

NOTES

Exploring the nexus between pandemics and natural capital: COVID-19 and other zoonoses

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The COVID-19 pandemic has had a wide impact on our lives (Hakovirta and Denuwara, 2020) and is going to have further direct and indirect impacts on our ‘common home’. Besides justified renewed attention to human health and to reinforce the sanitary systems, reasonable worries are developing around the impact of the pandemic on food systems¹ and on possible solutions to be enacted for counteracting the effect of present and future emergencies and ensuring access to food to human population worldwide. After 2007-08 and 2010-11 economic crises, our globalized economic system has been once again set on the edge of a deep crisis. In this context, a debate is arising on the main factors at the base of the spread of pandemics and misleading concepts/interpretations are more and more at the centre of media attention. Such misleading information could drive current mainstream opinion in a direction that can further impair the natural capital, increasing risk for new pandemic outbreaks and further ingenerating unbalance in food access.

Natural Capital and COVID-19

In the frame of the COVID-19 pandemic scenario, a wide and hot debate is going on, trying to explain and to find out where the pandemic came from and what are the causes of its occurrence. The discussion develops around two main points: a) whether the pandemic spread and spillover started because of habitat destruction (WWF, 2020; Lugassy *et al.*, 2019) or b) because of a too intensive and unregulated proximity between wildlife and humans in urban centres (Mariutti, 2020).

As matter of fact, zoonoses and spillover (Thompson, 2013) are not new phenomena and are more likely to occur when the contacts between humans and wildlife/animals are more frequent. Most of the epidemics affecting humans (e.g. Ebola, AIDS, SARS, avian influenza, swine flu) come from animals and so far we know from researchers that the current pandemic most probably originated from bats sold live and slaughtered in Chinese markets (Benvenuto *et al.*, 2020).

¹ IPES-Food, 2020. *COVID-19 and the crisis in food systems: Symptoms, causes, and potential solutions*. Communiqué by IPES-Food, April 2020. Available at: http://www.ipes-food.org/_img/upload/files/COVID-19_CommuniqueEN.pdf.

The hypothesis are: a) the zoonosis comes as a direct consequence of the high density of wild animal species with no sanitary control in highly anthropised contexts (e.g. cities, urban centres, markets), where traditional dietary models persist in urban contexts characterized by high human density; b) the zoonosis comes from more frequent contacts between wild animals and human population resulting as a direct consequence of the loss of natural habitats and of the disruption of living environments or niches where wild animals live.

In the first case sustainable hunting and supply chain tracking and strict sanitary control can be the best way to decrease the risk; while in the second case urgent actions should be devoted to conserve natural capital and entail the restoration of the ecological niches and habitats. Both the hypothesis appear correct and possible, then the real question is: “Which of these actions requires priority and immediate attention because is at the real core of the recovery?”

There are some elements that require further attention: Food crisis and difficult or no access to food increases the consumption of bushmeat in many countries, and also to an increase of often illegal cross border trade due to low prices of such meat and the mixing of species typical of markets increases the probability of emergence of new viruses able to infect new species, including humans, starting from urban markets where authorities in charge for control are not able to monitor the health safety status of people and wild animals. On the other hand, the continued loss of habitats and their disruption, lead different species of wild animals to live closer to each other, in non-healthy conditions and increases the possibility for spillover (Kilpatrick and Randolph, 2012; Lambin *et al.*, 2010; Morse *et al.*, 2012).

For more, when it comes to pandemics another element to be considered is the speed of spreading of the disease, i.e. the factor at the base of the transition from epidemic to pandemic. People density, goods and people movement around the globe facilitated the quick spreading of the disease avoiding or contrasting the possibility of the virus of adapting to its new host – the human. The speed of diffusion is important because in nature a balance exists between the virus and the host species aimed to maximize its survival and its ability to multiply; as matter of fact the death of the host for a virus means the death of the virus itself, then an adaptation mechanism between viruses and hosts allow both to survive; but the emergence of such adaptation mechanism after the spillover requires some time. The high level of contacts between people coming from all over the world was a weak point that greatly facilitated the spread of the disease before the adaptation could occur; emergency measures essentially aimed to decrease the intensity of contacts between people slowing down the spreading.

The fallouts of distance measures included a prompt response from natural capital. After the lockdown, the quality of air and the quality of marine water, in some measure, improved; some neighbouring animal species ranged out invading ‘our’ urban centres. Nature is trying to regain space, but beside the wonder, in front of such manifestations, there is a growing feeling of fear because the zoonosis originated from contacts between wild animals and humans, and people are starting to overestimate the risk of a closer contact with animals and nature; people are perceiving the presence of wild animals as a concrete risk, directly connecting the idea of pandemic risk with nature.

