COVID 19: URGENT CALL TO PROTECT PEOPLE AND NATURE

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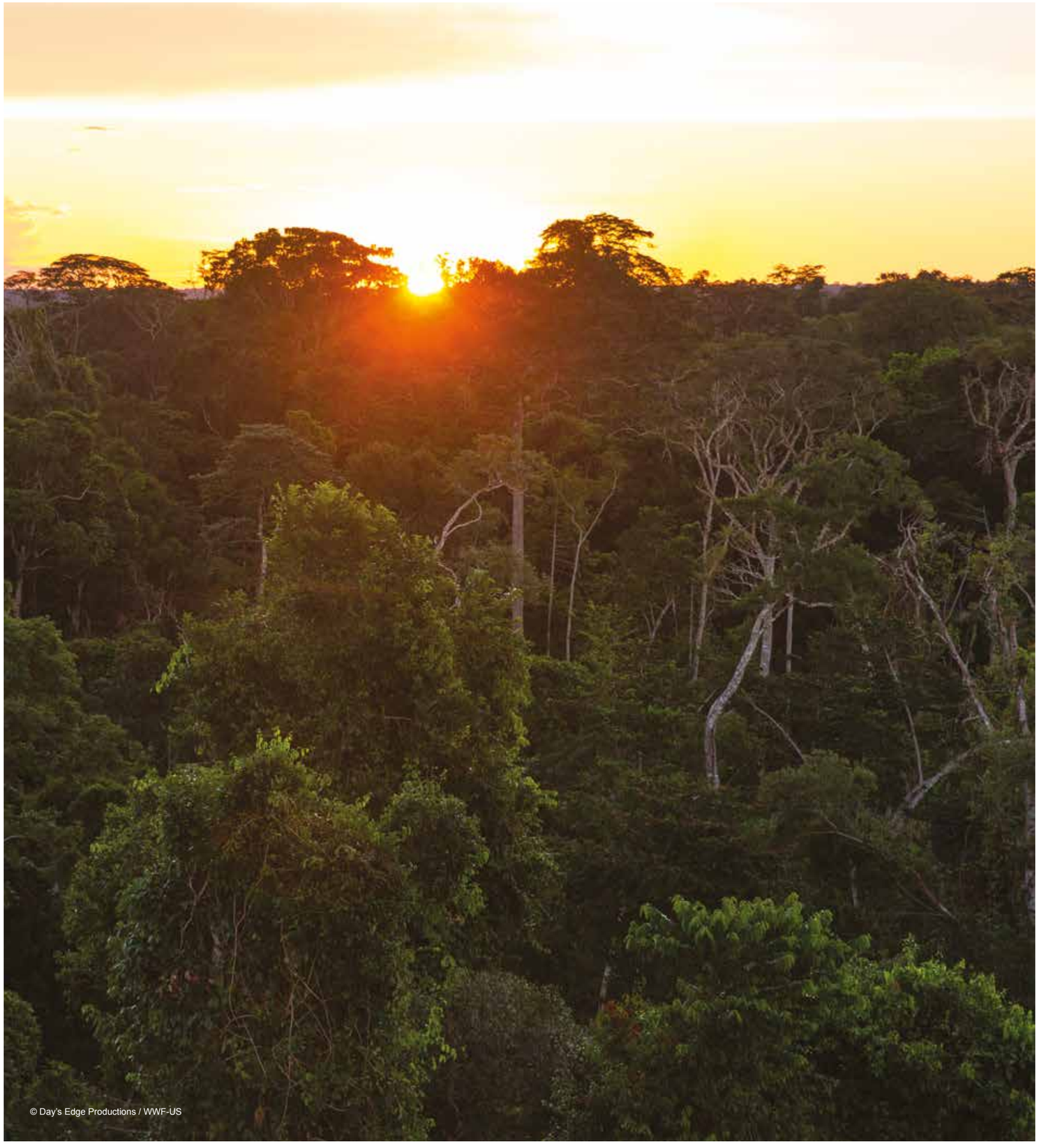

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WWF'S CALL FOR GLOBAL ACTION TO REDUCE THE RISK OF FUTURE PANDEMICS AND HEAL OUR BROKEN RELATIONSHIP WITH NATURE

CALL FOR GLOBAL ACTION

Humanity's broken relationship with nature comes at a cost. That cost is revealing itself in terrible ways during the current COVID-19 pandemic: from the mounting loss of life and untold suffering of families to the global economic shock that's destroying jobs and livelihoods**.** The longer the crisis continues, the greater the threat will be to global peace, security and stability. Yet, there is a real opportunity in the midst of this tragedy to heal our relationship with nature and mitigate the risk of future pandemics.

New zoonotic diseases are emerging at an alarming rate. The COVID-19 health crisis reconfirms how people and nature are interlinked, and how our negative impact on the natural world increases the risk of future pandemics. As high-risk wildlife continues to be exploited and the natural world encroached upon, the risk is growing. In our increasingly globalized world, the probability is higher than ever that a new disease becomes a global pandemic, with serious consequences for our health, economies and ecosystems.

This is a pivotal moment to build a safer future for people and the planet. *COVID-19: Urgent Call to Protect People and Nature* shows that the key drivers for the emergence of zoonotic diseases are land-use change, expansion and the intensification of agriculture and animal production, and the consumption of high-risk wildlife. WWF urges governments, companies and individuals to tackle these key drivers and so create a healthier world for people and our planet.

Although we cannot always foresee and prevent these diseases, we can act to heal our relationship with nature and reduce the risk of future pandemics.

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WWF CALLS ON ALL GOVERNMENTS TO:

- Halt the high-risk wildlife trade and increase enforcement to combat illicit wildlife trade.
- Introduce and enforce legislation and policy actions to eliminate deforestation and conversion from supply chains.
- Commit to and provide adequate finance for the implementation of an ambitious post-2020 Global Biodiversity Framework.
- Commit to a New Deal for Nature and People, that puts nature on the path of recovery for the benefit of all people and the planet, with three goals:
  - Protect and restore natural habitats
  - Safeguard the diversity of life
  - Halve the footprint of production and consumption.
- Incorporate a One Health approach – linking the health of humans, animals and our shared environment – within decision-making on wildlife and land-use change.
- Design COVID-19 economic recovery packages that ensure a green and just transition and facilitate increased investment in sustainable and resilient business models.
- Support vulnerable communities to protect their food security and livelihoods in sustainable and resilient ways, including the recognition of indigenous peoples' land and water rights.

WWF CALLS ON ALL COMPANIES AND INDUSTRIES TO:

- Implement and strengthen all voluntary environmental measures during and after the crisis.
- Deliver credible action to decrease the environmental footprint of food supply chains, including promoting sustainable production, ensuring supplier traceability to points of origin, and encouraging consumers to make sustainable dietary choices.
- Support policies and legislation that ensure all production and consumption of agricultural commodities are free from deforestation and conversion of natural ecosystems.
- Incorporate a One Health approach within all business and financing decisions, particularly risks related to threats to global health.
- Develop and implement innovative financial mechanisms and solutions that have positive environmental and social outcomes.

WWF CALLS ON CIVIL SOCIETY ORGANIZATIONS TO:

- Support vulnerable communities directly affected by the crisis and its environmental drivers, ensuring that they are adequately represented in recovery efforts.
- Work together with governments and industries to develop sustainable solutions that reduce illegal and high-risk wildlife exploitation and transform our food systems.
- Increase accountability of international institutions, governments and industries that fail to take action in the wake of the crisis.

WWF CALLS ON THE PUBLIC TO:

- Engage with our government representatives to ensure that they commit to a New Deal for Nature and People, take action to protect natural ecosystems, and strengthen their nature and climate commitments.
- Call on industries to demonstrate leadership through decreasing their negative impacts on society and the environment.
- Shift their dietary and consumption habits to make more sustainable choices.

EXECUTIVE SUMMARY

New zoonotic diseases are emerging at an alarming rate, driven by humanity's broken relationship with nature.

In recent decades, people have increasingly encroached upon the natural world, resulting in escalating levels of contact between humans, livestock and wildlife. As a result, the frequency and number of new zoonotic diseases, originating in animals and transmitted to people, has risen drastically over the last century. Every year, around three to four new zoonotic diseases are emerging. These new diseases pose a grave threat to human health, causing deadly pandemics including HIV/AIDS, Severe Acute Respiratory Syndrome (SARS), and most recently COVID-19.

