



COVID-19 RESPONSE AND RECOVERY

Nature-Based Solutions for People, Planet and Prosperity

Recommendations for Policymakers

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Executive Summary

COVID-19 highlights the critical connection between the health of nature and human health. This connection must be better reflected in our priorities, policies and actions. The root causes of this pandemic are common to many root causes of the climate change and biodiversity crises. Confronting these intertwined crises requires an integrated approach and unprecedented cooperation to achieve an equitable carbon-neutral, nature-positive economic recovery and a sustainable future. Our organizations' recommendations to policymakers for meeting this challenge are offered below.

I. Halt degradation and loss of natural ecosystems as a public health priority

Human activities are destroying, degrading and fragmenting nature at an unprecedented rate, directly affecting our resilience to future pandemics. By throwing ecosystems off balance, human activities have turned natural areas from our first line of defense into hot spots for disease emergence. Reversing this trend is critical for preventing the next pandemic long before it can enter human communities.

- ▶ Halt degradation and loss of natural forests and other critical habitats, by controlling and containing unsustainable natural resource exploitation and expansion of agriculture and infrastructure.
- ▶ Put in place demand-side policies and regulations to address the consumption of commodities associated with a high risk of deforestation and ecosystem degradation and conversion.
- ▶ Secure legal recognition and effective protection of the land tenure, access and use rights of Indigenous Peoples and local communities (IPLCs).
- ▶ Establish legally secure and effectively managed protected areas and support the implementation of other effective conservation measures including indigenous and community-conserved areas.
- ▶ Restore degraded lands to improve ecological integrity and economic productivity with a focus on increasing connectivity of natural areas and enhancing sustainable intensification of agriculture.
- ▶ Intensify international cooperation and finance to conserve and restore ecological integrity of natural ecosystems and address the drivers of ecosystem degradation, fragmentation and conversion.

II. Reform livestock production to reduce zoonotic pandemic risk

Expansion of livestock production and trade, much of it taking place on frontiers of wildlife habitat, has intensified interactions between people, livestock and wild animals and thereby increased risks of zoonotic disease spillover to both humans and livestock. Reforms in how livestock are produced and traded are a critical element of a strategy to reduce the risk of future zoonotic disease pandemics.

- ▶ Enact controls to mitigate risks posed by large concentrations of livestock in confined spaces (e.g., markets and slaughterhouses), including sanitary, environmental and labor best practices.

- ▶ Strengthen and enforce improved veterinary, sanitary, registration and traceability regulations and standards in livestock supply chains from producer to consumer.
- ▶ Work with pastoral communities and livestock enterprises near natural ecosystem frontiers to minimize disease risks arising from interactions between humans, livestock and wildlife.
- ▶ Reduce overall meat and dairy consumption and production globally, while pursuing improved nutrition, human health and social equity for those people and places where this is deficient.

III. Reduce zoonotic disease risk posed by commercial wildlife trade and markets

The trade in wild animals – including hunting, butchering, transporting, handling and marketing for human consumption and other uses – creates a serious risk of zoonotic spillover that must be stringently and effectively managed by agencies responsible for both wildlife, environment and public health.

- ▶ Enact measures to end or stringently regulate hunting, butchering, transporting, handling and marketing of wild animals for human consumption and other uses, based on the best available scientific information regarding likely pathways and risks of zoonotic disease emergence and spread.
- ▶ Strengthen investigative, law enforcement and judicial capacities and processes to detect, suppress and sanction illegal wildlife trafficking.
- ▶ Launch science-based public awareness and social marketing campaigns explaining the risk of hunting, butchering, transporting and handling of live animals for consumption and of wild meat.
- ▶ Ensure that the rights of IPLCs engaged in traditional hunting practices are respected, and that those practices which are sustainable are not penalized.
- ▶ Increase international financing for developing countries to implement measures to end – or stringently regulate – commercial trade in wildlife for human consumption and other uses.
- ▶ Address the risk of zoonotic disease with a One Health approach through existing or new international arrangements, working with UN bodies, the private sector, NGOs and scientific centers of expertise.

IV. Protect recent conservation investments in the face of COVID-19 pressures

The pandemic and its impacts on economies, mobility and policy are impeding implementation of billions of dollars in conservation investments, threatening recent biodiversity conservation gains. Governments must act quickly to safeguard these investments until the situation stabilizes and work can resume.

