JOJ Wildlife and Biodiversity

Juniper Publishers
key to the Researchers

Review Article
Volume 3 Issue 2- December 2020

JOJ Wildl Biodivers

Re-evaluating nature's innovative engineering during the covid19 pandemic Maria Kampouri

Maria Kampouri*

Remote Sensing Laboratory, School of Rural & Surveying Engineering, National and Technical University of Athens, Greece

Submission: November 11, 2020; **Published:** December 14, 2020

***Corresponding author:** Maria Kampouri, Remote Sensing Laboratory, School of Rural & Surveying Engineering, National and Technical University of Athens, Greece

Ecological Changes

The Covid-19 pandemic has a potential to re-define the relationship between humans and natural ecosystems. Epidemiologists, biologists, and historians have been well aware that the possibility of a zoonotic disease becoming a pandemic is imminent as a result of urbanization, mass transportation, intensive agriculture, the extensive use of antibiotics and airconditioning installation. However, spatial planners, engineers, and policymakers, as we have seen since the beginning of the covid-19 pandemic, have shown a lesser understanding of the factors at play. The role in policy and city planning of scientists with a biological or environmental background may have been overlooked in the past, but this may well be about to change Chin

In the time following the covid-19 lockdowns people became eager to establish how far we have come since the time of the black plague, the Spanish and the Russian flu. However, the inevitable had long been established by epidemiologists, who have been warning for decades that broad-spectrum antiviral drugs do not currently exist and that as a result of the way we live and travel, a pandemic is simply a matter of time. Epidemiology, present us with projections and models, predicting future epidemiological events. However, engineers involved in city planning and development, without a background in biology, veterinary medicine or anthropology are very likely to not have been familiar, during their basic training, with epidemiological approaches. Policymakers, similarly, seem to not be able to turn to the correct specialists for advice, as in many cased during the Covid-19 pandemic, when the group of expert advisors are led by medical doctors, as opposed to epidemiologists. For example, in Greece, almost nine months after the first covid-19 patient, a group of general practitioners, specializing in infectious diseases, constitute the advisory committee of the government on the pandemic.

Conspiracy theories of all kinds have dominated public opinion in many countries in a way that makes a chilling truth evident, internet literate generations other than lacking essential understanding of biological sciences, also seem to have lost their connection to the natural environment of their surroundings. In fact, this is further worrying in light of the widely available literature in popular science and news outlets concerning recent zoonotic disease outbreaks such as Foot-and-mouth disease (FMD) (2001, UK), swine flu (2009, worldwide), Ebola virus disease (2013, sub-Saharan Africa) avian flu (2017, China), as well as the consequences of a recombination of these diseases [1].

A shift in resolving nature-related issues has been observed in recent years from a more traditional conservationist approach to one which is innovation-based, placing the engineer, as opposed to the biologist or environmental scientist at the forefront and adopting a solution-based approach. With pressure from institutions funding research, human landscape-altering interventions, such as transformation of a forest to agricultural land or installing wind power turbines, have, in many cases, done more harm than good, leading to

devaluation in ecosystem processes. Natural ecosystems act as buffers. Zoonotic spillover happens when the buffer essentially has been trespassed or has ceased to exist [2]. Thus, it is not only wildlife trafficking responsible for spillovers, but also the way that natural ecosystems are managed and maintained.

A problem, which has been identified and addressed is that democratic space for meaningful engagement of local people in national and international decision-making about nature conservation is lacking [2]. As a result, policy development and legislation has been focusing on drawing from indigenous

knowledge but has failed to put emphasis on the infrastructure and economic pressures, which have profoundly been affecting the delivery of indigenous knowledge for many generations now. The UN General Assembly, 20171, urges policy makers to increase the capacity of local communities to pursue sustainable livelihood opportunities, including from their local wildlife resources, and eradicate poverty, by promoting, inter alia, innovative partnerships for conserving wildlife through shared management responsibilities. Similarly, the CBD Strategic Plan for Biodiversity 2011-2020 invites public authorities to respect the traditional knowledge, innovations, and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, subject to national legislation and relevant international obligations, by encouraging participatory management.

Policies aiming at employing innovation and technology with respect to the needs of indigenous communities within a setting which is very much based on economic criteria, have created a vicious circle of generating financial support to develop often short-lived. However, what is often overlooked to some degree is that prior to any intervention, ecosystem dynamics must be considered and analysed. The interconnectedness of different habitats and the vulnerability of different species need to be considered before new elements become introduced, which may benefit local communities economically in a short-term sustainable way, altogether reversed at times of crisis for the economy and tourism [3]. Many rural communities are becoming more and more alienated from their natural environment, with younger people preferring to live close to towns and cities, becoming more and more interested in service-providing job opportunities, as opposed to agriculture. Television and the internet often reach communities based in the depths of wilderness, making innovation and technology more easily acceptable and desirable to newer generations of rural communities than previously.

With our collective attention turned to the intricate network of technology-based media, as opposed to the intricate network of ecosystem organism interactions, we are in danger of overseeing the real patterns governing the natural world. As E O Wilson, pointed out already in the 1980s, the importance of mapping biodiversity is fundamental to plan its conservation and practical use [4]. Ecosystem disturbance and biodiversity loss due to changes in land use are related to the emergence of zoonotic disease worldwide. Depletion of biological resources has been linked to changing host population densities and subsequently increased pathogen diversification, causing disease spillover to humans dominating the new landscape (Figure 1).