The increased emergence of zoonotic diseases is linked to two widespread environmental risks:

- **Driven by unsustainable food systems, the large-scale conversion of land for agriculture is increasing interactions between wildlife, livestock and humans.** Land conversion is destroying and fragmenting forests and other natural habitats around the world, resulting in higher levels of contact between wildlife, livestock and humans. This problem is only set to worsen as the challenge of feeding a growing population increases and diets shift.
- **Poor food safety standards, including permitting the trade and consumption of high-risk wildlife species, are increasing human exposure to animal pathogens.** Globally, demand for wild meat is growing, as either a delicacy or a necessity, driving increased sale and consumption, and increasing the potential for exposure to diseases during high-risk sourcing, handling and preparation practices.

The risk of a new zoonotic disease emerging in the future is higher than ever, with the potential to wreak havoc on health, economies and global security. The COVID-19 crisis exemplifies the devastating costs of global pandemics. Between December 2019 and May 2020, over 370,000 people died from COVID-19 related causes in more than 200 countries, which is just under three times the number of people killed by armed conflict and terrorism every year. The economic impact has been estimated at between US$2.4 and US$8.8 trillion in lost output, which is almost three times the GDP of the UK. Almost half of the world's workforce is at risk of losing their livelihoods, with the social and economic effects disproportionately affecting already marginalized groups, including women and indigenous communities. The drastic shifts driven by COVID-19 are also threatening global food security, with warnings that the number of people at risk of acute hunger could rise from 135 million to 265 million by the end of 2020. Further, COVID-19 may impact global stability, with tensions escalating in volatile areas, and geopolitical rivalries between countries predicted to worsen. Beyond these devastating costs, the same forces driving an increased risk of pandemics are also exacerbating the current planetary emergency of nature loss and climate change, putting the health of current and future generations at risk.

The COVID-19 crisis demonstrates that systemic changes must be made to address the environmental drivers of pandemics. To date, attempts to increase the sustainability of our food systems by addressing deforestation and land conversion, as well as to tackle the sale and consumption of high-risk wildlife have made some progress. However, many businesses have failed to meet their commitments and some governments have either not put in place, or failed to enforce, legislation. The pandemic has shown that whether tackling environmental issues or health crises, solutions must recognize the deep interconnectedness of different systems. The crisis has demonstrated the power of global responses to drive forward systemic changes, with unprecedented shifts in the way that people behave – from respecting social distancing to, in certain countries, hundreds of thousands of people volunteering to support the crisis response. Consequently, an unparalleled opportunity now exists to work together to address the unsustainable pressures that are being placed on the environment.

Now is the time for transformative action to protect natural ecosystems in order to reduce the risk of future pandemics and build towards nature positive, carbon neutral, sustainable and just societies.

A collective response to the crisis must protect nature by:

- Governments commit to a New Deal for Nature & People to deliver credible action that halts and starts to reverse the loss of biodiversity, putting nature on a path to recovery by 2030 for the benefit of all people and the planet
- Stopping illegal, unregulated and high-risk wildlife trade and consumption, and enforcing hygienic and safe practices across markets and restaurants
- Stopping land conversion, deforestation and fragmentation across natural ecosystems, while sustainably feeding a growing global population
- Building a new relationship between people and nature through a sustainable and just economic recovery.

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1. THE SYMPTOM: NEW ZOONOTIC DISEASES ARE EMERGING AT AN ALARMING RATE

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NEW ZOONOTIC DISEASES ARE EMERGING AT AN ALARMING RATE

1. THE SYMPTOM

The world is currently in the grip of the COVID-19 pandemic, an unprecedented global health crisis that emerged from animal pathogens.

Between December 2019 and May 2020, COVID-19 infected more than six million people worldwide, which is more than the population of New Zealand.[1] Tragically, the disease has killed more than 370,000 people in over 200 countries, which is just under three times the number of people killed by armed conflict and terrorism every year.[2] The emergence of COVID-19 has been linked to a disease prevalent in horseshoe bats.[3] Once it was transmitted to humans, the disease spread rapidly through our globalized society, reaching individuals in every region of the world.

COVID-19 is the latest of several recent zoonotic diseases emerging in people and demonstrates how human health and nature are closely interconnected. Interactions with nature can expose people to a wide range of animal diseases. In fact, approximately three to four new infectious diseases emerge each year, most of which originate from wildlife. Over the last 30 years, approximately 60-70 per cent of the new diseases that emerged in humans had a zoonotic origin.[4] Animal pathogens can infect humans directly through contact with the wild animals that are natural carriers of these diseases, or indirectly by transmission through intermediate hosts, such as livestock and domestic or peri-domestic animals that live in proximity to humans. These intermediate hosts act as "mixing vessels" that can lead to the genetic variation of diseases, enabling them to infect humans.[5]

Healthy ecosystems can help mitigate humanity's exposure and vulnerability to different health risks, including zoonotic diseases. Robust natural ecosystems enable access to necessities such as clean air, water, medicines and food, which strengthen health and immune systems as well as reduce vulnerability to all types of disease. For example, a study found that in the US, trees and forests removed 17.4 million tonnes of air pollution in 2010, which is equivalent to taking almost 4 million cars off US roads for a year.[6] The improved air quality alone led to an estimated reduction of more than 670,000 incidences of acute respiratory symptoms.[7] Further, when natural ecosystems like forests remain intact, interactions between major human population groups and wild host species are often more limited.[8] As a result, viruses circulate in natural ecosystems without crossing over into humans. Similarly, wild host species have fewer interactions with domesticated animals and livestock, which generally live in close proximity to humans.[9] It is therefore less likely for domestic animals and livestock to become intermediate hosts of these diseases. Some studies also suggest that greater biodiversity of species in a natural ecosystem like a forest may hinder disease transmission. This may be attributable to what scientists call the "dilution effect," which makes it more difficult for a single pathogen to spread rapidly or to dominate.[10] Evidence is not fully conclusive that this effect applies broadly across diseases, although one study found significant evidence of this effect in parasite systems and plant-herbivore systems.[11] One study reviewing over 200 assessments found significant evidence of the dilution effect weakening transmission in parasite systems and plant-herbivore systems.[12]

However, over the last century, there has been an alarming increase in the number and frequency of new zoonotic disease outbreaks. The frequency of zoonotic disease outbreaks caused by a spillover of pathogens from animal hosts to people may have more than tripled in the last decade.[13] The diversity of these pathogens has also increased, with the number of new zoonotic diseases infecting people quadrupling over the same time period.[14] These increases are driven by more frequent contact between humans and dangerous animal pathogens, as well as by contact with a wider variety of species, resulting in the emergence of new forms of diseases in humans. These new zoonotic diseases have posed a grave threat to human health around the world, causing global pandemics such as HIV/AIDS, Severe Acute Respiratory Syndrome (SARS), Swine Flu, Middle East Respiratory Syndrome (MERS), Ebola and currently COVID-19.[15]

The increase in zoonotic outbreaks is a symptom of a broken relationship between humans and nature, and is likely to worsen. As population pressures mount, people increasingly encroach into natural ecosystems, resulting in accelerating levels of contact between humans, wildlife and livestock. This results in additional exposure to new animal pathogens and creates dangerous conditions for spillover from one species to another. As the natural world continues to be degraded, the risk of deadly new zoonotic diseases emerging becomes higher than ever before.

Zoonotic diseases

Zoonotic diseases are any diseases originating from animals and transmitted to humans. They are caused by animal pathogens (e.g. bacteria, viruses, fungi or animal parasites). The event in which an animal pathogen infects a human and overcomes their immune system is called spillover.

Key definitions:

Pathogen: *an organism that causes disease (e.g. bacteria, viruses, fungi or animal parasites)*

Reservoir host: *an organism that carries a pathogen, often without causing disease for the organism itself*

Intermediate host or vector: *an organism that carries a pathogen as a result of cross-infection and that can be responsible for transmitting the pathogen to humans*