- ▶ Provide support to rangers and other management personnel to avoid a vacuum in protected area management that could be exploited by poachers targeting endangered or protected wildlife.

- ▶ Support landowners, including smallholder producers and Indigenous Peoples, to ensure their commitments and rights are not undermined, and risks of illegal encroachment are minimized.
- ▶ Provide emergency support to help ensure the well-being and food security of vulnerable communities managing or living in or near protected and conserved areas.
- ▶ Provide short-term support to local communities engaged in wildlife- and nature-based tourism in globally-important sites to ensure that the enterprises are sustained.
- ▶ Maintain and strengthen support for monitoring, managing and reporting wildlife trade and for combating wildlife trafficking.
- ▶ Maintain or strengthen environmental laws that protect natural ecosystems and protected areas and regulate potential threats.

V. Enact policies and strategies for a nature-positive COVID-19 economic recovery

Protecting nature is not just important for pandemic prevention; it is also critical for financial recovery from COVID-19. We must “build back better” from the present crisis protecting nature and making nature-positive investments that will ensure sustainable economic recovery and secure people’s livelihoods.

- ▶ Avoid relaxation of environmental regulations in the name of COVID-19 stimulus and recovery.
- ▶ Maintain political space and rights for civil society and the press to serve an effective transparency and monitoring function regarding recovery and stimulus policies.
- ▶ Provide income support to reduce the risk of poverty-induced encroachment into nature.
- ▶ Attach green conditionalities to corporate bailouts, especially for sectors with a high impact on nature.
- ▶ Systematically apply spatial planning across landscapes and seascapes to harmonize nature protection with sustainable economic development.
- ▶ Repurpose subsidies and other public support towards activities that conserve nature and incentivize nature-based solutions to post-pandemic economic recovery and restructuring.
- ▶ Invest in innovative technologies that will enable more efficient and effective conservation and sustainable use of natural resources.
- ▶ Create an enabling policy environment for private sector investment and innovation, including promotion of market mechanisms to finance nature-based solutions.
- ▶ Invest in human capital, especially young people, to develop the skills and entrepreneurial mindset required to seize opportunities related to a nature-positive economy.
- ▶ Mobilize enhanced public international development cooperation to support a just and sustainable economic recovery.

Introduction

COVID-19 highlights the critical connection between the health of nature and human health, and the centrality of this connection needs to be better reflected in our priorities and policies, and in the urgency of our actions. The root causes of this pandemic are common to some of the root causes of the climate change and biodiversity crises. Confronting these intertwined crises requires an integrated approach and unprecedented cooperation to achieve an equitable carbon-neutral, nature-positive economic recovery and a sustainable future.

In the course of just a few months, the COVID-19 pandemic has seized the attention of the world and has become a top priority for policymakers. The impacts on human health and the global economy have been devastating, straining public health and financial systems to the point of breaking, threatening food security (Laborde et al. 2020; WEF 2020a) and throwing social and economic inequalities into sharp relief.

The pandemic has hit a world that is already facing a planetary emergency due to the inter-related global crises of climate change, the degradation of natural ecosystems and the accelerating loss of biodiversity. We are losing the natural environment at an unprecedented rate and experiencing a sixth mass extinction of species with an estimated 1 million species at risk (Ceballos et al. 2020; IPBES 2019). Our planet is currently warming at alarming rates (IPCC 2018). The nature and climate crises reinforce each other and exacerbate other crises for human well-being including extreme events, poverty, inequality, illness and hunger.

The zoonotic origin of the coronavirus has highlighted the consequences of disrupting the balance between humanity and nature at the scale we have seen over the past century. Natural ecosystems are deteriorating under the stress of habitat loss and modification due to agricultural and urban expansion, climate change, pollution and overexploitation of species (IPBES 2019), increasing the risk of further zoonotic disease pandemics (UNEP 2020; Evans et al. 2020, Soubelet et al. 2020; Plowright et al. 2020). The pandemic has especially highlighted the serious risk posed by commercial markets and trade in wildlife for human consumption.

COVID-19 is not the first of these zoonotic diseases – nor is it likely to be the last. Reviews of the science suggest that deforestation, natural habitat degradation and fragmentation and wildlife trade are factors behind the increase in spillover of these zoonoses to people from animals and the root cause of pandemics such as COVID-19 (Soubelet et al. 2020). At the same time, the sudden economic downturn precipitated by the pandemic has highlighted the fragility of the “safety net” we have tried to put in place to conserve nature. And as we grapple with the enormity of “building back better” from this calamity, many of the most effective and cheapest solutions may lie in protecting, conserving and restoring nature (Business for Nature 2020; Conservation International 2020; Dasgupta et al. 2020; Dobson et al. 2020).

