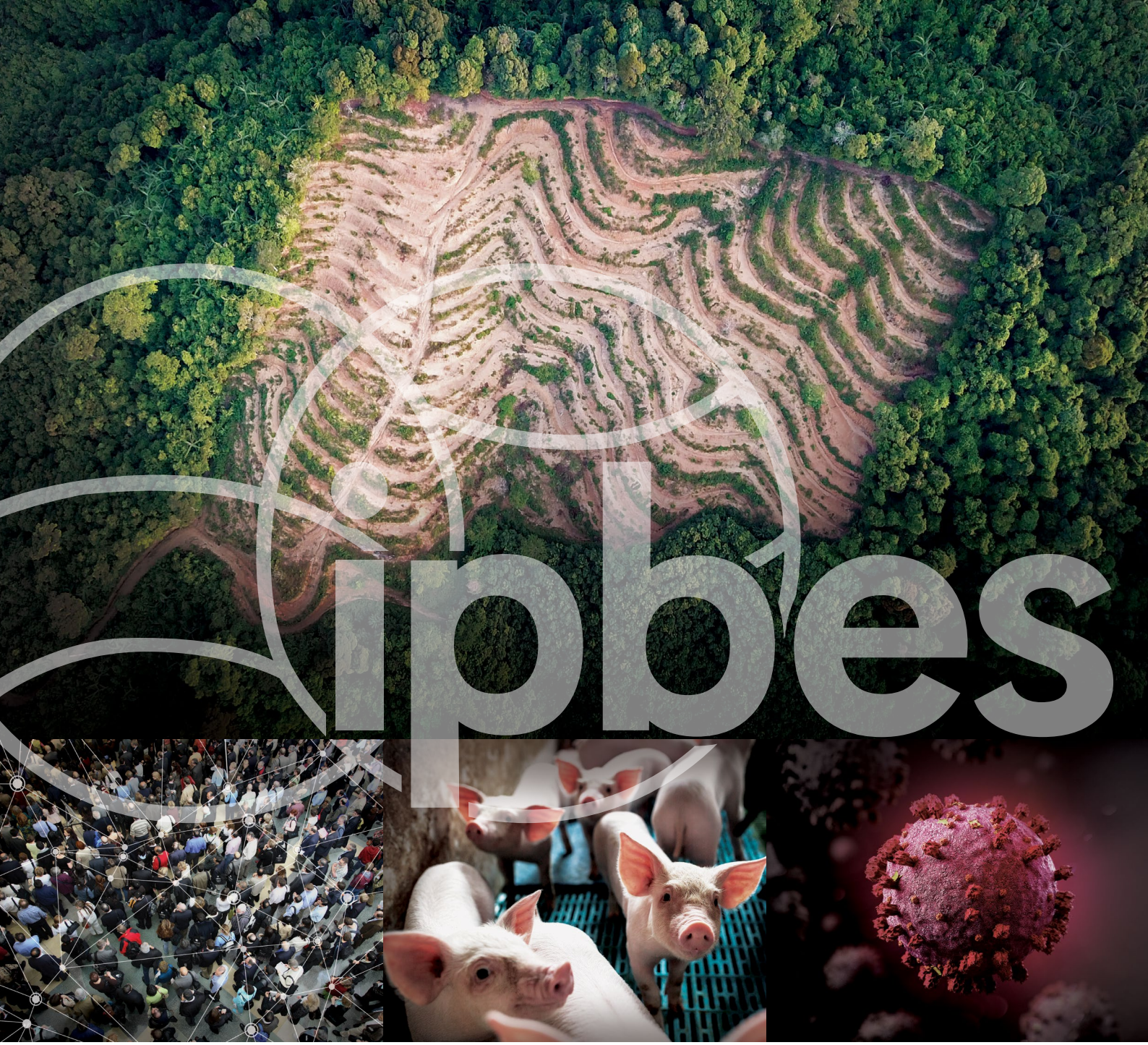

IPBES WORKSHOP ON BIODIVERSITY AND PANDEMICS

EXECUTIVE SUMMARY

Intergovernmental Platform on
Biodiversity and Ecosystem Services

ipbes

The IPBES Bureau and Multidisciplinary Expert Panel (MEP) authorized a workshop on biodiversity and pandemics that was held virtually on 27-31 July 2020 in accordance with the provisions on “Platform workshops” in support of Plenary-approved activities, set out in section 6.1 of the procedures for the preparation of Platform deliverables (IPBES-3/3, annex I).