FIGURE 1: PATHOGEN FLOW AT THE WILDLIFE-LIVESTOCK-HUMAN INTERFACE

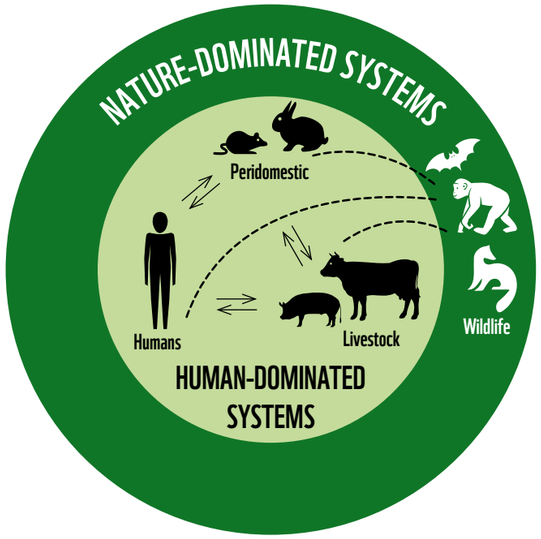
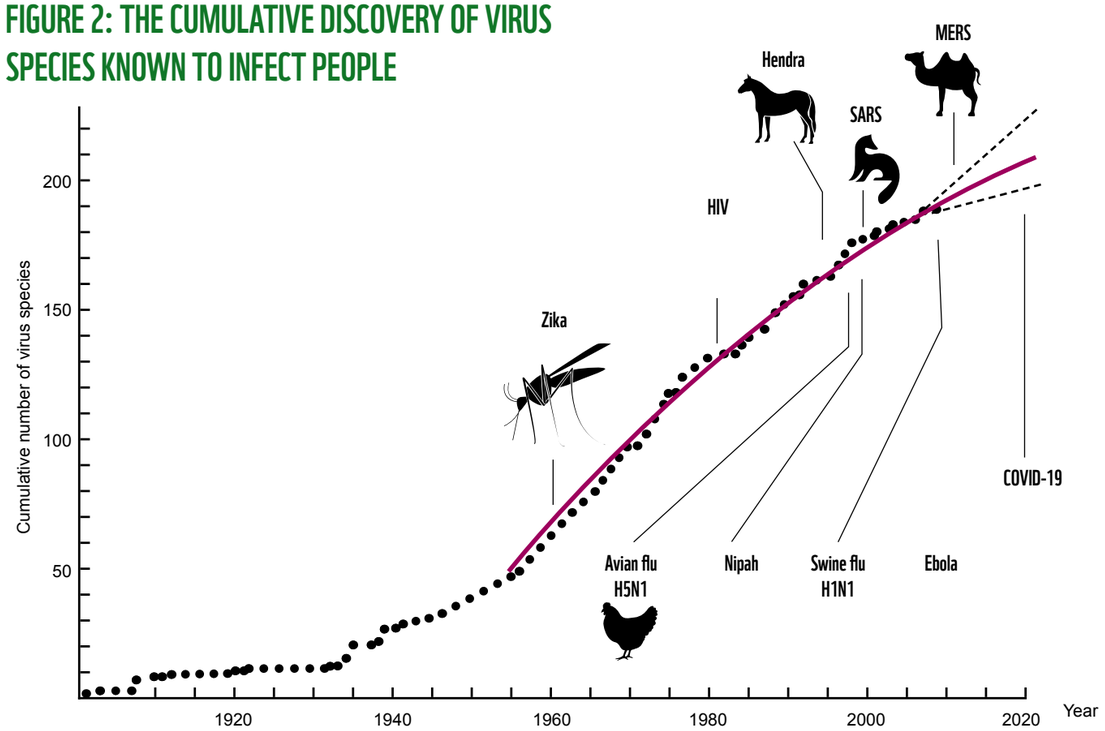


FIGURE 2: THE CUMULATIVE DISCOVERY OF VIRUS SPECIES KNOWN TO INFECT PEOPLE



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2. THE DIAGNOSIS: HOW HUMANITY'S BROKEN RELATIONSHIP WITH NATURE IS DRIVING ZOONOTIC DISEASE EMERGENCE

2. THE DIAGNOSIS

The risk of zoonotic diseases is accelerating, driven by two key factors: the trade of high-risk live wild animals and their meat, and unsustainable food systems driving the large-scale conversion of land for agriculture.

Firstly, the sale and consumption of high-risk wild species, both in and outside of wildlife markets, increases human contact with wild species, risking greater exposure to zoonotic diseases. Secondly, unsustainable food systems currently rely on the large-scale conversion of land for agriculture, which fragments natural ecosystems and increases interactions between humans, livestock and wildlife. These drivers are linked to the emergence of the most recent zoonotic diseases, including COVID-19, SARS and Ebola.

Risk 1: The illegal and high-risk trade and consumption of wildlife

Many recent pandemics, including COVID-19, have been linked to the high-risk trade and consumption of wildlife in markets and restaurants.[16,17] Increasingly global sales of wild animals, their meat and other products in markets which restaurants increase human contact with wild species and, in turn, increases exposure to zoonotic diseases. Questions remain about the exact origins of COVID-19, but all available evidence suggests that it is a zoonotic disease, meaning it jumped from wildlife to humans.[18] Even if this is not the case, wildlife markets (often stalls within larger, legal wet markets) create possibilities for spillover, especially when live wild animals are held in confined spaces or otherwise stressful conditions, in close proximity to meat, live domestic animals and humans. By keeping different species in cramped conditions together, the risk of genetic recombination between different viruses and transmission to new species, including humans, is escalated.[19,20] The improper handling of live domestic animals and their meat can also drive potential disease exposure, particularly when these animals are slaughtered on the premises or kept alongside other wildlife.

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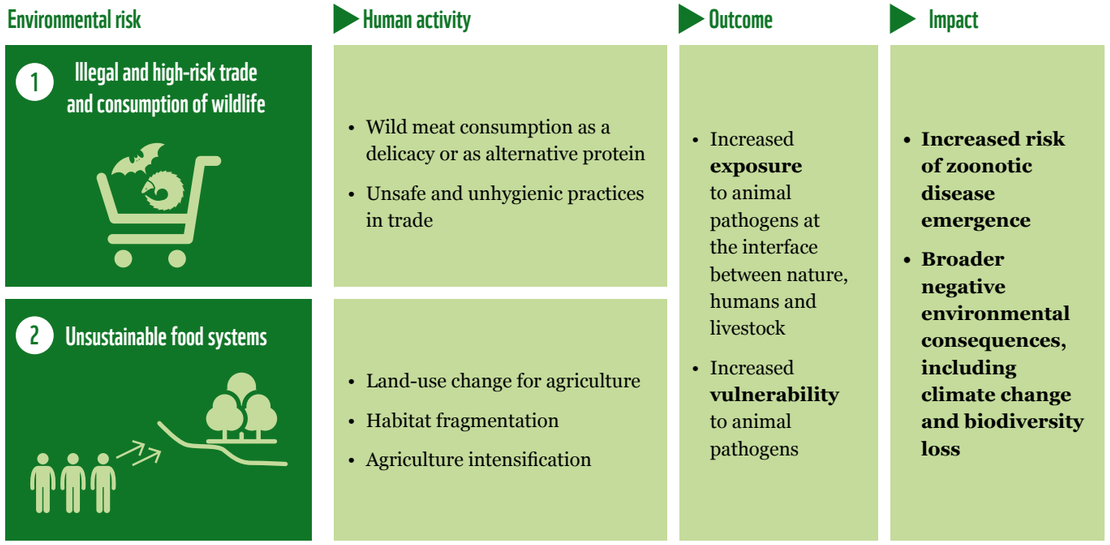
FIGURE 3: KEY DRIVERS OF NEW ZOONOTIC DISEASES



Wet markets are typically large collections of stalls selling fresh meat, fish, fruits and vegetables. In some instances, wet markets may sell live animals (wild and/or domestic) as well as slaughter animals on the premises.

Wildlife markets specifically sell wild animals for meat, as pets, or for other purposes (e.g., use in traditional medicine).

High-risk taxa are groups of species that pose a particular risk for the transfer of zoonotic diseases. They are: rodents, bats, shrews and shrew-like relatives, primates, carnivores and ungulates. Rodents carry 85 known zoonotic diseases, carnivores 83, primates 61, ungulates 52, bats 25, and shrews 21.[21]

The demand for wild meat as a culinary delicacy is growing around the globe, driving increased consumption in markets and restaurants. In some regions, urban dwellers want to consume wild meat as it is considered a delicacy and a status symbol, valuing its links to high socioeconomic status and food-related curiosity. In 2018, for example, the price of pangolin meat in some restaurants in Viet Nam was around US$300 per kilogram.[22] Similarly, a survey of wildlife consumption in three provinces in China found that high-grade restaurants and hotels accounted respectively for 41 per cent and 34 per cent of places where wild meat was consumed.[23] Domestic and foreign tourists are also driving demand, with local tourism suppliers often promoting the consumption of wild animals in travel destinations as a unique experience based on local traditions.[24]

The unsafe trade and transport of high-risk wildlife to new urban locations, for consumption or other purposes, also creates conditions for spillover.[25] Every year, hundreds of thousands of wild animals are traded across international borders for commercial purposes, often in cramped and unhygienic conditions. This leads to the movement of possible host species across these borders, enabling transmission between species and geographies *(see case study 1)*. For example, the live trade of dromedaries from the Horn of Africa to the Arabic Peninsula, particularly to markets in Saudi Arabia, has been linked to the emergence of MERS.[26] At a national level, wild animals are often transported from forests and other natural ecosystems into urban areas, with limited safe-handling, hygiene and transport regulations, leading to possible transmission across the supply chain.