We represent a group of 22 non-governmental and intergovernmental organizations with mandates at the nexus of environmental protection, the conservation of nature and the promotion of sustainable development. Our mandates and approaches are diverse, but we are united in the understanding that valuing, conserving, sustainably managing, restoring nature – and empowering its stewards – must be an integral part of COVID-19 response and recovery, and that governments must establish bold policies and take resolute action to make this a reality. Civil society, business and industry and science stand ready to help, but without steadfast leadership by government at all levels, we cannot prevail.

Incorporating nature into COVID-19 response and recovery is not only good for nature. As leaders struggle for effective responses to both the public health and economic dimensions of this crisis, evidence shows us that nature-based solutions can provide governments with a potent and cost-effective set of tools and strategies for building back better (Waldron et al. 2020; WEF 2020b). By “nature-based solutions”, we refer to strategies that both harness the diversity and resilience of nature to address both the health and economic dimensions of this crisis while at the same time maintaining and restoring the stability and diversity of Earth’s natural ecosystems and climate upon which human prosperity so heavily depends (IUCN 2020).

We join together to offer overarching recommendations for policymakers on the critical role of nature in responding to and recovering from the COVID-19 pandemic and its social and economic consequences, whilst also ensuring that such a zoonotic pandemic never happens again. These guidelines are meant as a high-level roadmap; more detailed advice and resources can be found in the materials produced by our organizations and others in the bibliography and by way of links throughout the document.

I. Halt degradation and loss of natural ecosystems as a public health priority

Human activities are destroying, degrading and fragmenting nature at an unprecedented rate, directly affecting our resilience to future pandemics. By throwing ecosystems off balance, human activities have turned natural areas from our first line of defense into hot spots for disease emergence. Reversing this trend is critical for preventing the next pandemic long before it can enter human communities.

RECOMMENDATIONS

- ▶ Halt fragmentation, degradation and loss of remaining natural forests and other critical natural habitats, with a focus on controlling key drivers, including the expansion of commercial agriculture and livestock production, industrial-scale logging, mining and fossil fuel extraction and development of roads and other infrastructure.
- ▶ Put in place demand-side policies and regulations to address the consumption of commodities associated with a high risk of deforestation and ecosystem conversion.
- ▶ Secure the legal recognition and effective protection of the land tenure, access and use rights of Indigenous Peoples and local communities (IPLCs) to enable and empower their stewardship of traditional lands and resources.
- ▶ Establish legally secure and effectively managed protected areas and support the implementation of other effective area-based conservation measures – including indigenous and community-conserved areas – to conserve the extent and integrity of remaining natural ecosystems including sites of special significance for biodiversity and associated ecosystem services (e.g. Key Biodiversity Areas).
- ▶ Accelerate efforts to restore degraded lands to improve ecological integrity and economic productivity with a focus on reducing the fragmentation and edge effects that create human-wildlife contact zones, establishing ecological corridors and buffer zones connecting protected and conserved areas as well as enhancing sustainable intensification of agricultural production outside of intact ecosystems and key biodiversity areas.
- ▶ Intensify international cooperation to increase financing from all sources (public, private, domestic and international) to conserve and restore the ecological integrity of natural ecosystems and address the drivers of ecosystem conversion and deforestation.

RATIONALE

Human activities are destroying, degrading and fragmenting natural areas at an unprecedented rate (IPBES 2019). Degradation has significantly altered ecological systems worldwide and continues to expand into new areas (Evans et al. 2020). This continuing crisis directly affects our resilience to future pandemics: by throwing ecosystems off balance, human activities have turned natural areas from our first line of defense into hot spots for disease emergence. Reversing this trend is critical for preventing the next pandemic long before it can enter human communities (Doshi and Gentile 2020).

Ecological degradation increases the overall risk of zoonotic disease outbreaks originating from wildlife. This relationship has been shown for multiple individual diseases, in regional and global multi-disease studies and in theoretical models, although the proportion of cases of degradation that lead to substantially increased risk is not well understood. The increased risk results from multiple interacting pathways including increased human contact with pathogens and disruption in pathogen ecology (Evans et al. 2020).