This workshop report and any recommendations or conclusions contained therein have not been reviewed, endorsed or approved by the IPBES Plenary.

The workshop report is considered supporting material available to authors in the preparation of ongoing or future IPBES assessments. While undergoing a scientific peer-review, this material has not been subjected to formal IPBES review processes.

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Intergovernmental Platform on
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PREAMBLE

The IPBES Bureau and Multidisciplinary Expert Panel, in the context of the extraordinary situation caused by the COVID-19 pandemic, and considering the role that IPBES can play in strengthening the knowledge base on biodiversity, decided that IPBES would organize a "Platform workshop" on biodiversity and pandemics, in accordance with the procedures for the preparation of IPBES deliverables, in particular decision IPBES-3/3, annex I, section 6.1. on the organization of Platform workshops.

This workshop provided an opportunity to review the scientific evidence on the origin, emergence and impact of COVID-19 and other pandemics, as well as on options for controlling and preventing pandemics, with the goal to provide immediate information, as well as enhance the information IPBES can provide to its users and stakeholders in its ongoing and future assessments.

The workshop brought together 22 experts from all regions of the world, to discuss 1) how pandemics emerge from the microbial diversity found in nature; 2) the role of land use change and climate change in driving pandemics; 3) the role of wildlife trade in driving pandemics; 4) learning from nature to better control pandemics; and 5) preventing pandemics based on a "one health" approach.

The workshop participants selected by the IPBES Multidisciplinary Expert Panel included 17 experts nominated by Governments and organizations following a call for nominations and 5 experts from the ongoing IPBES assessment of the sustainable use of wild species, the assessment on values and the assessment of invasive alien species, as well as experts assisting with the scoping of the IPBES nexus assessment and transformative change assessments. In addition, resource persons from the Intergovernmental Panel on Climate Change (IPCC), the Secretariat of the Convention on Biological Diversity (CBD), the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the United Nations Convention to Combat Desertification (UNCCD) and the World Health Organization (WHO) attended the workshop.

This workshop report has been prepared by all workshop participants and been subjected to several rounds of internal review and revisions and one external peer review process.

Technical support to the workshop has been provided by the IPBES secretariat.

IPBES thanks the Government of Germany for the provision of financial support for the organization of the workshop and production of the report.

IPBES WORKSHOP ON BIODIVERSITY AND PANDEMICS

EXECUTIVE SUMMARY

Pandemics represent an existential threat to the health and welfare of people across our planet. The scientific evidence reviewed in this report demonstrates that pandemics are becoming more frequent, driven by a continued rise in the underlying emerging disease events that spark them. Without preventative strategies, pandemics will emerge more often, spread more rapidly, kill more people, and affect the global economy with more devastating impact than ever before. Current pandemic strategies rely on responding to diseases after their emergence with public health measures and technological solutions, in particular the rapid design and distribution of new vaccines and therapeutics. However, COVID-19 demonstrates that this is a slow and uncertain path, and as the global population waits for vaccines to become available, the human costs are mounting, in lives lost, sickness endured, economic collapse, and lost livelihoods.

Pandemics have their origins in diverse microbes carried by animal reservoirs, but their emergence is entirely driven by human activities. The underlying causes of pandemics are the same global environmental changes that drive biodiversity loss and climate change. These include land-use change, agricultural expansion and intensification, and wildlife trade and consumption. These drivers of change bring wildlife, livestock, and people into closer contact, allowing animal microbes to move into people and lead to infections, sometimes outbreaks, and more rarely into true pandemics that spread through road networks, urban centres and global travel and trade routes. The recent exponential rise in consumption and trade, driven by demand in developed countries and emerging economies, as well as by demographic pressure, has led to a series of emerging diseases that originate mainly in biodiverse developing countries, driven by global consumption patterns.

Pandemics such as COVID-19 underscore both the interconnectedness of the world community and the rising threat posed by global inequality to the health, wellbeing and security of all people. Mortality and morbidity due to COVID-19 may ultimately be higher in developing countries, due to economic constraints affecting healthcare access. However, large-scale pandemics can also drastically affect developed countries that depend on globalized economies, as COVID-19's impact on the USA and many European countries is currently demonstrating.