Wild meat is also consumed as a source of protein in some regions, particularly in rural communities in developing countries, exposing individuals to dangerous pathogens.[27] The hunting, transportation, and cooking practices used in consuming wild meat for subsistence often do not follow any food safety standards.[28] Recent disease outbreaks, such as the 2014 Ebola outbreak[29] have been associated with the sourcing, hunting and butchering of wild animals such as bats and chimpanzees, suspected of hosting zoonotic diseases.[30] As the number of people experiencing acute hunger after the COVID-19 pandemic is predicted to rise significantly, there is a risk that the consumption of wild meat as a source of food security will grow. Given that protein consumption is essential to nutrition and health, there is an urgent need to ensure that the communities that depend on wild meat can obtain safe and sustainable sources of protein, and prepare them hygienically, or be assisted in developing alternative protein sources.

CASE STUDY 1: THE ROLE OF WILDLIFE MARKETS AND ILLEGAL TRADE IN THE 2002-2003 SARS PANDEMIC

Suspected host species:
Horseshoe bats (reservoir), Himalayan palm civets and raccoon dogs (intermediate) [31]

Number of deaths:
774 [32]

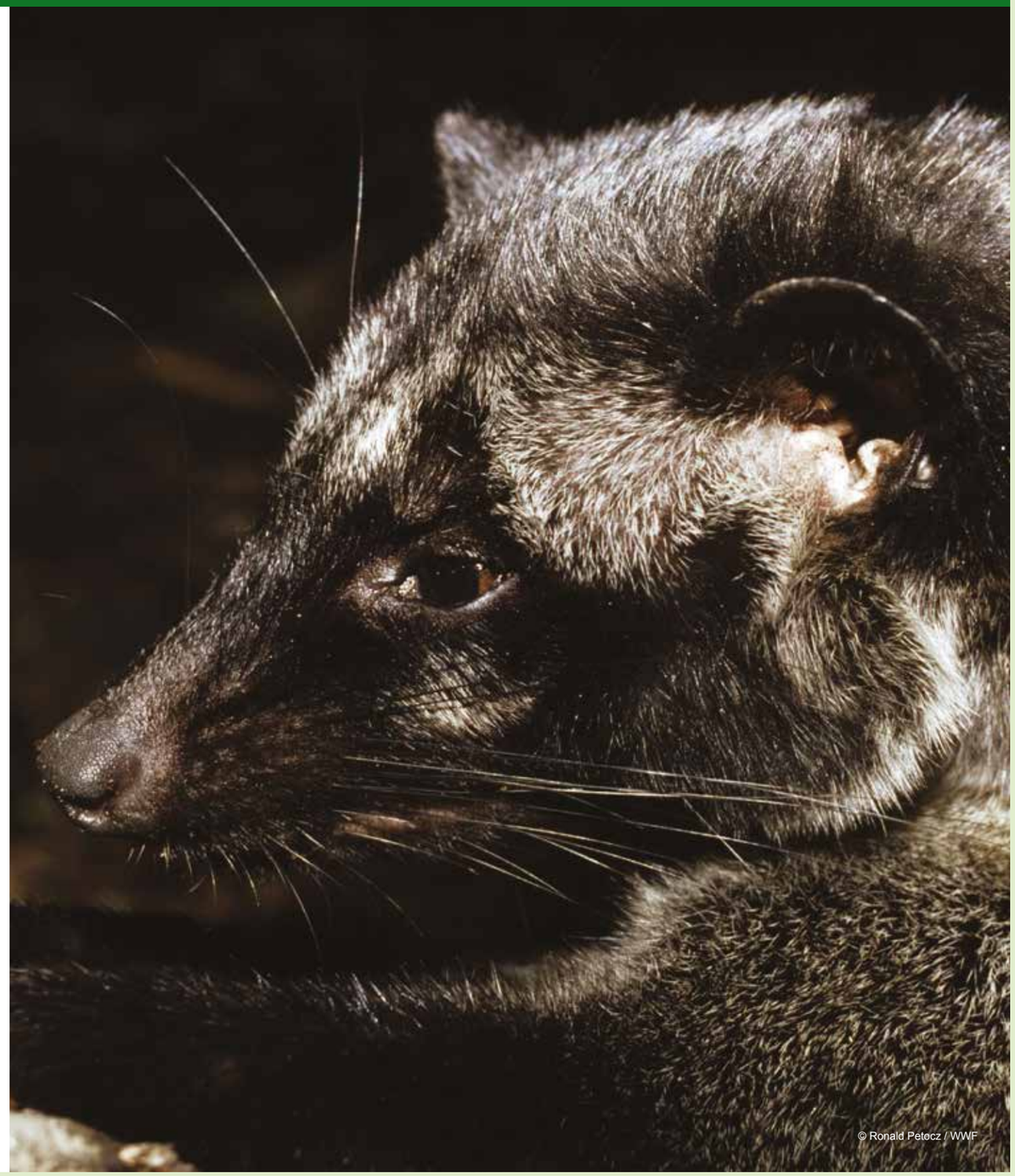
Estimated economic impact:
US$41.5 billion [33]

In 2002, the SARS-CoV virus spread from an animal host and infected humans in the Guangdong province of southern China.[34] The virus rapidly spread to 26 countries and resulted in more than 8,000 cases in 2003. SARS, the disease caused by this virus, was highly fatal. Over 700 people around the world died from the disease, almost 9 per cent of infected cases.

Although the evidence is not conclusive, the initial disease outbreak is likely attributed to human contact with infected palm civets and raccoon dogs in a wildlife market in Guangdong province. This was substantiated by the discovery of SARS-like viruses in these animals in Chinese wildlife markets after the initial outbreak.[35] Researchers also found that several of the early SARS patients in Guangdong were involved in selling or preparing wildlife for consumption, likely increasing their exposure to the virus.[36] Additionally, patient case data clearly implicates civets in directly transmitting SARS-CoV to humans. In particular, two cases in 2003 were directly linked to a restaurant in Guangzhou where six SARS-CoV-positive civets were housed in cages.[37] Although researchers cannot be certain that the initial transmission from animals to humans took place in a wildlife market, it is likely that wildlife markets and restaurants were central to the spread of SARS.

Studies have also linked the SARS outbreak with the illegal wildlife trade in small carnivorous mammals through unregulated handling practices. A significant proportion of the animals sold in wildlife markets enter China through a regional network of legal and illegal wildlife trade. Although it is difficult to pinpoint the true extent of the illegal wildlife trade in this region in the early 2000s, it is known that live species including turtles, civets and other small carnivores were exported to Chinese wildlife markets from Viet Nam and Lao PDR.[38] Some researchers therefore suggest that an infected host species was imported from a neighbouring country, potentially transmitting the virus to other wild animals during transportation. Although there is no definitive evidence, this explanation is plausible given that the regional wildlife trade system involved a high level of contact between species that would not usually have contact in their native habitats.[39]

Estimates of the total macroeconomic impact vary. However, the World Bank estimates that the global economic impact was US$41.5 billion, or around US$4 million per case.[40] The SARS pandemic led to an estimated GDP decrease of 1 per cent in China and 0.5 per cent in Southeast Asia, due to costs associated with healthcare spending, business closures, reductions in manufacturing, and the contraction of the tourism industry.[41]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Risk 2: Unsustainable food systems driving the large-scale conversion of land for agriculture

Land conversion for food and livestock production is destroying and fragmenting natural habitats around the world. The amount of land converted for food and livestock production is increasing at a rapid rate in order to feed a growing global population. Since 1990, 178 million hectares of forest have been cleared, which is equivalent to the size of Libya, the 18th largest country in the world. The loss of primary forest and grasslands has continued to grow in recent years, mainly driven by commodity production and shifting agriculture.[42,43] Most habitat loss associated with agriculture is attributed to just three commodities: beef, soy and palm oil.[44] As a result of extensive land conversion, about 70 per cent of forests globally are now within 1 kilometre of a forest edge and are exposed to further fragmentation.[45] Not only forests are at risk – over half of the original Cerrado and North American grassland prairies have also been lost.[46] Widespread land conversion has severe consequences for the natural world. Both forest and non-forest ecosystems, such as grasslands, have extremely rich biodiversity, play important roles in storing carbon and are often major water sources. Land conversion for agricultural activities has caused 70 per cent of planetary biodiversity loss and half the loss of tree cover globally to date.[47]

Habitat fragmentation is the process during which a large expanse of habitat is transformed into many patches of a smaller total area that are isolated from each other.[48]

Extensive land conversion, deforestation and habitat fragmentation are not only catastrophic for ecosystem health, they also increase interactions between humans and wildlife. Globally between 1945 and 2005, land-use change has contributed to almost half of zoonotic disease events emerging in humans.[49] For example, extensive deforestation and fragmentation in West and Central Africa is linked to several Ebola outbreaks in these regions *(see case study 2)*. Forest fragmentation brings wildlife into closer contact with humans in areas where wildlife and people increasingly share the same spaces and compete for the same resources.[50] Likewise, human encroachment into ecosystems such as forests may increase the number and density of host species in forest fragments, increasing the likelihood of interactions with humans.