While spillover events generally occur in the most human-dominated systems (e.g., urban areas), these tend to be of known zoonotic diseases, or variants of these, so are more easily managed and controlled. The greatest pandemic risk comes from spillover of a novel or emerging zoonotic disease for which we are unprepared in terms of understanding its ecology or having vaccinations or treatments in place (as COVID-19 demonstrates).

The key factors that accentuate the risk of an emerging infectious disease (EID) spillover event include:

- ▶ land conversion and consequent creation of new habitat edges;
- ▶ logging and other extractive activities;
- ▶ wildlife hunting, trade and consumption; and
- ▶ agricultural and livestock intensification.

When those disturbances take place in or near high-biodiversity areas, they result in higher rates of contact between humans, livestock and certain wildlife species. With greater and faster traffic of people and animals (and therefore hosts, pathogens and vectors) in and out of these areas and around the world, we have a global system of interconnected drivers that both facilitates spillover of new infections from wildlife and increases the potential for those emergence events to become much larger regional and global epidemics (Jones et al. 2020).

Hence, avoiding ecosystem degradation (by keeping ecosystems as intact as possible and avoiding the creation of high-risk interface zones and high-risk activities that increase human-wildlife contact), combined with broader One Health approaches that address the full range of risk factors and are integrated into public health policies, will help to reduce the risk to humanity from emerging zoonoses and can have other beneficial health outcomes as well. Protecting ecological integrity should be a priority action within any comprehensive plan to avoid future zoonotic outbreaks, through actions such as spatial planning¹, the creation and management of effective protected areas, support to ecosystem management by IPLCs and policies to minimize threats caused by particular economic sectors (Evans et al. 2020).

¹ More specifically, the prevention and mitigation of zoonotic disease risk can be materially improved by a “landscape immunology” approach that addresses the entire “infect, shed and spread” chain of a causation of zoonotic disease pandemics. (Plowright et al. 2020).

IPLCs play a key role in many countries in protecting and sustainably managing the lands they hold and use – on average, biodiversity loss has been less severe or avoided in these areas. (IPBES 2019). Securing their land tenure, access and use rights, valuing local indigenous knowledge and ensuring their full and effective participation in relevant processes is thus critical for protecting nature and hence reducing risks of future zoonotic pandemics. This is particularly important since IPLCs have been disproportionately affected by the COVID-19 pandemic and its consequences (Letzing 2020).

Agricultural expansion continues to be the main driver of deforestation and forest degradation and the associated loss of forest biodiversity (FAO 2020). The more we understand about the causal linkages between forest disturbance and increased risks of the emergence of novel zoonotic diseases, the more urgent it becomes to reduce the impact of agricultural production on nature. Demand signals for sustainably produced commodities from key markets and increased support to producer countries to address the root causes of deforestation and ecosystem degradation should be prioritized.

The political basis for conserving nature is well-established in international agreements, most notably the Convention on Biological Diversity and in the UN Sustainable Development Goals (SDGs). SDG 15 calls on States and peoples to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.” Achieving SDG 15 is particularly important because of the ecosystem services that underpin human well-being in many ways. Current trends in biodiversity and ecosystem degradation undermine progress towards 80% of the SDGs related to poverty, hunger, health, water, cities, climate, oceans and land (IPBES 2019).

This approach is reflected in the EU’s “European Green Deal”, for which the European Commission in May 2020 released the EU Biodiversity Strategy for 2030, stating:

Healthy and resilient societies depend on giving nature the space it needs. The recent COVID-19 pandemic makes the need to protect and restore nature all the more urgent. The pandemic is raising awareness of the links between our own health and the health of ecosystems. It is demonstrating the need for sustainable supply chains and consumption patterns that do not exceed planetary boundaries. This reflects the fact that the risk of emergence and spread of infectious diseases increases as nature is destroyed. Protecting and restoring biodiversity and well-functioning ecosystems is therefore key to boost our resilience and prevent the emergence and spread of future diseases.

A similar approach, published in Science (Dobson et al. 2020), proposes that a modest investment of just over \$30 billion by the G7 & China would pay for itself hundreds of times over. Areas of focus would include community health and forest conservation in areas at high risk of virus emergence, 30% reduction in new forest edge associated with disease transmission, early detection of virus spillover, eradication of outbreaks of new viral diseases and cleanup of high disease-risk wildlife trade and markets.