Pandemics emerge from the microbial diversity found in nature

- The majority (70%) of emerging diseases (e.g. Ebola, Zika, Nipah encephalitis), and almost all known pandemics (e.g. influenza, HIV/AIDS, COVID-19), are zoonoses – i.e. are caused by microbes of animal origin. These microbes 'spill over' due to contact among wildlife, livestock, and people.

- An estimated 1.7 million currently undiscovered viruses are thought to exist in mammal and avian hosts. Of these, 540,000-850,000 could have the ability to infect humans.

- The most important reservoirs of pathogens with pandemic potential are mammals (in particular bats, rodents, primates) and some birds (in particular water birds), as well as livestock (e.g. pigs, camels, poultry).

Human ecological disruption, and unsustainable consumption drive pandemic risk

- The risk of pandemics is increasing rapidly, with more than five new diseases emerging in people every year, any one of which has the potential to spread and become pandemic. The risk of a

pandemic is driven by exponentially increasing anthropogenic changes. Blaming wildlife for the emergence of diseases is thus erroneous, because emergence is caused by human activities and the impacts of these activities on the environment.

- Unsustainable exploitation of the environment due to land-use change, agricultural expansion and intensification, wildlife trade and consumption, and other drivers, disrupts natural interactions among wildlife and their microbes, increases contact among wildlife, livestock, people, and their pathogens and has led to almost all pandemics.

- Climate change has been implicated in disease emergence (e.g. tick-borne encephalitis in Scandinavia) and will likely cause substantial future pandemic risk by driving movement of people, wildlife, reservoirs, and vectors, and spread of their pathogens, in ways that lead to new contact among species, increased contact among species, or otherwise disrupts natural host-pathogen dynamics.

- Biodiversity loss associated with transformation of landscapes can lead to increased emerging disease risk in some cases, where species that adapt well to human-dominated landscapes are also able to harbour pathogens that pose a high risk of zoonotic transmission.

- Pathogens of wildlife, livestock and people can also directly threaten biodiversity, and emerge via the same activities that drive disease risk in peopl (e.g. the emergence of chytridiomycosis in amphibians worldwide due to the wildlife trade).

Reducing anthropogenic global environmental change may reduce pandemic risk

- Pandemics and other emerging zoonoses cause widespread human suffering, and likely more than a trillion dollars in economic damages annually. This is in addition to the zoonotic diseases that have emerged historically and create a continued burden on human health. Global strategies to prevent pandemics based on reducing the wildlife trade and land-use change and increasing One Health[1] surveillance are estimated to cost between US$40 and 58 billion annually – two orders of magnitude less than the damages pandemics produce. This provides a strong economic incentive for transformative change to reduce the risk of pandemics.

- The true impact of COVID-19 on the global economy can only be accurately assessed once vaccines are fully deployed and transmission among populations is contained. However, its cost has been estimated at US$8-16 trillion globally by July 2020 and may be US$16 trillion in the US alone by the 4th quarter of 2021 (assuming vaccines are effective at controlling it by then).

- Pandemic risk could be significantly lowered by promoting responsible consumption and reducing unsustainable consumption of commodities from emerging disease hotspots, and of wildlife and wildlife-derived products, as well as by reducing excessive consumption of meat from livestock production.

- Conservation of protected areas, and measures that reduce unsustainable exploitation of high biodiversity regions will reduce the wildlife-livestock-human contact interface and help prevent the spillover of novel pathogens.

Land-use change, agricultural expansion, and urbanization cause more than 30% of emerging disease events

- Land-use change is a globally significant driver of pandemics and caused the emergence of more than 30% of new diseases reported since 1960.

- Land-use change includes deforestation, human settlement in primarily wildlife habitat, the growth of crop and livestock production, and urbanization.

- Land-use change creates synergistic effects with climate change (forest loss, heat island effects, burning of forest to clear land) and biodiversity loss that in turn has led to important emerging diseases.

- Destruction of habitat and encroachment of humans and livestock into biodiverse habitats provide new pathways for pathogens to spill over and increase transmission rates.

- Human health considerations are largely unaccounted for in land-use planning decisions.

