards the important, though messy work of organizing collectively and building these desired futures.

A diversity of futures is indeed constantly being shaped, contested and struggled for. Essentially, these futures will become what we, as individuals, groups, and society, make of them. So, let's get together, organise at different levels, decide collectively what a good life consists of and try to achieve this for all, humans and nonhumans alike.

We send our solidarity to everyone who needs it in this moment.

References

Black Lives Matter Los Angeles (2020, April 16). Black Los Angeles demands in light of COVID-19 and rates of black death. https://www.blmla.org/newsfeed/2020/4/16/black-los-angeles-demands-in-light-of-covid-19-and-rates-of-black-death

Bloemmen, M., Bobulescu, R., Tuyen Le, N., Vitari, C. (2015). Microeconomic degrowth: the case of community supported agriculture. *Ecological Economics*, 112, 110-115. <u>https://doi.org/10.1016/j.ecolecon.2015.02.013</u>

- Boffey, D. (2020a, March 31). Europe's homeless hit hard by coronavirus response. *The Guardian*. <u>https://www.theguardian.com/world/2020/mar/31/europes-homeless-hit-hard-by-coronavirus-response</u>
- Boffey, D. (2020b, April 8). Amsterdam to embrace 'doughnut' model to mend post-coronavirus economy. The Guardian. <u>https://www.theguardian.com/world/2020/apr/08/amsterdam-doughnut-model-mend-post-coronavirus-economy</u>
- Bouley, D. (2010). Estimating a data center's electrical carbon footprint [White paper 66]. APC by Schneider Electric. <u>https://sg.insight.com/content/dam/insight/en_US/pdfs/apc/apc-estimating-data-centers-</u> <u>carbon-footprint.pdf</u>

Braw, E. (2020, March 4). Blindsided on the supply side. Foreign Policy.

https://foreignpolicy.com/2020/03/04/blindsided-on-the-supply-side/

- Brenner, N., Schmid, C. (2015). Towards a new epistemology of the urban? *Urban City*, *19*(2-3), 151-182. <u>https://doi.org/10.1080/13604813.2015.1014712</u>
- Cato, M.S. (2011). Home economics: planting the seeds of a research agenda for the bioregional economy. *Environmental Values, 20*(4), 481-501. <u>https://doi.org/10.3197/096327111X13150367351258</u>
- Chatterton, P. (2019). Unlocking sustainable cities: a manifesto for real change. Pluto Press.
- Costello, S. (2020, March 31). Where is the iPhone made? Lifewire. <u>https://www.lifewire.com/where-is-the-iphone-made-1999503</u>
- Degrowth.info (2020, May 13). *Press release: 1,100 experts call for Degrowth as post-COVID-19 path.* Degrowth. <u>https://www.degrowth.info/en/press-release/</u>
- Euronews (2020, March 14). Immediate evacuation of migrant camps in Greece needed to contain coronavirus, says MSF. Euronews. <u>https://www.euronews.com/2020/03/14/immediate-evacuation-of-</u> migrant-camps-in-greece-needed-to-contain-coronavirus-says-msf
- Fischer, A., Holstead, K., Hendrickson, C.Y. (2017). Community-led initiatives' everyday politics for sustainability – Conflicting rationalities and aspirations for change? *Environment and Planning A*, 49(9), 1986–2006. <u>https://doi.org/10.1177/0308518X17713994</u>
- Fisher, M., Bubola, E. (2020, March 16). As coronavirus deepens inequality, inequality worsens its spread. *The New York Times*. <u>https://www.nytimes.com/2020/03/15/world/europe/coronavirus-</u> <u>inequality.html</u>