II. Reform livestock production to reduce zoonotic pandemic risk

Expansion of livestock production and trade, much of it taking place on frontiers of wildlife habitat, has intensified interactions between people, livestock and wild animals and thereby increased risks of zoonotic disease spillover to both humans and livestock. Reforms in how livestock are produced and traded are a critical element of a strategy to reduce the risk of future zoonotic disease pandemics.

RECOMMENDATIONS

- ▶ Enact control measures to mitigate the risk posed by large concentrations of livestock in confined spaces (e.g., wholesale and retail livestock markets and slaughterhouses), including sanitary, environmental and labor best practices.
- ▶ Strengthen and enforce improved veterinary, sanitary, registration and traceability regulations and standards in livestock supply chains from producer to consumer.
- ▶ Work with pastoral communities and livestock enterprises near the frontiers of natural ecosystems to minimize risks of EID emergence and spread arising from the interactions between humans, livestock, predators and other wildlife.
- ▶ Enact policies to reduce overall meat and dairy consumption and production globally, while at the same time pursue improved nutrition, human health and social equity for those countries and sectors of society where this is deficient.

RATIONALE

In the last 50 years, the demand for animal protein and wildlife products has greatly increased, along with the growth in human population and increased affluence in many hitherto deprived regions, intensifying human-animal and human-wildlife-livestock interaction through livestock production, wildlife farming, and trade of live wildlife (often sold in markets alongside live livestock and other domestic animals) across the globe. This intensification has facilitated pathogen spillover from wildlife to livestock and increased the likelihood that livestock become intermediate hosts in which pathogens are transmissible to humans. Many wildlife species have thrived in this transitional landscape and have become reservoirs for disease in livestock and humans (WWF 2020a).

Producing food for an expected population of 10 billion people by 2050—and the associated increase of land converted to food and livestock production—will create even greater human-livestock, human-wild animal and livestock-wild animal contact rates, increasing the likelihood of spillover events. Given that approximately 70% of emerging infectious diseases and almost all recent pandemics originate from animals, there is a growing call to reevaluate how animal source food is produced (WWF 2020a).

Policies to reduce health and disease risks associated with current livestock production systems need to address five areas of risk:

- ▶ First, intensive farming systems provide the ideal conditions for zoonoses to evolve, multiply and spill over to people. Such intensive (and also less intensive) livestock rearing also poses a considerable health risk regardless of spillover, being a main source of antibiotic resistance, which could create epidemics from known but currently manageable diseases or reduce our ability to fight emerging infectious diseases.

- ▶ Second, small-scale livestock husbandry also has its risks, for example in the case of unregulated small-scale poultry/pig/fish farming in Asia which can increase contact between livestock, human waste and wildlife and therefore the risk of spillover to livestock and people (as in the case of Nipah virus).
- ▶ Third, extensive grazing often results in conflict with – and persecution of – large predators by farmers, which alters the natural equilibrium and results in the proliferation of smaller mammal predators and pests which are the types of species more likely to bring pathogens close to people and livestock.
- ▶ Fourth, trade in live domestic animals is a major infection route (as in the case of avian influenza) particularly in parts of the world where refrigerated transport and storage are limited.
- ▶ Finally, the livestock sector is plagued by illegal activity, causing major gaps in efforts to manage health and disease risk.

III. Reduce zoonotic disease risk posed by commercial wildlife trade and markets

The trade in wild animals – including all aspects of hunting, butchering, transporting, handling and marketing for human consumption and other uses – creates a serious risk of zoonotic spillover that must be stringently and effectively managed by agencies responsible for wildlife and environment as well as public health.

RECOMMENDATIONS

- ▶ Enact legislation or regulations to end or stringently and effectively regulate hunting, butchering, transporting, handling and marketing of wild animals (particularly live birds and mammals) for human consumption and other uses, based on the best available scientific information regarding likely pathways and risks of zoonotic disease transmission from wildlife to humans.
- ▶ Strengthen investigative, law enforcement and judicial capacities and processes to detect, suppress and sanction illegal wildlife trade.
- ▶ Launch science-based public awareness and social marketing campaigns explaining the risk of hunting, butchering, transporting and handling of live animals for consumption and of wild meat.
- ▶ Ensure that the rights and needs of IPLCs engaged in traditional hunting practices are respected, and that those hunting practices which are sustainable and not connected to commercial wildlife trade are not penalized by suppression measures, in particular:
 - Where IPLCs are affected by restrictions on hunting and trade, put in place compensatory policies and measures to ensure a just and healthy transition to sustainable livelihoods and food security, and the recognition and effective protection of IPLC's land and water rights.
 - Where IPLCs do hunt and consume wildlife, ensure that appropriate health and safety awareness, education, training and protective equipment are available to help guarantee their health and safety.