- Ecological restoration, which is critical for conservation, climate adaptation and provision of ecosystem services, should integrate health considerations to avoid potential increased disease risk resulting from increased human-livestock-wildlife contact.

[1] One Health is an approach that integrates human health, animal health and environmental sectors.

The trade and consumption of wildlife is a globally important risk for future pandemics

- Wildlife trade has occurred throughout human history and provides nutrition and welfare for peoples, especially the Indigenous Peoples and local communities in many countries.
- About 24% of all wild terrestrial vertebrate species are traded globally. International, legal wildlife trade has increased more than five-fold in value in the last 14 years and was estimated to be worth US$107 billion in 2019. The illegal wildlife trade is estimated to be worth US$7-23 billion annually.
- The USA is one of the largest legal importers of wildlife with 10-20 million individual wild animals (terrestrial and marine) imported each year, largely for the pet trade. The number of shipments rose from around 7,000 to 13,000 per month from 2000 to 2015. This trade has led to the introduction of novel zoonoses (e.g. monkeypox) and disease vectors or hosts (e.g. tick reservoirs of the cattle disease heartwater) into the USA.
- Wildlife farming has expanded substantially, particularly in China prior to COVID-19, where 'non-traditional animal' farming generated US$77 billion dollars and employed 14 million people in 2016.
- The farming, trade and consumption of wildlife and wildlife-derived products (for food, medicine, fur and other products) have led to biodiversity loss, and emerging diseases, including SARS and COVID-19.
- Illegal and unregulated trade and unsustainable consumption of wildlife as well as the legal, regulated trade in wildlife have been linked to disease emergence.
- The trade in mammals and birds is likely a higher risk for disease emergence than other taxa because they are important reservoirs of zoonotic pathogens.
- Regulations that mandate disease surveillance in the wildlife trade are limited in scope, disaggregated among numerous authorities, and inconsistently enforced or applied.

Current pandemic preparedness strategies aim to control diseases *after* they emerge. These strategies often rely on, and can affect, biodiversity.

- Our business-as-usual approach to pandemics is based on containment and *control after a disease* has emerged and relies primarily on reductionist approaches to vaccine and therapeutic development rather than on reducing the drivers of pandemic risk to *prevent them before they emerge*.
- Vaccine and therapeutic development rely on access to the diversity of organisms, molecules and genes found in nature.
- Many important therapeutics are derived from indigenous knowledge and traditional medicine.
- Fair and equitable access and benefit sharing derived from genetic resources, including pathogens, have led to more equitable access to vaccines and therapeutics, and broader engagement in research, but some access and benefit sharing procedures may impede rapid sharing of microbial samples.
- Intellectual property is an incentive for innovation, but some have argued it may limit rapid access to vaccines, therapeutics and therapies, as well as to diagnostic and research tools.
- Pandemic control programmes often act under emergency measures and can have significant negative implications for biodiversity, e.g. culling of wildlife reservoirs, release of insecticides.
- Introduction of travel restrictions to reduce COVID-19 spread have severely reduced ecotourism and other income.
- Reduced environmental impacts from economic slowdown during the 'global COVID-19 pause' (e.g. reduced oil consumption) are likely temporary and insignificant in the long term.
- Diseases that emerge from wildlife and spread widely in people may then threaten biodiversity outside the pathogen's original host range.
- Pandemics often have unequal impacts on different countries and sectors of society (e.g. the elderly and minorities for COVID-19). The economic impacts (and disease outcomes) are often more severe on women, people in poverty and Indigenous Peoples. To be transformative, pandemic control policies and recovery programmes should be more gender responsive and inclusive.