CASE STUDY 2: THE ROLE OF DEFORESTATION IN EBOLA OUTBREAKS IN WEST AND CENTRAL AFRICA

Suspected host species:

Fruit bats (reservoir), primates (intermediate) [51]

Number of deaths:

11,325 (2014-2016 outbreak)[52] ; 2,268 (2018-2020 outbreak)[53]

Estimated economic impact:

US$2.8 billion in lost GDP for affected countries,[54]

US$5.9-8.9 billion global support[55] (2014-2016 outbreak)

Over the last 20 years, there have been numerous Ebola outbreaks in West and Central Africa. The virus is highly infectious and often fatal, with a mortality rate of around 50 per cent. The largest outbreak in recent years started in Guinea in 2014 and then moved across land borders to Sierra Leone and Liberia.[56] During this outbreak, 11,325 people died from Ebola[57] and 17,300 children lost one or both parents to the virus.[58]

Although it is difficult to trace the exact drivers for these specific outbreaks, many researchers have directly linked the rates of deforestation in West and Central Africa to an increased likelihood of Ebola outbreaks. In deforestation fronts in these regions, forest loss is rapidly increasing at a rate already higher than 0.5 per cent per year. In the Guinean forests, which span West Africa, the cultivation of crops including cacao, palm oil and rubber is driving extensive forest clearance and widespread fragmentation.[59] The Congo Basin, which contains 20 per cent of the world's tropical forests, is losing over 1 million hectares of tree cover per year, driven by increasing smallholder forest clearance for agriculture as well as large-scale commercial logging.[60,61] Rapid deforestation risks leaving these ecosystems severely fragmented and degraded.

Researchers believe that the extensive deforestation in these regions increases contact between humans and potential Ebola host species, such as fruit bats and primates, leading to greater potential for transmission from hosts to humans.[62] The underlying assumption is that transmission is more likely in fragmented forests due to an increased density of some host species and closer proximity between humans and those host species.[63] For example, some researchers have shown that the number of tropical fruit bats may increase in fragmented habitats (while insectivorous bats decrease), and the density of some primate populations may also increase following habitat disturbance.[64] Likewise, fragmentation creates more entry points for humans to venture into natural habitats to hunt or forage.[65] Although the mechanisms of Ebola transmission are not certain, it is highly plausible that humans living close to fragmented forest edges have greater exposure to zoonotic diseases due to an increased risk of contact with host species.

The 2014-2016 Ebola outbreak had devastating social and economic impacts. Researchers estimate that economic losses were equivalent to around US$2.8-32.6 billion in lost GDP for the three affected countries – Sierra Leone, Guinea and Liberia.[66] In addition, more than 33 weeks of education were lost due to school closures,[67] and production volumes of staple crops were reduced by 12 per cent.[68] More recently, 2,268 people died during the 2018-2020 Ebola virus outbreak in Democratic Republic of the Congo.[69]

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Bats and zoonotic disease emergence

Bats are frequently implicated in the emergence of new zoonotic diseases. More than 200 viruses have been associated with bats, and there have been six major outbreaks of zoonotic diseases in the past 25 years that scientists suspect were caused by bat-borne viruses, including the COVID-19 pandemic.[70]

Bats are natural reservoir hosts since they can carry high viral loads and shed viruses without becoming sick themselves.[71] Bats also roost in colonies that can contain tens of millions of individuals, enabling viruses to spread rapidly. Because they are highly mobile, bats can carry viruses to many types of habitats, including urban areas, and potentially expose many other species, including both domestic animals and humans. Other animals can be infected in multiple ways through exposure to the blood, saliva, urine or faeces of bats.[72]

Despite these risks, culling bats will not prevent future zoonotic disease outbreaks and may even increase the risk of a zoonotic disease spilling over to humans. Previous culls have been unsuccessful, with culls in Latin America failing to reduce rabies prevalence[73] and attempts to cull bats in Uganda leading to increased prevalence of Marburg virus in the region.[74,75] Culls can drive bat populations to migrate to new areas, facilitating the spread of disease. In addition, increased physiological stress may increase the amount of virus that bats shed.[76] By culling bats, there is also a risk of further disrupting ecosystems. In particular, bats are essential for insect control and plant pollination, with over 300 species of fruit dependent on bats for pollination.

When land is cleared for agriculture, wildlife and livestock risk coming into closer proximity, creating conditions for disease transmission into intermediate hosts. Since most land is converted for agricultural and livestock production, there is also a growing level of contact between wildlife and livestock animals. If farms lack sufficient bio-safety regulations to limit livestock contact with external species, these animals risk becoming intermediate disease hosts. This can assist with the genetic rearrangement of a virus into a form that can be transmitted to humans, as was the case during the 1997 Nipah virus outbreak (*see case study 3*).[77,78] Intensified livestock farming practices can facilitate the rapid spread of disease among animals, due to their proximity. Small-scale or subsistence farming can also be dangerous if not sufficiently regulated through bio-safety protocols. Greater precautions must be taken with livestock production to prevent these dangerous spillover events.

CASE STUDY 3: THE ROLE OF AGRICULTURE AND LIVESTOCK PRODUCTION IN THE NIPAH VIRUS OUTBREAK IN 1998

Suspected host species:
Fruit bats (reservoir), pigs (intermediate) [79]

Number of deaths:
105 (1998 outbreak)[80]; 260 (2001-2018)[81]

Estimated economic impact:
US$671 million (1998 outbreak)[82]

Nipah is a relatively unknown virus, which was first reported in 1998 during an outbreak among pig farmers in Malaysia. Despite receiving relatively little media attention, the World Health Organization has listed Nipah virus as one of the 10 most important pathogens to monitor and research to reduce the risk of a future pandemic.[83] The virus is often fatal in both pigs and humans, with a 40 per cent mortality rate during the initial outbreak in Malaysia that resulted in 105 deaths, mostly of farm labourers working on pig farms.[84]

Research suggests that the spillover of Nipah from bats to pigs and then to humans during the 1998 outbreak likely resulted from the intensification of pig husbandry and mango production.[85] Between the 1970s and the 1990s, both pig and mango production tripled in Malaysia, encroaching into natural ecosystems.[86] Farmers typically planted mango trees alongside pig enclosures, which attracted fruit bats (known carriers of the virus) to the area. Scientists believe that pigs may have consumed fruit contaminated with bat saliva or urine, leading to the spillover of the virus.[87]

At the farm where the first cases occurred, thousands of pigs were kept in close proximity, and likely with limited bio-safety regulations, enabling rapid transmission of the virus within the population and resulting in the spillover to humans on the farm. Although the pathways to widespread circulation in humans are complex, it seems likely that the dual production of mangos and pigs in intensified conditions created the right scenario for multiple spillover events.

Subsequent outbreaks of Nipah in Bangladesh and India have led to a further 260 deaths, with an average mortality rate of 75 per cent.[88] In 1998, one million pigs were culled as a result of the outbreak, driving the Malaysian pig industry to near collapse and resulting in US$671 million of economic losses.[89]

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The pressure on nature from food systems will continue increasing as the challenges of feeding the growing population expands. Finding sustainable solutions to ensure food security for a growing global population is a key challenge of the 21st century, with the world population projected to reach nearly 10 billion by 2050. Based on current trends, global food demand is expected to increase anywhere between 59 per cent to 98 per cent by 2050.[90] The world's current unsustainable food systems mean that instead of repurposing degraded land for sustainable agricultural use, forests, savannahs and grasslands continue to be destroyed.[91] Encroaching on natural habitats puts humanity at a higher risk of exposure to diseases from wildlife. Moreover, growing demand will likely lead to further intensification of agricultural production with the potential for increased spillover from wild animals into livestock.[92] It will be necessary to find sustainable ways to meet this demand for food, while protecting ecosystem and human health.

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3. THE OUTCOMES: THE COSTS OF HUMANITY'S BROKEN RELATIONSHIP WITH NATURE

THE COSTS OF HUMANITY'S BROKEN RELATIONSHIP WITH NATURE

3. THE OUTCOMES

COVID-19 and other recent pandemics have exposed the grave dangers linked to exploiting high-risk wildlife and encroaching on nature, with tragic costs for communities around the world.