- ▶ Increase international bilateral and multilateral financing to assist developing countries in implementing policies and measures to end or stringently and effectively regulate commercial trade in wildlife for human consumption and other uses, and where necessary (such as in central Africa) ensure a sustainable and affordable supply of alternatives to wild meat to support food security.
- ▶ Address the risk of zoonotic disease with a One Health approach at national and international levels, through existing or potentially new international arrangements, agreements, or protocols, working with, *inter alia*, relevant UN and other international agreements and agencies, as well as private sector, NGO and civil society centers of expertise.

RATIONALE

The trade in wild animals – including all aspects of hunting, butchering, transporting, handling and marketing for human consumption and other uses – creates a serious risk of zoonotic spillover that must be ended or stringently and effectively managed.

The COVID-19 global pandemic has highlighted the issue of commercial wildlife trade and its potential role in increasing both the risk and severity of zoonotic disease outbreaks. Based on presently available data, the SARS-CoV-2 virus, which causes COVID-19, is presumed to have spilled over at a wildlife market interface in Wuhan, China. The ancestral host is most likely one of the horseshoe bat species. The intermediary or amplification host is unknown at this time (Evans et al. 2020), but a range of mammal and bird species are known to have transmitted zoonoses to humans (Kümpel et al. 2015; Jones et al. 2020).

The commercial wildlife trade and associated live animal markets are important risk factors for initial zoonotic disease spillover and transmission (WWF 2020a; Evans et al. 2020; Quinney 2020; UNODC 2016) and then for such a spillover event to turn into a pandemic. Transmission risk is linked to the condition and state of the wildlife being traded; spillover is most likely to occur where live, stressed animals (which are more likely to shed viral loads) are transported and held in close proximity to other species, including livestock and humans (Jones et al. 2020). Those handling and butchering wildlife or wild meat without adequate precautions (such as market traders) are also at risk of blood or other bodily fluid-borne zoonoses such as Ebola (Kümpel et al. 2015). In terms of an outbreak leading to an epidemic or pandemic, the risk increases where live animals (carrying live zoonotic pathogens, both of which can stay viable for long periods/distances) are dispersed widely from the often remote natural ecosystems where they are captured to centers of human population (though there is also a significant zoonotic spillover risk from animals that are bred in wildlife farms and not removed directly from the wild).

The rate of emergence of novel zoonotic infectious diseases has been increasing in recent decades, with spillovers from both wild (both wild-caught and captive bred) and domestic animals. Although the COVID-19 pandemic is devastating, future pandemics could be far worse. The COVID-19 fatality rate is much lower than other zoonotic diseases like Ebola and Nipah. If a future zoonotic emerging infectious disease emerging in a major population and transport hub like Wuhan were to combine high transmission rates during the asymptomatic phase with higher fatality rates, the consequences would be even more devastating (WWF 2020a).

The legality of wildlife trade is not directly related to zoonotic infection; zoonoses operate according to biological rather than legal criteria, and there are rarely legal controls in place aimed at addressing zoonotic risk. The prevalence of illegal wildlife trade in many countries, however, complicates the task of effectively managing the commercial wildlife markets and trade for human consumption that have been the proximate cause of the COVID-19 pandemic.

Given the risks, ending or stringent and effective regulation of commercial trade and markets in wildlife for human consumption needs to become a fundamental international norm and should be integrated into countries' legal frameworks and public health policies. Such measures should focus on commercial markets and cover both domestic and international trade.

It is important, however, to take into account the dependence of many Indigenous Peoples and otherwise traditional rural communities on wild meat and focus in the first instance on eradicating wild meat consumption linked to urban areas and to a luxury commercial trade – rather than focusing on subsistence hunting for household consumption (Fa and Nasi 2020; Coad et al. 2019; Kümpel et al. 2015). This supports the livelihoods and food security of vulnerable groups while focusing intervention on the areas of greatest zoonotic pandemic risk.