Escape from the Pandemic Era requires policy options that foster transformative change towards preventing pandemics:

The current pandemic preparedness strategy involves responding to a pandemic after it has emerged. Yet, the research reviewed in this report identifies substantial knowledge that provides a pathway to predicting and

preventing pandemics. This includes work that predicts geographic origins of future pandemics, identifies key reservoir hosts and the pathogens most likely to emerge, and demonstrates how environmental and socioeconomic changes correlate with disease emergence. Pilot projects, often at large scale, have demonstrated that this knowledge can be used to effectively target viral discovery, surveillance and outbreak investigation. The major impact on public health of COVID-19, of HIV/AIDS, Ebola, Zika, influenza, SARS and of many other emerging diseases underlines the critical need for policies that will promote pandemic prevention, based on this growing knowledge. To achieve this, the following policy options have been identified:

Enabling mechanisms:

- Launching a high-level intergovernmental council on pandemic prevention, that would provide for cooperation among governments and work at the crossroads of the three Rio conventions to:

  1) provide policy-relevant scientific information on the emergence of diseases, predict high-risk areas, evaluate economic impact of potential pandemics, highlight research gaps; and
  2) coordinate the design of a monitoring framework, and possibly lay the groundwork for an agreement on goals and targets to be met by all partners for implementing the One Health approach (i.e. one that links human health, animal health and environmental sectors).

Ultimately the work of the high-level council may lead to countries setting mutually agreed goals or targets within the framework of an accord or agreement. A broad international governmental agreement on pandemic prevention would represent a landmark achievement with clear benefits for humans, animals and ecosystems.

- Institutionalizing One Health in national governments to build pandemic preparedness, enhance pandemic prevention programmes, and to investigate and control outbreaks across sectors.

- Integrating ("mainstreaming") the economic cost of pandemics into consumption, production, and government policies and budgets.

- Generating new green corporate or sovereign bonds to mobilize resources for biodiversity conservation and pandemic risk reduction.

- Designing a green economic recovery from COVID-19 as an insurance against future outbreaks.

Policies to reduce the role of land-use change in pandemic emergence:

- Developing and incorporating pandemic and emerging disease risk health impact assessments in major development and land-use projects.

- Reforming financial aid for land use so that benefits and risks to biodiversity and health are recognized and explicitly targeted

- Assessing how effective habitat conservation measures including protected areas and habitat restoration programmes can reduce pandemics, and trade-offs where disease spillover risk may increase. Developing programmes based on these assessments.

- Enabling transformative change to reduce the types of consumption, globalized agricultural expansion and trade that have led to pandemics (e.g. consumption of palm oil, exotic wood, products requiring mine extraction, transport infrastructures, meat and other products of globalized livestock production). This could include modifying previous calls for taxes, or levies on meat consumption, livestock production or other forms of high pandemic risk consumption.

Policies to reduce pandemic emergence related to the wildlife trade:

- Building a new intergovernmental health and trade partnership to reduce zoonotic disease risks in the international wildlife trade, building on collaborations among the World Organisation for Animal Health (OIE), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity (CBD), the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO); the International Union for Conservation of Nature (IUCN) and others.

- Educating communities from all sectors in emerging infectious diseases hotspots regarding the health risks associated with wildlife use and trade that are known to pose a pandemic risk.

- Reducing or removing species in wildlife trade that are identified by expert review as high-risk of disease emergence, testing the efficacy of establishing market clean-out days, increased cold chain capacity, biosafety, biosecurity and sanitation in markets. Conducting disease surveillance of wildlife in the trade, and of wildlife hunters, farmers, and traders.

- Enhancing law enforcement collaboration on all aspects of the illegal wildlife trade.

Closing critical knowledge gaps on:

- Supporting One Health scientific research to design and test better strategies to prevent pandemics.
- Improving understanding of the relationship between ecosystem degradation and restoration and landscape structure, and the risk of emergence of disease.
- Economic analyses of return-on-investment for programmes that reduce the environmental changes that lead to pandemics.
- Key risk behaviours – in global consumption, in rural communities on the frontline of disease emergence, in the private sector, in national governments – that lead to pandemics.
- Valuing Indigenous Peoples and local communities' engagement and knowledge in pandemic prevention programmes.
- Undiscovered microbial diversity in wildlife that has potential to emerge in future, or to be used to develop therapeutics or vaccines.
- Analysing the evolutionary underpinnings of host shifts that are involved in zoonotic disease spillover and the adaptation of emerging pathogens to new host species.
- Climate change impacts and related extreme weather events (e.g. flooding and droughts) on disease emergence, to anticipate future threats.
- Obtaining data on the relative importance of illegal, unregulated, and the legal and regulated wildlife trade in disease risk.