Beside, this pandemic will negatively affect our natural capital also in other ways; the increase of attention and efforts devoted to face challenges (present and future) that may

derive from pandemics, can dilute the efforts in protecting and conserving natural capital. For instance, a renewed attention will be paid to reinforcing health systems worldwide but no or little consideration is devoted to the impact that this might have on environment as widely justified by the emergency and responsible of a high level of CO₂ equivalents (Eckelman *et al.*, 2018). The lockdown led to a decrease of GHG emissions worldwide but all activities are re-starting to the business-as-usual level.

The recovery beyond the emergency

In facing the emergency, the lockdown and social distancing measures are necessary in order to slow down the transmission of a virus until a new balance is achieved and human fatality rate decreases.

To face zoonoses, the health sector needs to be reinforced either to face the emergencies or to enact correct surveillance; monitoring systems need to be enhanced to avoid impact of present or future diseases and to avoid enforcement of new lockdown measures and their devastating economic impact.

Short term solutions to decrease the risk of pandemics should actually include both possibilities: safety control of market, contrast to illegal trade of wild bushmeat and also agriculture that is fundamental to feed the growing global population as well as to support development all over the world. Plants are the foundation of life on earth, they are the first trophic level, are a primary source of matter and provide food for our planet, this poses agriculture at the “human-animal-ecosystem interface” and, as such, it is increasingly impacted by the evolution and emergence of pathogens, not only those affecting humans, representing global risks.

The world, even before the COVID-19 pandemic, has been facing a number of challenges that threaten food security and the society’s wellbeing; climate change [increase of 2°C global average temperature by 2060 – (IPCC²)], biodiversity loss (loss of 10-15% by 2050) and depletion of natural resources [exceeded double by 2050 in respect to ‘planetary boundaries’ – International Resource Panel³], put pressure on the food availability and increase the risk of outbreaks of new pests and pathogens as a consequence of both global changes and the way food is produced, handled and consumed. Human population displacements – due to economic, political and humanitarian crises – represent another set of potential drivers for emerging issues (Richardson *et al.*, 2016).

Solutions are needed that could match in the meantime the facing of the emergency and the caring for natural capital. Emergency measures to contrast epidemics are necessary but should be applied in a transitory way, while long-term solutions aiming to reinforce the health system, to change the food system model and to protect natural capital and ecosystems are to be acted urgently.

² IPCC, 2018. Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Geneva, Switzerland: World Meteorological Organization.

³ International Resource Panel, 2019. *Global Resources Outlook 2019: Natural Resources for the Future We Want*. A Report of the International Resource Panel, United Nations Environment Programme (UNEP), Nairobi (Kenya). <https://www.resourcepanel.org/file/1172/download?token=muaePxOQ>.

In this context, the One Health approach⁴ started some years ago by the World Health Organization (WHO) and encompassing, *inter alia*, food safety, control of zoonoses, combatting antibiotic resistance, could help enacting preventive measures on the base of a robust long-term outlook; to be really effective it should be strengthened and reinforced by including the whole agriculture sector and informing the whole food sector.

Agricultural systems of the future will cultivate with limited natural resources, face new pests and diseases derived from climate change effects and unbalanced environment, while, at the same time, struggling to reduce GHG emissions and increase crops productivity with no access to additional agricultural land.

There is a need to focus on the relationship between agriculture, food system and nature to ensure adequate access to food, a challenge that was clearly evident during the pandemic emergency. This calls for a new approach able to match productivity with the possibility to produce in more sustainable way by relying on the support provided by ecosystems through pest and disease regulation, and by other ecosystem services⁵ – such as carbon sequestration, climate regulation, flood and erosion control, water purification – that enable production to be achieved with reduced inputs and environmental impact.

Ecosystem services are goods or services provided by ecosystems that could be either directly or indirectly enjoyed, consumed, or used by humans. Natural capital, ecosystems are in charge of delivering all the ecosystem services and, among others, the ability to regulate pest and diseases. Pest and diseases occur quite often even when balance and proper functioning of natural systems are in place, but the very quick spreading of this epidemic and its transition to a pandemic indicate that the mechanism of pest and diseases regulation exerted by natural capital and ecosystems is not working anymore and this is one of the key messages we should learn from this pandemic. The solution is not in investigating or taking positions by choosing to blame the disruptive effect of human action or by fighting against nature, the solution can only be in an adaptive process to be enacted quickly and that operates on development models, which should ensure the provision of the whole set of ecosystem services but most of all could guarantee the self-supporting ability of ecosystems and natural capital to perpetuate themselves.

To achieve proper insight transdisciplinary research is required to use concepts and methods deriving from various disciplines as basic tools to look for answers and solutions. This will help to overcome limitations deriving from compartmentalization of disciplines and will contribute to respond to questions arising from pressure exerted by global drivers of change. The transdisciplinary paradigm will be adequate to articulate different disciplines by constructing a solid support to expanded ‘one health’ approach, including a state of complex physical, chemical and biological processes between the nature-human-soil-plant-water and climate systems over time and space.