- Florida, R. (2020, April 3). The geography of coronavirus. CityLab. <u>https://www.citylab.com/equity/2020/04/coronavirus-spread-map-city-urban-density-suburbs-rural-data/609394/</u>
- Ge, M., Friedrich, J. (2020, February 6). *4 charts explain greenhouse gas emissions by countries and sectors.* World Resource Institute. <u>https://www.wri.org/blog/2020/02/greenhouse-gas-emissions-by-country-sector</u>
- Gellatley, J. (2020, February 4). *Eating animals will be the death of us*. The Ecologist. https://theecologist.org/2020/feb/04/eating-animals-will-be-death-us
- Gertz, G. (2020, March 5). *The coronavirus will reveal hidden vulnerabilities in complex global supply chains*. Brookings. <u>https://www.brookings.edu/blog/future-development/2020/03/05/the-coronavirus-will-reveal-hidden-vulnerabilities-in-complex-global-supply-chains/</u>
- Gray, A. (2020, March 16). G7 leaders to do 'whatever necessary' to fight coronavirus. Politico. https://www.politico.eu/article/g7-leaders-to-do-whatever-necessary-to-fight-coronavirus/
- Griswold, A. (2020, February 28). The cost of American health care could help coronavirus spread in the US. Quartz. <u>https://qz.com/1809382/us-health-care-costs-could-help-coronavirus-spread/</u>
- Harris, A. (2020a, March 15). It pays to be rich during a pandemic. How the wealthy, powerful, and connected are exploiting the loopholes in our health-care system. The Atlantic. https://www.theatlantic.com/politics/archive/2020/03/coronavirus-testing-rich-people/608062/
- Harris, J. (2020b, May 3). Why universal basic income could help us fight the next wave of economic shocks. The Guardian. <u>https://www.theguardian.com/commentisfree/2020/may/03/universal-basic-income-coronavirus-shocks</u>
- Hawai'i State Commission on the Status of Women (2020). Building bridges, not walking on backs: a feminist economic recovery plan for covid-19. https://humanservices.hawaii.gov/wpcontent/uploads/2020/04/4.13.20-Final-Cover-D2-Feminist-Economic-Recovery-D1.pdf?fbclid=IwAR1Twrc-SZPnZ0TPcIM3gxVxO-5AgagPb9IQIpoCdguyfH50 KyX6giqjoI
- Herbert, J. (2020, February 20). *Degrowth and animal liberation*. Degrowth.info. <u>https://www.degrowth.info/en/2020/02/degrowth-and-animal-liberation/</u>
- Jones, O. (2020, March 14). We're about to learn a terrible lesson from coronavirus: inequality kills. The Guardian. <u>https://www.theguardian.com/commentisfree/2020/mar/14/coronavirus-outbreak-inequality-austerity-pandemic</u>
- Karnitschnig, M. (2020, March 20). *The Austrian ski town that spread coronavirus across the Continent.* Politico. <u>https://www.politico.eu/article/the-austrian-ski-town-that-spread-coronavirus-across-the-continent/</u>
- Keesing, F., Belden, L.K., Daszak, P., Dobson, A., Harvell, C.D., Holt, R.D., Hudson, P., Jolles, A., Jones, K.E., Mitchell, C.E., Myers, S.S., Bogich, T., Ostfeld, R.S. (2010). Impacts of biodiversity on the emergence and transmission of infectious diseases. *Nature*, 468, 647-652. <u>https://doi.org/10.1038/nature09575</u>
- Khmara, Y., Kronenberg, J. (2018). Degrowth in business: an oxymoron or a viable business model for sustainability? *Journal of Cleaner Production*, 177. <u>https://doi.org/10.1016/j.jclepro.2017.12.182</u>

