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**Human Rights Council****Fifty-second session**

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Agenda item 3

**Promotion and protection of all human rights, civil,  
political, economic, social and cultural rights,  
including the right to development****Summary of the expert seminar on human rights and  
environmental conservation in the prevention of future  
pandemics****Report of the Special Rapporteur on the issue of human rights  
obligations relating to the enjoyment of a safe, clean, healthy and  
sustainable environment***Summary*

The Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R. Boyd, submits the present report in accordance with Human Rights Council resolution 46/7. Herein, the Special Rapporteur summarizes key points from the expert seminar he convened on 24 and 25 October 2022. The seminar was focused on lessons learned from the coronavirus disease (COVID-19) pandemic, challenges, good practices, and opportunities related to human rights, pandemic prevention and addressing the environmental drivers causing a surge in zoonotic diseases. The report includes recommendations for human rights-based actions to reduce the risk of future pandemics.



## I. Introduction

1. Despite the devastating consequences of the COVID-19 pandemic, humanity is sleepwalking towards future pandemics.<sup>1</sup> States are failing to address the environmental risk factors driving the surge in outbreaks of zoonotic diseases. Deforestation, agricultural expansion, the wildlife trade and intensified livestock production are increasing human-animal interactions and the ensuing risk of spillover. Climate change is affecting the geographic range of vector-borne diseases, including mosquito-borne illnesses such as malaria, Zika virus disease, dengue fever and chikungunya. These environmental risk factors have contributed to a surge in zoonotic diseases in humans over recent decades, including Ebola virus disease, HIV/AIDS, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), Marburg virus disease, Nipah virus disease and many others.

2. By failing to adequately address these risk factors, States have failed to fulfil their human rights obligations. Billions of people have been adversely affected by the COVID-19 pandemic. Conversely, fulfilling human rights, including the rights to a clean, healthy and sustainable environment, health, water, sanitation and food, will ensure healthy human populations that are resistant to disease, as well as healthy ecosystems where spillover of zoonotic diseases is less likely. Employing a strong human rights-based approach to pandemic prevention catalyses accelerated environmental action, emphasizes the importance of participation in decision-making by affected communities and ensures that the most vulnerable and marginalized populations are prioritized.

3. As they have done for decades, scientists continue to issue stark warnings about the dangers of zoonotic diseases, including coronaviruses in particular, and the urgency of taking effective preventive measures.<sup>2</sup> Although several important international initiatives have been established in response to the COVID-19 pandemic in order to strengthen prevention, preparedness, response and recovery measures, none are adequately focused on environmental conservation and human rights. Major initiatives including the Global Preparedness Monitoring Board (a joint project of the World Bank and the World Health Organization (WHO)), the Independent Panel for Pandemic Preparedness and Response, and the G20's High-level Independent Panel on Financing the Global Commons for Pandemic Preparedness and Response largely ignored the critical issue of preventing spillover.<sup>3</sup> The recommendations in the present report are intended to remedy this glaring oversight.

4. In its resolution 46/7, the Human Rights Council requested the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment to convene an expert seminar on the role of human rights and environmental conservation in the prevention of future pandemics, and to submit to the Council, at its fifty-second session, a report on the seminar. To fulfil that request, the Special Rapporteur, David R. Boyd, organized an expert seminar for a day and a half in Geneva on 24 and 25 October 2022 to discuss environmental and human rights-based approaches to pandemic prevention. The participants included representatives from States, international organizations including WHO and the United Nations Environment Programme (UNEP), civil society organizations and academia. The programme<sup>4</sup> and the concept note<sup>5</sup> are available on the website of the Special Rapporteur.

5. The seminar had three objectives: (a) examining common challenges and lessons learned, including from the failure to prevent COVID-19; (b) identifying good practices and

<sup>1</sup> P. Daszak and others, *IPBES Workshop on Biodiversity and Pandemics: Workshop Report* (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services pandemic report) (Bonn, 2020). See also [A/HRC/34/49](#) and [A/74/161](#).

<sup>2</sup> David Quammen, *Spillover: Animal Infections and the Next Human Pandemic* (New York, W.W. Norton and Company, 2012), p. 512.

<sup>3</sup> See [https://theindependentpanel.org/wp-content/uploads/2021/05/COVID-19-Make-it-the-Last-Pandemic\\_final.pdf](https://theindependentpanel.org/wp-content/uploads/2021/05/COVID-19-Make-it-the-Last-Pandemic_final.pdf).