COVID-19 is a devastating wake-up call that humanity's broken relationship with nature affects not only the wildlife and natural ecosystems whose habitats are being destroyed, but also threatens human health. By continuing to damage natural habitats, humans risk incurring the terrible costs of new zoonotic diseases, as well as increased exposure to other threats such as climate change.

The devastating health impacts of recent pandemics including COVID-19 are a stark illustration of the human costs of the encroachment on nature. Some infectious zoonotic diseases can spread rapidly around the world, resulting in human tragedy on a global scale. Between December 2019 and May 2020, over six million people globally contracted COVID-19, with more than 370,000 deaths recorded.[93] This grim total is set to rise, with an additional 190,000 people likely to die in Africa alone,[94] and will almost certainly surpass other deadly outbreaks experienced in recent decades such as the swine flu[95] pandemic in 2009, in which up to 575,400[96] people may have lost their lives (*see Figure 4)*.

Unless the root drivers of zoonotic disease emergence are addressed, the global economy and food security will come under further threat. The costs of COVID-19 are estimated to reach between US$2.4 trillion and US$8.8 trillion,[97] or up to three times the size of the GDP of the UK (*see Figure 5)*.[98,99] Due to the disruption caused by the pandemic and the necessary response measures put in place by governments, the global economy is projected to contract by 3 per cent in 2020,[100] and almost half of the global workforce is in immediate danger of losing their livelihoods.[101] The drastic social and economic shifts driven by COVID-19 are also threatening global food security. It has been warned that the number of people at risk of acute hunger after the pandemic could rise from 135 million to 265 million by the end of the year,[102] due to disruption in food supply chains, movement and transport restrictions, and reductions in people's purchasing power. Further, COVID-19 may be the worst but is certainly not the only recent pandemic with a devastating economic impact on countries or regions. SARS resulted in an estimated 1 per cent decrease in China's GDP and a 0.5 per cent decrease in Southeast Asia, damaging all sectors of the economy.

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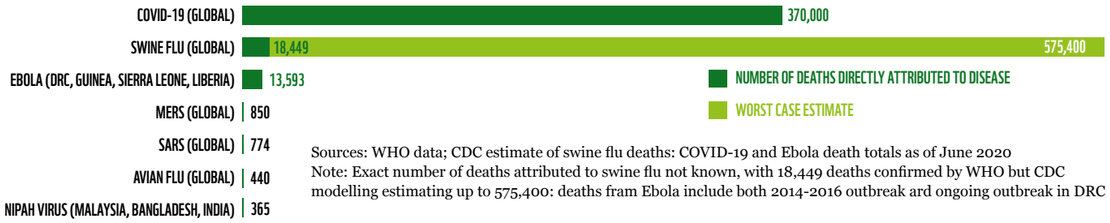
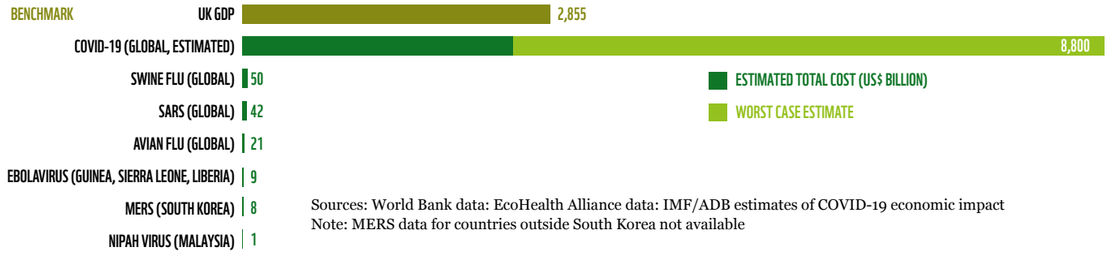
The increased risk of new zoonotic diseases such as COVID-19 poses a threat to already marginalized groups, including indigenous communities and women. COVID-19 has highlighted that indigenous peoples can be particularly vulnerable to the health and economic impacts of pandemics. For example, in the Navajo Nation of North America, the reported COVID-19 infection rate is 10 times higher than the general population of Arizona.[103] Likewise, in Brazil, COVID-19 has affected at least 34 indigenous communities, many of which live in areas with no health facilities.[104] Lockdowns and travel restrictions have also disproportionately affected indigenous people, as many work in the informal economy and rely on income from markets, handicrafts, seasonal work and tourism to support themselves.[105] For example, many of the Batwa people of Uganda, usually reliant on income through offering low-cost labour, have lost their livelihoods due to lockdown measures.[106] Furthermore, the economic and social impacts of pandemics such as COVID-19 have a clear gender bias. Throughout the COVID-19 pandemic, there have been widespread reports of surges in gender-based violence, as women are confined with their abusers during quarantine. For every three months that lockdowns continue, an additional 15 million cases of gender-based violence are expected.[107] In addition, many women now have lower access to key health services including sexual and reproductive health, as well as maternal, new-born and child health services.[108,109]

FIGURE 4: NUMBER OF DEATHS FROM MOST FATAL EMERGING ZOONOTIC DISEASES (1998-2020)



Sources: WHO data; CDC estimate of swine flu deaths: COVID-19 and Ebola death totals as of June 2020
Note: Exact number of deaths attributed to swine flu not known, with 18,449 deaths confirmed by WHO but CDC modelling estimating up to 575,400: deaths fram Ebola include both 2014-2016 outbreak ard ongoing outbreak in DRC

FIGURE 5: ESTIMATED COST OF MOST FATAL EMERGING ZOONOTIC DISEASES (1998-2020)



Sources: World Bank data: EcoHealth Alliance data: IMF/ADB estimates of COVID-19 economic impact
Note: MERS data for countries outside South Korea not available

Pandemics can threaten global and national peace and security, increasing the urgency for public institutions to address their drivers. Although the COVID-19 crisis has resulted in short-term ceasefires in some regions, tensions have escalated in other volatile areas. As governments redeploy security personnel to tackle the health crisis and foreign countries recall troops stationed in-country, violent attacks by extremist groups in hotspots in sub-Saharan Africa increased by 37 per cent between March and April. In particular, Boko Haram launched the group's deadliest attack against Chad's army since its insurgency spread into Chad.[110,111] The long-term political and economic effects of pandemics may pose an even greater threat to global stability. COVID-19 and the associated lockdown measures threaten national stability, particularly in fragile states, which already faced severe economic and political instability prior to the pandemic.[112] On the global stage, geopolitical rivalries between countries are set to worsen, as countries grapple with differing economic impacts of the COVID-19 crisis.[113]

Moreover, pandemics can further endanger the natural world, with environmental monitoring and enforcement already suffering as a result of COVID-19. In Brazil, the federal environmental agency has announced cuts to enforcement duties, which include protecting the Amazon from accelerating deforestation, resulting in increased threats from illegal logging and land conversion.[114] The loss of the tourism sector is further depleting funding for monitoring and enforcement in protected and community conservation areas, resulting in increases in encroachment, illegal logging, and poaching in some areas.[115,116,117] Further, pressures from the crisis have led governments and companies to relax regulations and sustainability efforts. The US Environmental Protection Agency announced it would not enforce environmental reporting requirements for those with a "COVID-related justification.".[118] Similarly, China has extended deadlines for companies to meet environmental standards and delayed the scheduled development of a large solar farm.[119]

The rapid spread of new zoonotic diseases also poses a grave threat to wildlife and ecosystem dynamics. Many endangered primates such as gorillas died during numerous Ebola outbreaks in Gabon and the Democratic Republic of the Congo between 1997 and 2004, with mortality rates of up to 97 per cent in some gorilla populations.[120] During avian flu outbreaks over recent decades, mass deaths among wild birds from different species have been reported around the world.[121] Zoonotic disease outbreaks can damage natural ecosystems, affecting prey populations, biodiversity, and the delivery of ecosystem services.[122]

The same forces driving increased pandemics are also furthering environmental degradation through climate change and biodiversity loss. Food and land-use systems currently cause up to 30 per cent of total greenhouse gas emissions, contributing to climate change.[123,124] Widespread land conversion and deforestation disrupts the vital role of ecosystems in capturing and storing greenhouse gases. When forests are cleared or burned, they release greenhouse gases into the atmosphere, contributing to rising global temperatures. Agricultural production processes further contribute to global warming with high levels of greenhouse gas emissions associated with fertilizer use, energy consumption and livestock production.[125] This in turn creates further risks to human health, with climate change set to increase deaths from heat strokes, malnutrition and disease transmission.[126] Over the coming decades, emissions driven by food systems are predicted to increase, generating further climate shifts and resulting in severe repercussions for the health of both humans and nature.[127]

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4. THE OPPORTUNITY: WHY THIS MOMENT IS A KEY OPPORTUNITY FOR TRANSFORMATIVE CHANGE

WHY THIS MOMENT IS A KEY OPPORTUNITY FOR TRANSFORMATIVE CHANGE

4. THE OPPORTUNITY

Limited progress has been made in tackling high-risk wildlife trade, and deforestation and fragmentation, despite numerous interventions attempting to address these issues.