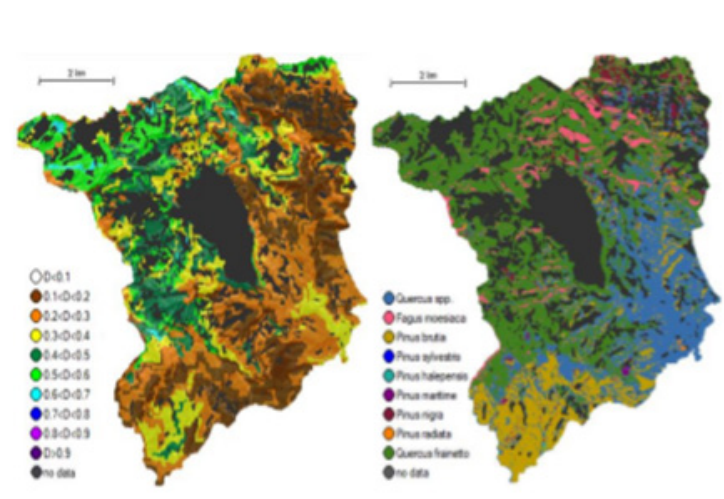

Figure 1: An example of monitoring ecosystem biodiversity and disturbance remotely, using Simpson's diversity index (left) and object-based image analysis classification for forest tree species (right) on Sentinel-2 imagery. The study area is Taxiarchis University Research Forest in Chalkidiki, Greece [4].

At the same time, during this peculiar time of quarantines and movement restrictions, the cocalled "anthropause", we are presented with an opportunity to observe the natural world in the absence of humans, using non-invasive means, such as remote sensing and lidar technology [5]. In addition, bio-loggers, which are miniature, animal-attached electronic devices, which measure changes in animals' movement, behaviour, activity and physiology, as well as in their environments, are expected to give us valuable insights into what happens in the absence of human intervention [6-10]. We are likely to realize that more emphasis needs to be placed on refraining from interfering with natural processes, instead of introducing innovative engineering on systems already engineered to do an amazing job in keeping our species' viral load under control through natural competition and synergy [11-13].

How to cite this article: Maria K. Re-evaluating nature's innovative engineering during the covid19 pandemic Maria Kampouri. JOJ Wildl Biodivers. 2020: 3(2): 555610

References

1. Monto AS, Fukuda K (2020) Lessons from influenza pandemics of the last 100 years. Clin Infect. Dis. 70(5): 951–957.
2. Shreedhar G, Mourato S (2020) Linking Human Destruction of Nature to COVID-19 Increases Support for Wildlife Conservation Policies. Environ. Resour Econ
3. Forti LR, Japyassú HF, Bosch J, Szabo JK (2020) Ecological inheritance for a post COVID19 world. Biodivers. Conserv. 13:1-4.
4. Raven H, Wilson E O (1992) A Fifty-Year Plan for Biodiversity Surveys. Science 258(5085): 1099-1100.
5. Rutz C, Matthias-Claudio Loretto, Amanda E Bates, Sarah C Davidson, Carlos M Duarte, Walter Jetz (2020) COVID-19 lockdown allows researchers to quantify the effects of human activity on wildlife. Nat Ecol Evol 4(9):1156-1159.
6. Bates AE, RB Primack, P Moraga, Carlos M Duarte (2020) COVID-19 pandemic and associated lockdown as a "Global Human Confinement Experiment" to investigate biodiversity conservation, Biol Conserv.
7. Diffenbaugh NS, CB Field, EA Appel (2020) The COVID-19 lockdowns: a window into the Earth System, Nature Reviews Earth & Environment.
8. Kampouri M, Kolokoussis P, Argialas D, Karathanassi V (2018) Mapping of forest tree distribution and estimation of forest biodiversity using Sentinel-2 imagery in the University Research Forest Taxiarchis in Chalkidiki, Greece. Geocarto Int. 34: 1273-1285.
9. Kolata G, How pandemics end? Published in the New York Times.
10. Manenti R, Emiliano Mori, Viola Di Canioa, Silvia Mercurio, Marco Picone, Mario (2020) The good, the bad and the ugly of COVID-19 lockdown effects on wildlife conservation: Insights from the first European locked down country. Biol Conserv 249: 108728.
11. Petersen E, M Koopmans, U Go, DH Hamer, N Petrosillo (2020) Comparing SARS-CoV-2 with SARS-CoV and influenza pandemics. Lancet Infect Dis. 20(9): E238-E244.
12. Pierre J (2020) Nudges against pandemics: Sweden's COVID-19 containment strategy in perspective, Policy and Society 393: 478-493.
13. Roe D, Dickman A, Kock R, Milner-Gulland E J, Rihoy E, (2020) Beyond banning wildlife trade: COVID-19, conservation and development. World Dev. 136:105121.

How to cite this article: Maria K. Re-evaluating nature's innovative engineering during the covid19 pandemic Maria Kampouri. JOJ Wildl Biodivers. 2020: 3(2): 555610