<sup>4</sup> See <https://www.ohchr.org/sites/default/files/documents/issues/environment/srenvironment/2022-12-20/2023-prevention-of-future-pandemics-draft-programme.docx>.

<sup>5</sup> See <https://www.ohchr.org/sites/default/files/documents/issues/environment/srenvironment/2022-12-20/2023-prevention-of-future-pandemics-draft-concept-note.docx>.

ways forward in reducing the risks of spillover and zoonotic pandemics; and (c) providing recommendations for implementing a human rights-based approach to pandemic prevention.

6. While seminar participants came to the table with a diverse array of experiences, from human rights to environmental conservation to public health, they agreed that human rights and the environment must be at the centre of future pandemic prevention strategies. As will be highlighted throughout the present report, a human rights-based approach to tackling the environmental drivers of zoonotic disease outbreaks is the most effective, efficient and equitable path forward.

## II. COVID-19: a human rights catastrophe

7. The COVID-19 pandemic has exacerbated deep and structural gaps in human rights protection. The pandemic's impacts on fundamental human rights such as the rights to life, health, food, water, education and an adequate standard of living have been catastrophic. Nearly 7 million deaths have been officially ascribed to COVID-19, while excess deaths (above the number that would have been expected for the past three years) are estimated at an additional 10 million. The impacts of the pandemic have not been equally distributed; marginalized and vulnerable populations were not only at greater risk from the virus itself, but were also, and continue to be, affected the most by the measures imposed to control it.

8. COVID-19 triggered the largest global economic crisis in more than a century, pushing 115 million people into extreme poverty, reversing decades of poverty reduction efforts and exacerbating socioeconomic inequalities.<sup>6</sup> COVID-19 had disproportionate impacts on racial and ethnic minorities, whose death rates were often double those of white people or other racial groups.<sup>7</sup> Billions of people, primarily in the global South, lacked access to vaccines. There was a disturbing rise in anti-Asian violence and discrimination fuelled by racist rhetoric around the origins of COVID-19.<sup>8</sup> WHO specifically addressed this rhetoric in a bulletin, imploring people to use the official name for the disease, which was “deliberately chosen to avoid stigmatization”.<sup>9</sup> Overall, vulnerable groups bore the brunt of the negative human rights impacts of the pandemic.

9. Emergency measures employed by States to mitigate the spread of the virus had significant consequences for people's enjoyment of their human rights.<sup>10</sup> International human rights law, specifically the Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights, recognizes that limitations can be placed on human rights during serious public health emergencies.<sup>11</sup> However, those restrictions must have a legal basis, be strictly necessary, be based on scientific evidence, be limited in duration, be neither arbitrary nor discriminatory, and be proportionate to achieving the objective. While lockdowns were effective in helping control outbreaks of COVID-19, they led to widespread unemployment, disruptions in access to food and education, and greater isolation of, and violence against, vulnerable populations including women, older persons, Indigenous Peoples, racial and ethnic minorities, LGBTQ+ persons, persons with disabilities, and children.<sup>12</sup> Measures recommended to stop the spread of COVID-19, such as frequent hand-washing and physical distancing, were impossible for people without access to clean water and those living in poverty or crowded housing.<sup>13</sup> Most States were unprepared for the COVID-19 pandemic. Their inadequate responses highlighted the consequences of grossly insufficient pandemic prevention actions, lack of preparedness,

<sup>6</sup> World Bank, *World Development Report 2022: Finance for an Equitable Recovery* (Washington D.C., 2022).

<sup>7</sup> Office of the United Nations High Commissioner for Human Rights (OHCHR), “Disproportionate impact of COVID-19 on racial and ethnic minorities needs to be urgently addressed – Bachelet”, press release, 2 June 2020.

<sup>8</sup> OHCHR, “If we stay silent, the violence continues”, 25 March 2022.

<sup>9</sup> See <https://www.who.int/docs/default-source/coronaviruse/covid19-stigma-guide.pdf>.

<sup>10</sup> A/HRC/46/19, para. 2.

<sup>11</sup> See E/CN.4/1985/4.

<sup>12</sup> See A/HRC/46/19.

<sup>13</sup> United Nations, “COVID-19 and human rights: we are all in this together” (2020), p. 7.

and underlying health problems afflicting large segments of populations. Human rights obligations were rarely given sufficient consideration in emergency response plans and actions.