Key functions of the natural capital, self-support enabling ecosystems should be recovered and this is even more urgent in countries already facing though challenges coming

⁴ WHO, 2017. *One Health*. <https://www.who.int/news-room/q-a-detail/one-health>; WHO, 2020. Food safety. <https://www.who.int/health-topics/food-safety>.

⁵ CICES, 2020. *CICES - Towards a common classification of ecosystem services*. <https://cices.eu>; Haines-Young R., Potschin M.B., 2018. *Common International Classification of Ecosystem Services (CICES) V5.1 and Guidance on the Application of the Revised Structure*. Available at: <https://cices.eu/content/uploads/sites/8/2018/01/Guidance-V51-01012018.pdf>.

from climate change. In this context, food system and ecosystem need to be reconciled and a strong change of mind is needed to steer to transition and to do that in time so as to restore at least a bit the unbalance between nature asset/natural capital and anthropic activities.

The European Union's growth strategy named the European Green Deal⁶ goes in the direction of a green and inclusive transition to help improving people's well-being and securing a healthy planet for the generations to come. This could be the opportunity to really start a change in our model of development, hoping that 'graduality' would not hamper reaching the final aim. In line with the European Green Deal, on the 20th of May 2020, the European Union issued the Biodiversity Strategy for 2030,⁷ which focuses on natural capital, and, the same day, the EU Farm to Fork Strategy,⁸ which focuses on the food system. All the three documents (viz. European Green Deal, Biodiversity Strategy for 2030, Farm to Fork Strategy) present a strong perspective of change in relation to Natural capital, Food System and, finally, the Development Model. They also conceptually integrate well with the One Health approach, which is a premise for cross-fertilization and transdisciplinary approach (Eggermont *et al.*, 2015) as well as nature-based solutions.⁹

Conclusions

Among the many questions arose in the pandemic era, the most pressing is about "how to prevent future zoonoses and to make our systems more resilient to pandemics without jeopardizing natural capital and ecosystems."

We need to raise awareness of the basic mechanisms that co-acted in determining the quick spreading of COVID-19 in order to adopt measures of containment, but also to enact long-term biodiversity-based solutions, because zoonoses as well as other diseases have higher probability to occur, develop and spread when our development model and natural capital conflict.

The clear, manifested intention to pursue the general aim of saving our 'common home' and our common future, is widely shared, at least apparently at EU level. At wider level though, things can go in a different way. Actually richer entities and countries may not be so available or feeling ambitious in reducing human impact and in protecting or restoring ecosystem and the provision of ecosystem services. Poorer countries are struggling on different fronts, that in the time of the COVID-19 pandemic resulted even more pressing, urging them to act in various directions that can be very different from the expectations

⁶ European Commission, 2019. *What is the European Green Deal?* Available at: https://ec.europa.eu/commission/presscorner/api/files/attachment/859152/What_is_the_European_Green_Deal_en.pdf.pdf (accessed 13/06/2020); European Commission, 2020. *A European Green Deal - Striving to be the first climate-neutral continent*. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en; European Commission, 2020a. *Europe's moment: Repair and prepare for the next generation*. Available at: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_20_940/IP_20_940_EN.pdf.

⁷ European Commission, 2020b. *EU Biodiversity Strategy for 2030*. https://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm.

⁸ European Commission, 2020c. *Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system*. https://ec.europa.eu/food/farm2fork_en. The Farm to Fork Strategy is at the heart of healthy and environmentally friendly. The Farm to Fork Strategy aims to accelerate our transition, neutral or positive environmental impact.

⁹ IUCN, 2020. *A Global Standard for Nature-based Solutions*. International Union for Conservation of Nature (IUCN). <https://www.iucn.org/theme/ecosystem-management/our-work/a-global-standard-nature-based-solutions>.

in terms of climate change mitigation/adaptation or ecosystem restoration. Without an integrated approach to mitigating the consequences of the disease emergence relating to environmental change, countries' abilities to achieve the Sustainable Development Goals (SDGs) and the Global Health Security Agenda (GHS) targets will be compromised. This can lead, in turn, to a setback of the actions devoted to reduce the anthropic impact on natural resources thus increasing pressure on ecosystem that would further hamper the achievement or restoration of a balance between what we get from our 'common home' and what we leave to allow its perpetuation.

Furthermore, even at EU level, signals of a growing feeling of uneasiness in respect to wildlife and to nature are showing. Everybody knows that nature is to be preserved, but discussion on land sharing and land sparing is starting to buzz and risks hampering the implementation of long-term actions and measures across Europe or can be exploited by parts of European societies that do not really pursue a reduction of environmental impact right after the economic impact of restriction measures. However, the commitment of governments will be strongly supported, with multiple mechanisms, by the European Green Deal. This will further put pressure on global economies and extra-EU countries that will require support to overcome further economic barriers and market distortions. In this respect, there is a need for a 'system thinking' approach to translate solutions into socio-economic and policy frameworks in order to build a new resilience that is more widely distributed in this world, which goes with different speeds toward the future.

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