IV. Protect recent conservation investments in the face of COVID-19 pressures

The pandemic and its impacts on economies, mobility and policy are impeding implementation of billions of dollars in conservation investments, threatening recent biodiversity conservation gains. Governments must act quickly to safeguard these investments until the situation stabilizes and work can resume.

RECOMMENDATIONS

- ▶ *Protected area management* – Provide support to rangers and other management personnel to avoid creating a vacuum in enforcement and management effectiveness that could be exploited by poachers targeting endangered or otherwise protected wildlife. Ensure continuity of both monitoring of key ecosystems and species and of the ability to respond to infractions.
- ▶ *Habitat conversion and degradation* – Avoid deforestation and other types of ecosystem conversion and degradation, and support landowners, including smallholder producers and Indigenous Peoples, to ensure their commitments and rights are not undermined, and risks of illegal encroachment are minimized.
- ▶ *Vulnerable local communities* – Provide emergency support to help ensure the well-being and food security of vulnerable communities managing or living in or near protected and conserved areas.
- ▶ *Community-based tourism* – Provide short-term support to local communities engaged in wildlife-based tourism in globally-important sites to ensure that the enterprises are sustained to secure wildlife populations and local livelihoods.
- ▶ *Illegal wildlife trade* – Maintain and strengthen support to entities engaged in monitoring, managing and reporting wildlife trade in supply, transit and demand countries, and to entities engaged in enforcement and judicial measures to combat wildlife trafficking.
- ▶ *Conservation legislation* – Maintain or strengthen existing environmental laws that protect natural ecosystems and protected areas and regulate potential threats (e.g., mining, habitat conversion, illegal hunting, over-exploitation, infrastructure development).
- ▶ *Detection of potential future pandemics* – Help ensure increased development and funding of programs designed to detect, predict and help prevent future zoonotic pandemics (e.g., the Global Virome Project).

RATIONALE

The COVID-19 pandemic has forced countries into various degrees of lockdown, including physical distancing and confinement, closed borders, suspension or lack of enforcement of environmental laws and restricted movement of personnel. This will inevitably lead to suspensions or delays of recent investments seeking to tackle threats to natural ecosystems and associated drivers. It is also likely such delays will undermine or negate gains made in safeguarding biodiversity and ecosystem degradation or impede any future progress when the situation stabilizes, and work can resume.

Affected activities are likely to include protected area management, enforcement of regulations to curb illegal wildlife exploitation and trade, support to local communities involved in conservation activities such as wildlife tourism and the promotion of deforestation-free commodity supply chains. Gains that have been achieved under these investments could be lost if remedial actions are not taken quickly and decisively.

The global tourist industry is forecast to contract by up to 25% in 2020, while the total cost of COVID-19 to the African tourism and travel sector could be \$50 billion and 2 million direct and indirect jobs. The collapse of nature-based tourism threatens to compromise decades of development and conservation work. For communities dependent on tourism for their income the next few months are critical to saving not only livelihoods, but decades of community welfare and conservation gains.

When tourism stops, so do many of the economic incentives for conservation. It is therefore vital that protected areas – the economic infrastructure of nature tourism – are maintained so that there will still be nature to visit in the future. Until tourism becomes viable again, governments should support key organizations in priority conservation areas through targeted grants to private sector enterprises, community-based organisations and conservation NGOs. It is crucial to provide incentives for their staff, indirect dependents and other members of the local community to maintain the integrity and functioning of natural ecosystems in protected and conserved areas.

In the longer term, it will be important to invest in helping both the travel industry and communities dependent on nature tourism to recover, diversify livelihoods and economies, accelerate green growth, and invest in clean energy, sustainable food production and nature-sensitive infrastructure development.

V. Cross-cutting policy measures for a nature-positive COVID-19 recovery²

Policy recommendations in previous sections focus on actions that policymakers should take to reduce risks of future zoonotic pandemics by improving how we handle livestock production and wildlife trade and by safeguarding nature. However, investing in and protecting nature are not just important for pandemic prevention; they are also an important for financial recovery from COVID-19. A broader and longer-term matrix of policy measures and initiatives to “build back better” from the present public health and economic crisis is needed and nature-positive investments will provide returns in the form of jobs and long-term economic gains.

² Most of these recommendations draw on WEF 2020b, which contains much more detailed recommendations.