10. Discussions also acknowledged the devastating impacts of COVID-19 on participatory rights, including on access to information, public participation and access to justice. Poor communication and limited public participation in decision-making about pandemic responses led to poor public health outcomes. Access to information was widely curtailed, with States placing restrictions on available COVID-19 health data and silencing health-care workers, human rights defenders, and activists who criticized government responses to the pandemic.<sup>14</sup> Communication and opportunities for participation were especially impacted as the world moved online, limiting the ability of those without reliable or affordable Internet access to meaningfully engage. States also largely failed to stop the widespread dissemination of false information about the pandemic and vaccines for COVID-19.

11. Access to justice was also negatively impacted by the COVID-19 pandemic. Courts moved online to accommodate social distancing and isolation measures, limiting access to justice for some populations. In some States, courts seemed limited in their ability to protect human rights, adopting a very deferential stance towards government actions.<sup>15</sup> Some legislators used COVID-19 as cover to limit the public's ability to hold decision makers accountable through legislation and regulations. For example, in some States there were rollbacks of safeguards in environmental protection legislation, especially with respect to public participation, exclusion of some populations from environmental decision-making, and barriers to access to information.<sup>16</sup> Legislators and environmental regulators also used pandemic recovery efforts as an excuse for expediting approvals of high-risk industrial activities without adequate environmental or human rights impact assessments. These environmental rollbacks violated the fundamental human rights principle of non-regression.

12. The environmental context is particularly important because the risks of zoonotic pandemics are closely connected to environmental factors. Land-use change, agricultural expansion, livestock intensification, deforestation, climate change, biodiversity loss, and wildlife trade and consumption are increasing the risks of spillover.<sup>17</sup> States have committed to addressing many of these factors in various multilateral environmental agreements.<sup>18</sup> However, participants noted that many of the international commitments made by States had yet to be met, meaning that the global community was falling short on both environmental protection and pandemic prevention. States face varying levels of responsibility for environmental and pandemic risks, and those risks are not evenly distributed around the world. Often the groups that face the greatest threats, as well as the subsequent violations of their human rights when those threats materialize, are vulnerable and marginalized communities that are the least resilient and least well equipped in terms of education, capacity and resources.

13. COVID-19 must serve as a wake-up call to humanity to direct more attention and resources to the prevention of future pandemics. Lessons learned have revealed the inadequacy of current methods of pandemic prevention, the lack of progress towards solving the planetary environmental crisis and the failure to apply human rights-based approaches both to conservation and to pandemic prevention. Human rights-based approaches are catalysts for accelerated action to protect the environment, address climate change and conserve biodiversity, thus reducing the risk of future pandemics. Human rights also offer a range of institutions and processes through which States can be held accountable. Rights-based approaches also focus on the plight of vulnerable and marginalized populations,

<sup>14</sup> A/HRC/46/19, paras. 19–20.

<sup>15</sup> See the COVID-19 litigation database at <https://www.covid19litigation.org/case-index/database-charts>.

<sup>16</sup> United Nations Environment Programme (UNEP) and OHCHR, *COVID-19 and Impacts on Environmental Human Rights Defenders and Environmental Protection in Southeast Asia: A Regional Analysis of Legislative and Political Trends in 2020* (United Nations publication, 2021).

<sup>17</sup> P. Daszak and others, *IPBES Workshop on Biodiversity and Pandemics: Workshop Report*.

<sup>18</sup> See, for example, the Paris Agreement and the Convention on Biological Diversity.

ensuring their needs are prioritized. Zoonotic diseases are increasing in frequency, and the global community must shift from a reactive response that focuses on containing these diseases to a proactive response that prevents spillover.<sup>19</sup>

### III. The importance of preventing future pandemics

14. While the world has focused on responding to, and recovering from, the COVID-19 pandemic, less attention has been paid to pandemic prevention. Zoonotic diseases account for an estimated 70 per cent of emerging diseases, as well as almost all known pandemics.<sup>20</sup> Of the 1.7 million undiscovered viruses thought to exist in mammal and avian hosts, it has been estimated that almost half could have the ability to infect humans.<sup>21</sup> As humans continue to damage ecosystems and erode their ability to function, as our population grows and expands into wildlife habitats, and as skyrocketing numbers of animals are raised for meat and dairy production, contact between humans and animals increases and so do the risks of spillover.

