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Ecological solutions to prevent future pandemics like COVID-19

Globally, forest covers 3,999 million hectares (ha), which is 30.6% of the Earth's land surface. The world is losing its forest at an alarming rate of 3.3 million ha per year. Over a quarter (27%) of the global forest loss is due to deforestation through permanent land use change for commodity production. Only 40% of the world's forests are in good condition. In Nepal, forest covers about six million ha (40% of the total land area). Between 2000 and 2010, Nepal lost 22,314 ha and gained 13,598 ha of forest, resulting in a net decrease in forest area by 8,716 ha.

According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Service (IPBES) Global Assessment Report 2019, about 75% of the Earth's terrestrial environment has been severely altered by human actions. Deforestation and biodiversity loss are often considered as the key drivers of zoonotic disease emergence. Zoonoses are diseases transmitted from animals to humans. They comprise 60% of all infectious diseases in humans and 75% of all emerging infectious diseases. EcoHealth Alliance, a non-governmental organization, states that nearly one in three outbreaks of new and emerging diseases are linked to land-use change like deforestation. Deforestation and anthropization are among the most important factors that assist disease outbreaks. Deforestation exposes livestock and humans to zoonotic disease. Disease spillover is connected to the likelihood of human-animal interactions. These interactions increase the likelihood that animal viruses are jumping to humans.

The Coronavirus Disease 2019 (COVID-19) outbreak caused by Severe Acute Respiratory Syndrome (SARS) Coronavirus 2 (CoV-2), which was first detected in December 2019 in Wuhan, China, has caused 35,88,773 infections in 214 countries and 2,47,503 deaths by 6 May, 2020. The World Health Organization (WHO) has already declared the COVID-19 outbreak as a pandemic.

Wild animals (bats) are thought to be the most likely reservoir for SARS-CoV-2 as it is very similar to a bat coronavirus responsible for the SARS outbreak. SARS-CoV which caused the SARS Pandemic in 2003 and MERS-CoV, causing Middle East Respiratory Syndrome (MERS) in 2012, were found to have been transmitted from bats to animals – palm civet and camel, respectively, which subsequently infected humans. It is suspected that pangolins may have served as the intermediate host, which transmitted the SARS-CoV-2 virus to humans. Bats are usually beneficial to humans. They play an important role in agriculture by assisting in pollination and controlling insect populations. However, bats are also hosts of many viruses; 31% of the bat-borne viruses are corona viruses. Anthropized environment attracts different bat species, which in turn creates high concentration of bat-borne viruses. The risk of new viruses likely to emerge from bats is very high due to three main reasons: (i) bats account for about one-fifth of the total mammal species (1,200) in the world, (ii) they live in large colonies making easier to pass viruses among one another, and (iii) they are more resistant to viruses.

Recently, it has been reported that tigers and lions in the Bronx Zoo (USA) tested positive of COVID-19, which is assumed to have been transmitted from a zoo-worker. A new study has found out that cats are highly susceptible to COVID-19. There are possibilities of the spread of the virus amongst wild animals and also the transmission of the virus from humans to wild animals and vice-versa. The likelihood of emergence of zoonotic diseases is high given the increasing interactions between humans and wild animals. The COVID-19 Pandemic has been driven by human-to-human transmission till now, but this human to animal transmission has raised new queries regarding the measures to monitor wildlife health and take actions to reduce the risks.

Our planet "Earth" is under severe threat because of excessive human activities. Human activities have put many species at risk. The 2019 UN report reveals that humans threaten one-eighth of the Earth's species (one million species). About 18% of the wild animals are affected from wildlife trade. We need preventive, long-term, and ecological solutions to prevent future pandemics. COVID-19 stimulus package must save lives, protect livelihoods, and safeguard nature to reduce the risk of future pandemics. In order to protect our planet "Earth", one health policy is important. The Government of Nepal has recently approved the "One health strategy, 2019" which recognizes that human health is connected to animal health and environment. In this regard, multidisciplinary research approach on surveillance and monitoring of wildlife, domestic animals, pets and human, their interactions, risk assessment and early detection and prevention is required.

Forests are important both for the people and our planet "Earth". Forests provide both wood and non-wood products together with various ecological services including disease containment. Forests are home to about 80% of the world's terrestrial biodiversity. The world's forests can absorb up to 40% of the anthropogenic CO₂ emissions. An estimated 1.6 billion people depend on forests for their livelihoods. The 2018 UN Report on Climate Change has highlighted the importance of reducing deforestation to keep global warming below 1.5°C.

Humans and nature are parts of one connected system, so protecting plants and animals is protecting human. Therefore, forests, the lungs of the Earth, and biodiversity conservation should be the focus of the long-term ecological solutions that may include- stopping deforestation, ban on live animal markets and wildlife trade, adoption and implementation of the one health policy, monitoring and surveillance, and accelerating research and developmental works. The world has failed to learn from the previous zoonoses such as SARS, MERS, Avian flu, Ebola, and Malaria. Humans continue to destruct nature, consume wild meat, and involve in wildlife trade, putting the entire world at great risk. Deforestation and biodiversity loss owing to human activities are linked to the outbreak of several global infectious disease outbreaks. Hope, all the nations of the world will learn this time from the outbreak of COVID-19 Pandemic, and do something together for maintaining our planet "Earth", the common home for human-beings and wild-lives, healthy for living.

Let us move on to ecological solutions to prevent future pandemics like COVID-19!

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