Some governments and private sector actors are increasingly committed to protecting terrestrial ecosystems and biodiversity, in line with the Sustainable Development Goal (SDG) 12 (Sustainable Production and Consumption) and SDG 15 (Life on Land). However, the 2019 SDG Progress Report noted that despite these initiatives, the overall trends of land degradation and biodiversity loss are continuing at an alarming rate.[128] Similarly, the Progress Assessment of the New York Declaration on Forests (NYDF) on ending deforestation and restoring forestlands found "little evidence that these goals are on track, and achieving the 2020 targets is likely impossible".[129]

State-driven policies and regulations have taken important steps in regulating land-use change but have faced significant challenges with enforcement. Several national governments have designated protected areas in their countries, safeguarding these lands from changes in use. Globally, 15 per cent of land area is currently protected, falling just short of the 17 per cent target set for 2020 by the Convention on Biological Diversity (CBD) under the Aichi Biodiversity Targets.[130] However, protection varies significantly across key deforestation fronts, with less than 5 per cent of land protected in New Guinea and Liberia, compared to over 50 per cent in Venezuela.[131] Effective management of protected areas also varies, as some national or jurisdictional governments face challenges with enforcement capacity and many protected and conserved areas remain chronically underfunded. Fewer than 20 per cent of countries have met their commitment to assess the management of protected areas.[132] Similarly, although indigenous peoples and local communities (IPLCs) own around 50 per cent of the world's land, governments only legally recognize around 10 per cent, meaning that these communities do not have representation in environmental decision-making. This failure to recognize IPLC rights reduces the essential role that they can play in protecting this land from deforestation and fragmentation.[133]

With regard to wildlife trade, most countries have regulations to ensure the safety and hygiene of legal trade but monitoring and enforcement remains an issue. Customs and trade bureaus struggle to identify wildlife subject to trade controls, and there is a lack of accountability for those violating trade laws and safety regulations.[134] Further, in the absence of effective enforcement, illegal trade may increase. A ban on live poultry exports from Thailand following the avian influenza H5N1 virus led to the growth of illegal poultry trade which contributed to the rapid spread of the disease in unregulated Cambodian markets.[135]

The business sector has increasingly supported market-based initiatives, such as voluntary company actions, but significant scale and impact are lacking. Market-based approaches include voluntary commitments to improve supply chains (e.g., environmental assurance systems, certification systems, traceability and monitoring of suppliers), as well as monetary incentives for conservation outcomes (e.g., payment for environmental services schemes and sustainable finance). The adoption of voluntary commitments, particularly certification schemes, is growing among supply chain actors, but overall is still small scale, particularly for companies sourcing cattle or soy.[136] As of May 2019, 481 companies have made 850 commitments to address deforestation in their supply chains, but only a small proportion of those exposed to soy or beef have made a commitment.[137] Commitments are concentrated among consumer-facing businesses, while upstream actors face lower incentives to participate. Market segmentation allows buyers to focus on supply chain actors with no environmental commitments. Even well-intentioned companies and investors may find it difficult to monitor their suppliers and investments, given lengthy supply chains and multiple levels of aggregation of products. As a result, the NYDF Progress Assessment noted in 2019 that *"the private sector is not on track to eliminate deforestation from agricultural production."*[138]

Finally, there is a lack of global coordination and no accountability mechanisms to address the environmental drivers of pandemics. The REDD+[139] scheme is one of the most prominent examples of an international framework, aimed at reducing emissions of greenhouse gases through avoided deforestation, forest conservation or sustainable forest management. Many countries have integrated their REDD+ strategies within their nationally determined contributions, or their stated efforts to reduce national emissions.[140] However, investments in stopping deforestation in tropical countries comprise less than 1.5 per cent of the support committed by multilateral institutions and developed country donors since 2010 (only US$3.2 billion out of US$256 billion). Similarly,

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the implementation of the 20 Aichi Biodiversity Targets, developed by the CBD, has stalled due to governance challenges within national jurisdictions, a lack of funding for environmental agencies, corruption and a lack of participation from civil society.[141] On the issue of illegal and high-risk wildlife trade, global monitoring mechanisms lack the ability to regulate species that are considered high-risk for public health reasons. The United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) focuses on the trade of species but lacks a mandate or focus on zoonotic risks.

The current crisis demonstrates that to make true progress on these issues, systemic change is required. Whether tackling environmental issues, health crises or economic challenges, solutions with a single focus or leverage point are unlikely to be successful, given the deep interconnections of different systems. Cross-cutting responses are required, such as promoting more sustainable and efficient food systems, encouraging healthier and more sustainable diets, reducing overproduction and consumption, and moving towards nature-positive and climate-neutral financial systems that incorporate environmental risks in their decision-making processes. These solutions must be coordinated between different actors, including governments, the private sector, the public, IPLCs, and environment, animal and health specialists, leading to a general societal shift to embrace a healthier relationship with the planet.

The COVID-19 crisis is a pivotal moment, in which the world can and must take action. By tackling the key drivers of illegal and high-risk wildlife trade and by increasing the sustainability of food systems through eliminating deforestation and conversion from supply chains, stakeholders have the power to make transformative changes to reduce the impact of environmental drivers on human health. There is an opportunity to make these changes by seizing key policy moments in 2020/2021. 2020 was dubbed a "super year for Nature", and despite some delays and cancellations due to the COVID-19 crisis, many critical events for driving transformational shifts will still take place, including the UN Biodiversity Summit. Now is the moment to reframe humanity's relationship with nature, reduce the risk of new zoonotic diseases emerging and recommit to the 2030 Agenda for Sustainable Development.

Now, more than ever, public support is aligned toward driving forward a new sustainability agenda. As governments are faced with the challenges of rebuilding economies, stakeholders can work together to fix humanity's broken relationship with nature. Globally, there is increasing momentum to introduce new environmental regulations to reduce the future threats from pandemics. New WWF-commissioned research shows that there is overwhelming public support across Southeast Asia for a ban on illegal and unregulated wildlife markets and decreasing willingness to buy and consume wildlife. Similarly, a recent polling of public opinion in 14 countries found that 65 per cent of respondents supported a "green economic recovery" process that would prioritize the environment and climate change within it.[142] A similar phenomenon was observed in the US, as public support for climate change mitigation measures significantly increased following exposure to natural disasters linked to climate change.[143] It is therefore essential to build on the momentum created by the COVID-19 crisis to tackle illegal and high-risk wildlife trade and unsustainable food systems. Now is the moment to seize the opportunity to "build back better". This includes agreeing a New Deal for Nature and People to halt and reverse the loss of nature and biodiversity towards a nature-positive world by 2030.

COVID-19 has also demonstrated the power of global responses to solve urgent challenges. By the end of March 2020, over 100 countries worldwide had instituted comprehensive response programmes. Government investments in response and stimulus packages have been unprecedented, representing 20 per cent of GDP in Germany (€750 billion), to 10 per cent of GDP in the US (US$2 trillion).[144] There have also been significant shifts in the way that individuals and communities behave, from respecting social distancing where possible, to hundreds of thousands of people volunteering to support community members and the crisis response.[145] The combination of governmental and individual action demonstrates that by investing in crisis responses and changing behaviour, humanity can take positive steps to mitigate urgent threats to human health. An unparalleled opportunity now exists to address the unsustainable pressures that are being placed on the environment, which are risking the health of current and future generations.

5. THE PATH FORWARD: A NEW DEAL FOR NATURE & PEOPLE TO RESTORE HUMANITY'S RELATIONSHIP WITH NATURE

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5. THE PATH FORWARD

Urgent action is necessary to address the planetary emergency and to reduce the risk of future pandemics through systemic changes that create a more sustainable relationship with nature.

Now is the time for the world to take immediate steps to prevent future pandemics, and to support systemic changes that will protect the health of both the planet and people over the long term.

Governments, businesses and financial institutions need to take fundamental, systemic action to reverse the loss of nature, and put nature on a path to recovery to create a nature positive world by 2030. Below are three recommendations which are essential elements of a New Deal for Nature and People, and will help avoid future pandemics:

Recommendation 1: Stop illegal, unregulated and high-risk wildlife trade and consumption

Immediate action: Stop high-risk wildlife trade. Policymakers should take steps to halt the sale and trade of high-risk wildlife species, which creates dangerous opportunities for zoonotic disease spillover.