15. Participants also issued warnings about the growing risks of spillback, where pathogens that have infected humans then re-infect other domestic or wild animals. As spillover risks increase, so do the risks of spillbacks. Spillback results in new zoonotic reservoirs – habitats in which the pathogens live, grow and multiply, in places where they were previously not found – heightening the risk of triggering a pandemic. This may result in new disease vectors – organisms that transmit pathogens to other living organisms – widening the range of places in which zoonotic spillover may occur.

16. Despite the widespread misconception that humans are separate from and superior to the rest of nature, the reality is that human health is intricately tied to the health of animals and the environment. Improving environmental and animal health should play a key role in preventing the emergence of pandemics. During the seminar, participants emphasized that, looking at major pandemics over human history, almost all of them had originated in wildlife, with pathogens making pitstops in domestic animals before spilling over into humans. Participants noted that once scientists had understood a particular epidemiological pathway, meaning where a zoonotic pathogen came from and the context in which it jumped from animals to humans, it became much easier to address disease emergence and prevent pandemics. Therefore, it was critical to identify those pathways.

17. Though there would always be limitations in scientific knowledge, participants stressed that there was compelling evidence about the environmental drivers of zoonoses. In this context, the precautionary principle is important, stating that where there are threats of serious or irreversible damage, a lack of full scientific certainty should not be used as an excuse to postpone action to protect the environment, safety, and public health.<sup>22</sup> For example, prior to the COVID-19 pandemic, many scientists called for urgent action to address the risks posed by coronaviruses.

18. In 2003, the world dodged a bullet in the form of the coronavirus that causes SARS. With evidence that SARS originated in Guangdong Province, the Government of China moved swiftly to close wet markets and limit commercial trade in high-risk wildlife species.<sup>23</sup> Unfortunately, these strong and effective restrictions were eventually relaxed, opening the door to COVID-19. Had State authorities acted on the warnings issued by researchers about the immense human health threats posed by coronaviruses, the COVID-19 pandemic could have been prevented or significantly mitigated.

19. Environmental risk factors must be prioritized in designing laws, policies, strategies and programmes to prevent spillover, emergence and spread. Doing so will reduce the risk of future pandemics, effectively protecting everyone – rich and poor, from north and south,

<sup>19</sup> Aaron S. Bernstein and others, “The costs and benefits of primary prevention of zoonotic pandemics”, *Science Advances*, vol. 8, No. 5 (February 2022), p. 1.

<sup>20</sup> P. Daszak and others, *IPBES Workshop on Biodiversity and Pandemics: Workshop Report*, p. 2.

<sup>21</sup> *Ibid.*

<sup>22</sup> Rio Declaration on Environment and Development, principle 15.

<sup>23</sup> See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7169858/>.

and east and west. For this reason, pandemic prevention is a more equitable approach than preparedness and response, which inevitably depend on the extent of resources that any given State is able to mobilize in response to a pandemic.

20. Participants addressed loss of biodiversity, which is directly associated with increased risks of spillover. For example, research has demonstrated that there are lower rates of West Nile virus in regions of North America with higher levels of native bird diversity and higher rates of West Nile virus in areas with lower levels of native bird diversity. Stopping deforestation and agricultural expansion maintains a natural environmental barrier that limits contact between wild animals, domestic animals and humans, thus helping to prevent pandemics.

21. There is also a need to address the risks caused by large-scale commercial wildlife trade. Caged animals that are transported over long distances suffer from depressed immune systems, filthy conditions and overcrowding, and are often in close proximity to other animal species, which results in ideal conditions for the emergence of novel pathogens. The associated risks have not been given sufficient attention in global policy discussions about pandemic prevention.

22. Agricultural expansion contributes to pandemic risk, by decreasing wildlife habitats in order to grow crops, and using land for intensive livestock operations. The vast majority of mammals and birds on earth today are domestic, not wild. Domestic animals, particularly livestock, are closely associated with the emergence and transmission of zoonotic disease. Leading examples include various strains of avian influenza and of swine flu.

23. While the livestock sector is part of the problem, participants emphasized that it could be part of the solution. Many populations depend on livestock for food and their livelihoods, so actions must simultaneously increase sustainability in the livestock sector and access to nutritious food. Participants discussed the importance of increasing biosecurity in the production of livestock. Biosecurity refers to measures taken by farmers and food producers to protect consumers from contaminated food and the transmission of diseases through food.<sup>24</sup> For example, improving affordable access to veterinarians for livestock can lower the risks of spillover.