Foster a role for all sectors of society to engage in reducing risk of pandemics

- Educating and communicating with all sectors of society, and especially the younger generations, about the origins of pandemics.
- Identifying, ranking, and labelling high pandemic risk consumption patterns (e.g. use of fur from farmed wildlife) to provide incentives for alternatives.
- Increasing sustainability in agriculture to meet food requirements from currently available land, and subsequently reduced land areas.
- Promoting a transition to healthier and more sustainable and diverse diets, including responsible meat consumption.
- Promoting sustainable mechanisms to achieve greater food security and reduce consumption of wildlife.
- Where there is a clear link to high pandemic risk, consideration of taxes or levies on meat consumption, production, livestock production or other forms of consumption, as proposed previously by a range of scientific organizations and reports.
- Sustainability incentives for companies to avoid high pandemic-risk land-use change, agriculture, and use of products derived from unsustainable trade or wildlife farming identified as a particular zoonotic disease risk.

Conclusion

This report is published at a critical juncture in the course of the COVID-19 pandemic, at which its long-term societal and economic impacts are being recognized. People in all sectors of society are beginning to look for solutions that move beyond business-as-usual To do this will require transformative change, using the evidence from science to re-assess the relationship between people and nature, and to reduce global environmental changes that are caused by unsustainable consumption, and which drive biodiversity loss, climate change and pandemic emergence. The policy options laid out in this report represent such a change. They lay out a movement towards preventing pandemics that is transformative: our current approach is to try to detect new diseases early, contain them, and then develop vaccines and therapeutics to control them. Clearly, in the face of COVID-19, with more than one million human deaths, and huge economic impacts, this reactive approach is inadequate.

This report embraces the need for transformative change and uses scientific evidence to identify policy options to prevent pandemics. Many of these may seem costly, difficult to execute, and their impact uncertain. However, economic analysis suggests their costs will be trivial in comparison to the trillions of dollars of impact due to COVID-19, let alone the rising tide of future diseases. The scientific evidence reviewed here, and the societal and economic impacts of COVID-19 provide a powerful incentive to adopt these policy options and create the transformative change needed to prevent future pandemics. This will provide benefits to health, biodiversity conservation, our economies, and sustainable development. Above all, it will provide a vision of our future in which we have escaped the current 'Pandemic Era'.

ANNEX I

SCIENTIFIC STEERING COMMITTEE

The Scientific Steering Committee of the workshop was composed of the following members of the IPBES Multidisciplinary Expert Panel:

- **Luthando Dziba**
  (Co-Chair of the Multidisciplinary Expert Panel, South African National Parks, South Africa)

- **Isabel Sousa Pinto**
  (University of Porto, Portugal and Interdisciplinary Centre of Marine and Environmental Research (Ciimar)

- **Judith Fisher**
  (Fisher Research Pty Ltd and Institute of Agriculture, University of Western Australia, Australia)

- **Katalin Török**
  (Centre for Ecological Research, Hungary)

Procedural oversight was provided by members of the IPBES Bureau **Douglas Beard** (United States of America) and **Hamid Custovic** (Bosnia and Herzegovina).

ANNEX II

LIST OF PARTICIPANTS

EXPERTS				
Name	**Role**	**Nominating Government Organization**	**Nationalities**	**Affiliation**
Peter Daszak	Workshop Chair	United States of America	United States of America	EcoHealth Alliance
John Amuasi	Expert	Ghana	Ghana	Kwame Nkrumah University of Science and Technology SPH & Kumasi Centre for Collaborative Research in Tropical Medicine
Peter Buss	Expert	South Africa	South Africa	South African National Parks
Carlos Das Neves	Expert	Norway	Portugal	Norwegian Veterinary Institute
Heliana Dundarova	Expert	Bulgaria	Bulgaria Czechia	Institute of Biodiversity and Ecosystem Research, the Bulgarian Academy of Sciences
Yasha Feferholtz	Expert	Chile	Chile	Resource Mobilization Panel of the Convention on Biological Diversity (CBD), EcoHealth Alliance
Gabor Foldvari	Expert	Hungary	Hungary	Institute of Evolution, Centre for Ecological Research, Hungary
David Hayman	Expert	Massey University	United Kingdom of Great Britain and Northern Ireland	Massey University, New Zealand
Etinosa Igbinosa	Expert	University of Benin, Nigeria	Nigeria	University of Benin, Benin City, Nigeria
Sandra Junglen	Expert	Germany	Germany	Institute of Virology, Charité Universitätsmedizin Berlin, Germany
Thijs Kuiken	Expert	Netherlands	Netherlands	Department of Viroscience, Erasmus University Medical Centre, Rotterdam, The Netherlands
Qiyong Liu	Expert	China	China	Chinese Center for Disease Control and Prevention
Benjamin Roche	Expert	France	France	French National Research Institute for Sustainable Development (IRD)