RECOMMENDATIONS

- ▶ **Avoid relaxation of environmental regulations in the name of COVID-19 stimulus and recovery.** Some governments are relaxing environmental protection and enforcement policies as part of their COVID-19 economic stimulus and recovery packages. This approach is unwise and short-sighted as it provides very limited – if any – emergency economic stimulus and undermines commitments on climate change, nature conservation and the protection of public health, and undermines future nature-based tourism development or recovery.
- ▶ **Shift toward a Nature-Positive Economy.** Recent economic analysis indicates that industry actions that have a positive impact on nature could generate as much as \$10.1 trillion in new opportunities for business, 395 million new jobs by 2030 (WEF 2020b). Focusing on ecosystem services, renewable energy and green infrastructure are all part of the equation.
- ▶ **Maintain political space and rights for civil society and the press to serve an effective transparency and monitoring function regarding recovery and stimulus policies.** Some governments have used the pandemic as a pretext to suppress rights of free expression and political action. Responsible governments must avoid this tendency and should unite in opposing such actions by other governments.
- ▶ **Provide income support to reduce the risk of poverty-induced encroachment into nature.** Governments should ensure that safety nets are in place, through social protection schemes (including cash and voucher transfers) targeting the poorest and most vulnerable to food and nutrition insecurity – reducing the need for these populations to rely on forests and other natural ecosystems and wildlife for their food security or livelihoods.
- ▶ **Attach green conditionalities to corporate bailouts, especially for sectors with a high impact on nature.** Relevant policy areas include company bailouts, stimulus incentives (e.g., taxation, subsidy and tariffs), regulation of capital markets, infrastructure investments and policy and investment priorities for multilateral development banks (Levy *et al.* 2020; Seymour *et al.* 2020)
- ▶ **Systematically apply spatial planning across landscapes and seascapes to harmonize nature protection with sustainable economic development.** To be effective, spatial planning needs to engage communities, business, local government and other stakeholders, be based on the best available science and data and take place within a clear legal framework that ensures that the process is transparent and that there are accountability mechanisms in place to monitor outcomes.
- ▶ **Repurpose subsidies and other public support towards activities that conserve nature and incentivize nature-based solutions to post-pandemic economic recovery and restructuring.** Of more than \$700 billion paid in agricultural subsidies each year, only 15% of this support goes towards building public goods.³ Similarly, \$30 billion of public support is poorly targeted at fisheries, with around \$22 billion of this classified as harmful. Such subsidy regimes undermine natural capital stocks, endangering biodiversity, long-term job stability and livelihoods as well as local and global ecosystem services.
- ▶ **Invest in innovative technologies that will enable more efficient and effective conservation and sustainable use of natural resources.** Recent technological advances now enable near-real time remote monitoring of land use changes to detect

³ The amount of subsidies aimed at “public goods” is captured by the OECD definition of General Services Support Estimates, that is “public financing of services that create enabling conditions for the agricultural sector”.

and prevent illegal deforestation and encroachment, illegal fishing, mining and other harmful activities as well as assist with spatial planning. Materials identification (e.g. DNA, stable isotope analysis) and supply chain logistics technology advances now allow for robust systems to make supply chains more transparent and to enable easier detection of violations and anomalies.

- ▶ **Create an enabling policy environment for private sector investment and innovation, including promotion of market mechanisms as a way to finance nature-based solutions.** We are already seeing a significant growth in the interest of private actors in financing “green” and “blue” carbon and other ecosystem services in forests, peatlands, mangroves and other natural ecosystems. These markets have the potential to scale to billions of dollars of financing for nature over the coming decade.
- ▶ **Invest in human capital, especially young people, to develop the skills and entrepreneurial mindset required to seize opportunities related to a nature-positive economy.** The world young people faced just a year ago was already changing at an unprecedented rate. The pandemic has radically accelerated the pace and direction of change. This young generation will need a substantially new set of skills to confront and adapt to a post-COVID-19 world already reeling from climate change and biodiversity loss.
- ▶ **Mobilize enhanced public international development cooperation to support a just and sustainable economic recovery.** Wealthier “donor countries” are currently preoccupied with their own battle against the coronavirus and its economic impacts, but they should not allow the present crisis to compromise the need for sustained international development assistance to poorer countries who are also grappling with this on top of other long-term challenges. This is not only the right thing to do; it is also in everyone’s self-interest, including those in wealthier nations, in our globally interdependent world.

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