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COMMENTARY

COVID19: The Pandemic of Neglected Biodiversity

Prof SK Sharma
Honorary Professor and Former Vice-Chancellor, HP Agricultural University, Palampur, Himachal Pradesh, India

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The year 2020 was supposed to be a Super Year for biodiversity, as two important programmes of the United Nations, The Decade on Biodiversity and the Strategic Plan for Biodiversity 2011-2020, were to be concluded by the year end. Besides, two key global inter-governmental meetings were planned during the year towards addressing the twin environmental crises of recent times: biodiversity loss and climate change. The Convention on Biological Diversity (CBD) COP 15 was to establish a post-2020 global biodiversity framework, while the UN climate change conference COP 26 was to address the challenges of climate change. These meetings have been postponed owing to COVID-19 pandemic. Nature, it seems, had other plans. The corona virus pandemic has put pretty much all of that at the back-burner. The International Day for Biological Diversity was observed on May 22 to raise the awareness and understanding of biological diversity and issues related to it. The theme of the current year is "Our Solutions are in Nature", which shows that nature, including biodiversity, is pivotal to answer a number of sustainable development challenges and the current pandemic that we all are fighting.

Some of the diseases that emerge in humans come from both domestic and wild animals, who are the carriers of such pathogens which are contagious in nature. Pandemics, however, are caused by activities that bring increasing numbers of people into direct contact with the deceased; hence, a single infected person can result in the disease spread. COVID-19 is believed to have originated in a wet market in Wuhan, China, where live animals are traded and carcasses of wild animals such as bats, rats, snakes, pangolins, baby crocodiles, etc. are marketed and displayed.

Biodiversity provides various ecosystem goods and services in different ways that are not always apparent or appreciated. Thriving ecosystems also provide a variety of benefits to surrounding humanity - from fresh water to food to fertile soil. Over the past 50 years, through increased population and climate change, humans consumed and degraded biodiversity and ecosystems more rapidly than during any other time in human history. The impact of biodiversity loss and ecosystem degradation has broad and systemic implications that are connected to many pressing challenges that humanity face today.

Researchers today believe that it is actually humanity's destruction of biodiversity and ecosystem services which led to the appearance of new viruses and diseases such as COVID-19 with profound health and economic impact in rich and poor countries alike. Some of the activities contributing to biodiversity and ecosystem services loss are logging, mining, road construction in remote places, building of dams and irrigation projects, development in coastal areas, rapid urbanization, population growth, etc. Forest fires alter habitats, yield less food and send foraging wildlife in contact with nearby humans and thereby creating greater opportunities for the vectors of zoonotic bacteria, viruses and parasites.

Another important factor is the climate change, which is, both a cause and an effect of biodiversity loss. Climate change has severe direct and indirect impact on biodiversity and is predicted to be a dominant driver of future biodiversity loss. Several other drivers of biodiversity loss include habitat degradation/destruction and the introduction of invasive alien species to ecosystems, which get magnified by the effects of climate change. The loss of species and habitats contributes to climate disruption, which in turn can accelerate biodiversity loss — both of which can contribute to the rise of pandemics. The consumption and import/export

*Author for Correspondence: Email- skspbg@yahoo.co.in

thereof of exotic animals have two major consequences: i) increasing the risk of an epidemic by putting human beings in contact with rare infectious agents and ii) putting enormous pressure on wild populations resulting in the loss of biodiversity.

The Regional Assessment Report on Biodiversity and Ecosystem Services released by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) at Medellin, Colombia during 2018 indicated that biodiversity is declining in all regions of Asia-Pacific including India. The IPBES Global Assessment Report (2019) has evaluated the progress in achieving key international goals ranging from the Sustainable Development Goals (SDGs) and Aichi Biodiversity Targets, to the Paris Climate Agreement. The report concludes that if biodiversity loss needs to be halted, deterioration of nature must be slowed down and the biodiversity, climate and sustainable development goals must be achieved by 2030. "Business as usual" will not work; instead societies and economies will be driven to greater risks.

Until some effective vaccine is made available to control the COVID-19, increasing immunity is being advocated to avoid the infection. Ayurveda, the Indian Traditional System of Medicines, lays emphasis on promotion of health concept by strengthening host-defence system thereby attaining resistance against different diseases. Herbal drugs are known to possess excellent immuno-modulatory properties. Besides, these plants have other properties like delaying the onset of senescence and improving the mental functions. This concept has been described as *Rasyana* in Ayurveda and known to employ around 700 plant species. Besides, there are large number spices, fruits, nuts, and vegetables, which are consumed to improve immunity since time immemorial. These are very valuable components of the biodiversity and need to be protected and used.

The biodiversity protection and climate change mitigation go hand-in-hand and are mutually dependent. Managing and protecting biodiversity will mitigate the negative impact of climate change and help humans adapt to it. Policies and actions aiming at limiting the effects of climate change will contribute to the protection of biodiversity. The focus on biodiversity conservation should be on a growing movement towards nature-based solutions, which harness the power of ecosystem services to mitigate the effects of climate crisis, non-sustainable food systems, water pollution and other environmental challenges. To protect nature and avoid lethal pandemics, environmental regulations must be strengthened and enforced, and stimulus packages that offer incentives for more sustainable activities must only be deployed.

There are high hopes that the post-2020 global biodiversity framework will take an ambitious but practical approach in addressing these concerns, improving on the Aichi Biodiversity Targets to increase the area of protected land and water worldwide. Besides, it will have to address the drivers of biodiversity loss, emphasize that biodiversity loss and climate change are related problems, and give the policy measures some teeth. Protecting nature is our foremost duty to safeguard human health and strengthen the nations. Successful drug development is not always about advanced synthetic biology; there is also a link to nature-based solutions and biodiversity as researchers are increasingly reverting to nature to look for new therapeutic options.

The COVID-19 pandemic is a wakeup call for a healthier planet. Protecting nature and ensuring the sustainable use of natural resources could help prevent the next pandemic. Future pandemics are likely to happen more frequently, spread more rapidly, have greater economic impact and kill more people if we are not extremely careful about the possible impact of the choices we make today. The right mix of policies for protecting nature, sustainable use of natural resources and educating local communities about the dangers of zoonotic diseases, could play a significant role in sustainable development with important co-benefits for people, biodiversity and the climate. Community of plant genetic resources researchers have responsible role to play.