Lefebvre, H. (1970). The Urban Revolution. University of Minnesota Press.

- Leitinger, L. (2020, June 1). Degrowth and Domesecration: a Historical View on Nonhuman and Human Violence. Degrowth.info. <u>https://www.degrowth.info/en/2020/06/degrowth-and-domesecration-a-historical-view-on-nonhuman-and-human-violence/</u>
- Linton, T., Vakil, B. (2020, March 5). Coronavirus is proving we need more resilient supply chains. Harvard Business Review. <u>https://hbr.org/2020/03/coronavirus-is-proving-that-we-need-more-resilient-supply-chains</u>
- Lockwood, A. (2020, March 18). *Carnivores, coronavirus and the end of the world*. Plant Based News. https://www.plantbasednews.org/opinion/carnivores-coronavirus-end-of-the-world
- Lowrey, A. (2020, May 2). Cancel rent. The Atlantic. https://www.theatlantic.com/ideas/archive/2020/05/cancel-rent/611059/
- Lynteris, C., Fearnley, L. (2020, March 2). Why shutting down Chinese 'wet markets' could be a terrible mistake. The Conversation. <u>https://theconversation.com/why-shutting-down-chinese-wet-markets-could-be-a-terrible-mistake-130625</u>
- McGowan, C. (2020, March 23). *How do communities fight coronavirus when they don't have water*? Al Jazeera. <u>https://www.aljazeera.com/indepth/features/communities-fight-coronavirus-don-water-200322225523769.html</u>
- McGrath, M. (2020, March 19). Coronavirus: Air pollution and CO2 fall rapidly as virus spreads. BBC News. https://www.bbc.com/news/science-environment-51944780
- Mirowski, P. (2013). Never let a serious crisis go to waste: How neoliberalism survived the financial meltdown. Verso.
- Morgan, S. (2020a, April 29). Air France-KLM gets virus bailout, green conditions still pending. Euractiv. https://www.euractiv.com/section/aviation/news/air-france-klm-gets-virus-bailout-green-conditionsstill-pending/
- Morgan, S. (2020b, May 1). Renault's €5bn bailout gets EU go-ahead. Euractiv. https://www.euractiv.com/section/transport/news/renaults-e5bn-bailout-gets-eu-go-ahead/
- Myllyvirta, L. (2020, February 19). Analysis: Coronavirus has temporarily reduced China's CO2 emissions by a quarter. CarbonBrief. <u>https://www.carbonbrief.org/analysis-coronavirus-has-temporarily-reduced-</u> <u>chinas-co2-emissions-by-a-quarter</u>
- NASA (2020, March 2). Airborne nitrogen dioxide plummets over China. <u>https://www.earthobservatory.nasa.gov/images/146362/airborne-nitrogen-dioxide-plummets-over-china</u>
- New Roots Collective (2020, May 13). *Degrowth: new roots for the economy.* Degrowth.info. <u>https://www.degrowth.info/en/open-letter/</u>
- Osaka, S. (2020, July 23). Scientists unveil a plan to prevent the next pandemic (and save nature at the same time. Grist. <u>https://grist.org/climate/scientists-unveil-a-plan-to-prevent-the-next-pandemic-covid-and-save-nature-at-the-same-time/</u>
- Ostfeld, R.S. (2009). Biodiversity loss and the rise of zoonotic pathogens. *Clinical Microbiology and Infection*, 15, 40-43. <u>https://doi.org/10.1111/j.1469-0691.2008.02691.x</u>
- Portes, J. (2020, March 25). *Don't believe the myth that we must sacrifice lives to save the economy*. The Guardian. <u>https://www.theguardian.com/commentisfree/2020/mar/25/there-is-no-trade-off-between-the-economy-and-health</u>
- Robertson, C., Joiner, K. (2020, February 26). Airplanes spread diseases quickly so maybe unvaccinated people shouldn't be allowed to fly. The Conversation. <u>https://theconversation.com/airplanes-spreaddiseases-quickly-so-maybe-unvaccinated-people-shouldnt-be-allowed-to-fly-131361</u>
- Rocklöv, J., Sjödin, H. (2020). High population densities catalyse the spread of COVID-19. *Journal of Travel Medicine*, *27*(3), 1-2. <u>https://doi.org/10.1093/jtm/taaa038</u>
- Roman-Alcalá, A. (2017). Looking to food sovereignty movements for post-growth theory. *Ephemera*, 17(1), 119-145. <u>http://ephemerajournal.org/sites/default/files/pdfs/contribution/17-1romanalcala.pdf</u>
- Ruiz López, M.A. (2018). Agroecology: one of the "tools" for degrowth. *Scientia et Technica, 23*(4), 599-605. https://doi.org/10.22517/23447214.19271
- Russell, R. (2020, May 27). Opinion: Lufthansa bailout shows Germany has learned nothing from the pandemic. DW. <u>https://www.dw.com/en/opinion-lufthansa-bailout-shows-germany-has-learned-nothing-from-the-pandemic/a-53584917</u>
- Stay Grounded (2020). #SavePeopleNotPlances: Red lines for aviation bailouts. <u>https://stay-grounded.org/wp-content/uploads/2020/04/SG_Petition_ENG.pdf</u>
- Steinberger, J. (2020, April 8). Pandenomics: a story of life versus growth. Open Democracy.

https://www.opendemocracy.net/en/oureconomy/pandenomics-story-life-versus-growth/

- Steinberger, J.K, Lamb, W.F., Sakai, M. (2020). Your money or your life? The carbon-development paradox. *Environmental Research Letters*, 15(4). <u>https://doi.org/10.1088/1748-9326/ab7461</u>
- Tokar, B. (2019, September 19). *The liberatory potential of local action*. ROAR Magazine. https://roarmag.org/essays/liberatory-potential-local-action-tokar/
- United Nations (2018, May 16). 68% of the world population projected to live in urban areas by 2050, says UN. <u>https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html</u>
- Vidal, J. (2020, March 17). Destruction of habitat and loss of biodiversity are creating the perfect conditions for diseases like covid-19 to emerge. Ensia. <u>https://ensia.com/features/covid-19-coronavirus-biodiversity-planetary-health-zoonoses/</u>
- Wallace, R. (2016). *Big farms make big flu: dispatches on infectious disease, agribusiness, and the nature of science.* Monthly Review Press.
- Walsh, B. (2014, April 2). Your data is dirty: the carbon price of cloud computing. Time. https://time.com/46777/your-data-is-dirty-the-carbon-price-of-cloud-computing/
- Xiang Gao, P., Curtis, A.R., Wong, B., Keshav, S. (2012). It's not easy being green. ACM SIGCOMM Computer Communication Review, 42(4), 211-222. <u>http://blizzard.cs.uwaterloo.ca/iss4e/wpcontent/uploads/2012/03/carbon-dc.pdf</u>