These actions include:

- Shutting down the trade and sale of high-risk wildlife within markets and enforcing hygienic and safe practices across markets and restaurants, with a priority focus on those in high-density urban areas.
- Scaling up efforts to combat the trade of illegal and high-risk species at national and international levels.
- Increasing coordination between public health, enforcement and environmental agencies at local and national levels.
- Supporting the development of sustainable and resilient businesses to support those who currently rely on high-risk species as a protein or income source and ensuring biosafety standards are respected if establishing new animal farming operations.

Systemic action: Influence consumer behaviour to reduce wildlife demand, and support safety standards. Ensure the long-term viability of trade and safety regulations by reducing consumer demand for wildlife and enforcing standards.

These actions include:

- Strengthening government and civil society efforts to reduce consumer demand for high-risk wildlife products, particularly among those for whom wildlife is considered a delicacy, through broad public education and evidence-based campaigns targeting known consumer groups.
- Enforcing robust regulations on live wild and domestic animal and food hygiene standards.
- Preventing high-risk trade from shifting into black markets and improving national enforcement mechanisms against illegal trade through monitoring and adoption of enforcement best practices.

Recommendation 2: Support sustainable food systems that halt encroachment on nature

Immediate action: Limit the impacts of COVID-19 on people and nature by ensuring agricultural deforestation and conversion does not increase as immediate food security is pursued. Respond to the negative effects of the COVID-19 crisis on the environment and on communities reliant on ecosystem services for their livelihoods.

These actions include:

- Reinforcing governments' efforts to maintain environmental protections, to strengthen regulations during this crisis, and to protect funding for environmental programmes, including effective and equitable management of protected and conserved areas.
- Maintaining and strengthening existing voluntary environmental measures from private sector actors, including companies and finance providers, to eliminate deforestation and ecosystem conversion from their food supply chains.
- Supporting local communities to obtain alternative sources of livelihoods and working with these communities to strengthen monitoring and reporting of deforestation and land conversion to prevent illegal encroachment, particularly in areas that have lost their normal source of finance for forest protection, such as those dependent on tourism revenue.

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Systemic action: Work across supply chains to increase the sustainability of food systems and to ensure the healthy functioning of natural ecosystems. Strengthen regulations and incentives to shift demand toward commodities that are produced, processed and traded safely and sustainably, considering risks to the environment and human health and avoiding new deforestation or conversion of natural ecosystems. This includes demand-side governments and businesses taking more responsibility to put in place and uphold regulations and making sustainable choices across the supply chain, as well as greater collaboration on the supply side to transition to more sustainable and safer practices.

These actions include:

- Demand-side governments showing global leadership by developing and enforcing policies/legislation to eliminate deforestation and conversion from supply chains and create a consistent market for sustainably sourced commodities, (for example, the EU where potential for such legislation is emerging at the moment) while also partnering with supply-side governments to support their transition to sustainable production.[146,147]
- Companies eliminating deforestation and land conversion from their supply chains, by making timebound and measurable commitments with credible plans to achieve them. This includes adopting deforestation- and conversion-free sourcing and trade policies in line with the guidance of the Accountability Framework initiative (AFi), and reporting transparently on progress.[148] Beyond their own supply chains, companies should advocate for deforestation- and conversion-free policies and invest in the landscapes that they source from, collaborating with local platforms to support the transition to deforestation-and conversion-free landscapes.[149,150]
- Collaborating with global platforms that promote food system transformation to stimulate pre-competitive action to eliminate deforestation and conversion from sourcing practices.
- Promoting financial and technical support for local action in deforestation fronts from corporate, bilateral and national sources. This should include facilitating effective land-use planning and governance to combat conversion and fragmentation, developed in conjunction with IPLCs to respect their land and water rights.[151]
- Developing local solutions to landscape-specific risks, including expanded networks of effectively and equitably managed protected and conserved areas, which respect biosafety standards, have alternative financing mechanisms that are more resilient to shocks, and recognize IPLC land and water rights.[152]
- Shifting the public to more sustainable diets and food choices by raising awareness of the impact on nature and climate, incorporating environmental health into governmental dietary guidelines, and working with businesses to support sustainable dietary patterns.

Recommendation 3: Build a more sustainable relationship between people and nature through sustainable and just economic recovery approaches with defined and holistic goals

Immediate action: Develop economic recovery packages that respond to immediate needs while building long-term resilience. Governments are developing and distributing unprecedented stimulus recovery packages. These must deliver social and economic benefits to all, particularly the most vulnerable, as well as ensure sustainable livelihoods. It is essential that these investments are linked to positive action for climate, nature and the Sustainable Development Goals, and do not support or subsidize sectors that are highly polluting or that pose a threat to natural ecosystems. For example, the EU has announced a stimulus plan of €750 billion, equivalent to 4 per cent of its members' total GDP, to be driven by the European Green Deal.[153] Similarly, Japan has announced a US$1.1 trillion stimulus package to support a sustainable recovery,[154] and New Zealand has announced NZ$1.1 billion for "nature-based jobs"[155].

These actions include:

- Linking stimulus packages and public investments to positive action for climate and nature in line with the Sustainable Development Goals, with incentives and support for climate-smart, nature-based solutions, a circular economy, green jobs and sustainable livelihoods.
- Using stimulus packages to help local communities develop alternative livelihood opportunities, especially in the tourism sector, that build sustainability and resilience while protecting their rights.
- Tightening regulation on sectors receiving support to ensure subsidies and bailouts are not used to boost polluting industries such as oil, gas, aviation and other sectors that harm the environment. Support should be made conditional on companies committing to preventing deforestation and land conversion, ensuring a low-carbon transition in line with the Paris Agreement, and protecting the rights of IPLCs.[156]
- Providing debt relief in a way that supports economic resilience through investment in a sustainable, low-carbon development trajectory.
- Measuring the impact of different recovery plans on nature and the climate through existing impact tools.[157]
- Increasing efforts to implement the CBD Aichi Biodiversity Targets.

Systemic action: Governments, businesses and financial institutions need to commit to ambitious targets to halt and reverse the loss of nature. COVID-19 has demonstrated the value of nature to human health, economies and societies. Following the pandemic, it will be essential for governments, businesses and the financial sector to better integrate the Sustainable Development Goals into their planning and activities. Governments and other stakeholders should support ambitious and measurable environmental targets, mobilizing adequate and consistent resources for global action to halt and reverse the loss of nature by 2030 and achieve the 1.5°C target of the UNFCCC's Paris Agreement. The UN Summit on Biodiversity in September 2020 and key global environmental decisions in 2021, including the post-2020 Global Biodiversity Framework under the CBD and enhanced NDCs before the UNFCCC COP26, are unmissable opportunities.

These actions include:

- Sending a strong political signal to heads of state and government at the UN Summit on Biodiversity in September 2020, ahead of major global environmental decisions in 2021 for the health of people and planet.
- Committing to a New Deal for Nature and People that promotes a nature-positive world by 2030 and includes three goals:[158]
  - **Protect and restore natural habitats:** Secure the world's remaining natural spaces, by protecting 30 per cent of land and ocean, and sustainably managing the rest, with emphasis on community- and indigenous-led conservation and sustainable management
  - **Safeguard the diversity of life:** Halt the unprecedented rate of extinction and the sharp decline of wildlife populations by protecting and restoring habitats and curbing unsustainable fishing, hunting and wildlife trade.
  - **Halve the footprint of production and consumption:** Reduce humanity's negative ecological impacts by greening the main economic drivers of nature loss: agriculture, fishing, infrastructure, extractive industries, forestry and energy production.
- Ensuring strong accountability and transparency mechanisms for the implementation and achievements of global goals through the post-2020 Global Biodiversity Framework under the CBD.
- Aligning public and private financial flows with the implementation of an ambitious post-2020 Global Biodiversity Framework and enhancing governments' NDCs with nature-based solutions by:
  - Eliminating or repurposing all incentives and subsidies harmful to biodiversity, and urgently aligning public and private financial flows with the pathway towards a nature-positive, carbon-neutral and equitable society.[159]
  - Increasing public and private investments in nature, and accounting for and improving transparency around impacts on nature and associated risks in all financial flows,[160] including in emergency economic recovery and stimulus packages.
  - Focusing on a transformational shift that would allow for nature-positive, carbon-neutral and wellbeing-centred economic models, including the need for alternative macro-economic indicators.
- Mobilizing the corporate sector to make commitments and ramp up credible action to reduce the negative environmental footprint of key sectors and to translate corporate targets into positive environmental impact.
- Working with financial institutions to incorporate both climate and nature risks, such as the multiple impacts of deforestation and fragmentation, in their investment decisions. Initial actions include implementing better data and traceability systems to track the impacts of their funds on supply chains and developing new channels for green finance.

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