EXPERTS				
Name	**Role**	**Nominating Government Organization**	**Nationalities**	**Affiliation**
Gerardo Suzan	Expert	Mexico	Mexico	School of Veterinary Medicine and Husbandry (FMVZ), National Autonomous University of Mexico (UNAM)
Marcela Uhart	Expert	University of California One Health Institute	Argentina United States of America	University of California, Davis, United States of America
Chadia Wannous	Expert	Future Earth	Sweden Syrian Arab Republic	Towards A Safer World Network (TASW) and Future Earth Health Knowledge Action Network
Katie Woolaston	Expert	Queensland University of Technology	Australia	Queensland University of Technology, Australia
Carlos Zambrana Torrelio	Expert	Bolivia (Plurinational State of)	Bolivia (Plurinational State of)	Institute of Molecular Biology and Biotechnology, Bolivia; Bolivian Bat Conservation Program, Bolivia; EcoHealth Alliance
Paola Mosig Reidl	Liaison expert	IPBES Sustainable use of wild species assessment	Mexico	CONABIO, Mexico
Karen O'Brien	Liaison expert	IPBES Transformative change assessment scoping process	Norway	University of Oslo, Norway
Unai Pascual	Liaison expert	IPBES Values assessment	Spain	Ikerbasque (Basque Foundation for Science), Basque Centre for Climate Change, Bilbao, Spain
Peter Stoett	Liaison expert	IPBES Invasive Alien Species Assessment	Canada	University of Ontario Institute of Technology, Canada

RESOURCE PERSONS		
Name	**Role**	**Affiliation**
David Cooper	Resource person	Convention on Biological Diversity Secretariat (CBD)
Tom De Meulenaer	Resource person	Convention on International Trade in Endangered Species of Wild Fauna and Flora Secretariat (CITES)
Hans-Otto Poertner	Resource person	Intergovernmental Panel on Climate Change (IPCC)
Cristina Romanelli	Resource person	World Health Organization Secretariat (WHO)
Nichole Barger	Resource person	United Nations Convention to Combat Desertification Secretariat (UNCCD)

BUREAU and MULTIDISCIPLINARY EXPERT PANEL (MEP)			
Name	**Role**	**Nationalities**	**Affiliation**
Douglas Beard	Bureau	United States of America	U.S. Geological Survey, National Climate Change and Wildlife Science Center
Hamid Čustović	Bureau	Bosnia and Herzegovina	University of Sarajevo, Faculty of Agriculture and Food Science – Institute of Soil Science, Bosnia and Herzegovina
Luthando Dziba	MEP	South Africa	South African National Parks (SANParks)
Judith Fisher	MEP	Australia	Fisher Research Pty Ltd/Institute of Agriculture University of Western Australia, Australia
Isabel Sousa Pinto	MEP	Portugal	University of Porto, Portugal and Interdisciplinary Centre of Marine and Environmental Research (Ciimar)
Katalin Török	MEP	Hungary	Centre for Ecological Research, Hungary

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

is the intergovernmental body which assesses the state of biodiversity and ecosystem services, in response to requests from Governments, the private sector and civil society.

The mission of IPBES is to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.

IPBES has a collaborative partnership arrangement with UNEP, UNESCO, FAO and UNDP. Its secretariat is hosted by the German government and located on the UN campus, in Bonn, Germany.

Scientists from all parts of the world contribute to the work of IPBES on a voluntary basis. They are nominated by their government or an organisation, and selected by the Multidisciplinary Expert Panel (MEP) of IPBES. Peer review forms a key component of the work of IPBES to ensure that a range of views is reflected in its work, and that the work is complete to the highest scientific standards.

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United Nations Environment Programme

United Nations Educational, Scientific and Cultural Organization

Food and Agriculture Organization of the United Nations

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