24. Participants discussed other food system initiatives that decreased pressure on the environment. By preventing food waste and food loss, the risks of spillover caused by agricultural expansion can be reduced. Participants highlighted the work carried out by the Food and Agriculture Organization of the United Nations (FAO) with Governments to prevent food waste and food loss. The FAO Farmer Field Schools programme promotes more sustainable and more nutritious production.<sup>25</sup> Because a large portion of agricultural expansion is for livestock and fodder crops, efforts must be made to promote greater uptake of predominantly plant-based diets, especially in high-income nations where per capita meat consumption is very high. There are substantial human, ecological and animal health benefits associated with plant-based diets.<sup>26</sup>

25. Rights-based pandemic prevention that targets environmental drivers is not only the most equitable path forward, but also the most economical. Pandemics are immensely costly. The International Monetary Fund (IMF) has estimated that COVID-19 will cost the global economy \$12.5 trillion by the end of 2024, in both lives lost and economic damage.<sup>27</sup> This is a conservative estimate that does not take account of hidden costs such as psychological impacts triggered by isolation requirements (e.g. school closures). On the other hand, investing in pandemic prevention strategies and reducing spillover risks could dramatically reduce those costs. Expert estimates of the costs of pandemic prevention range from \$20

<sup>24</sup> Food and Agriculture Organization of the United Nations (FAO) and International Plant Protection Convention, "Biosecurity in food and agriculture".

<sup>25</sup> See <https://www.fao.org/farmer-field-schools/home/en/>.

<sup>26</sup> Marco Springmann and others, "Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: a global modelling analysis with country-level detail", *The Lancet Planetary Health*, vol. 2, No. 10 (October 2018).

<sup>27</sup> Reuters, "IMF sees cost of COVID pandemic rising beyond \$12.5 trillion estimate", 20 January 2022.

billion to \$30 billion annually, a tiny fraction of the expected costs of future pandemics.<sup>28</sup> IMF has stated that there is an “abundantly clear” economic case for prevention and not simply for response and recovery actions.<sup>29</sup> Participants stressed that economic analyses should be an “add-on” to human rights considerations, and not the only factor driving investment in pandemic prevention.

26. There are also huge co-benefits to be realized through investments in primary pandemic prevention. For example, reducing deforestation not only suppresses the emergence of new and known pathogens, but also prevents greenhouse gas emissions, protects the integrity of water supplies, conserves biodiversity, and if done properly, protects Indigenous rights.

#### **IV. Rights-based action to address the key drivers of zoonotic spillover**

27. Participants repeatedly emphasized concrete, rights-based actions that could be taken to address the environmental drivers of zoonotic spillover. This discussion identified the need for approaches recognizing that human health, animal health and ecosystem health were inextricably interconnected, and that each of these played a role in pandemic prevention. Participants agreed that a strong human rights-based framework, which ensured the rights to life, health, food, water, sanitation, an adequate livelihood, a clean, healthy and sustainable environment, information, public participation and access to justice, would enable effective and equitable pandemic prevention.

28. Human rights-based approaches highlight the fact that pandemic risks and burdens are unevenly distributed, and that some communities and States need greater support than others. Responding to and preventing pandemics will always be, by definition, a transboundary challenge that requires international coordination and collaboration. Pandemic prevention specifically invokes State responsibility and an examination of the transnational impacts of State actions and omissions. It is only through multilateralism and adopting human rights-based approaches to conservation and pandemic prevention that we will find an effective and equitable way forward.

29. Participants discussed the need to examine how overconsumption of resources by wealthy people in the global North inflicted detrimental consequences upon people and nature in the global South. For example, high levels of demand for beef and huge monoculture plantations for fodder crops drive agricultural expansion, livestock intensification and deforestation. These activities have profoundly negative impacts upon Indigenous Peoples, biodiversity, ecosystem health and human rights. Participants mentioned an application filed at the European Court of Human Rights by the non-governmental organization Humane Being, alleging that the United Kingdom of Great Britain and Northern Ireland was in breach of the Convention for the Protection of Human Rights and Fundamental Freedoms (European Convention on Human Rights) by failing to address the interrelated risks of the climate crisis, future pandemics, and antibiotic resistance created by factory farming. Humane Being asserted that consumer demand for meat in the United Kingdom had spawned factory farms whose fodder requirements had led to devastating deforestation in other parts of the world.<sup>30</sup>

30. Rights-based actions to make food production safer and more accessible, especially to those who struggle to secure the right to food, include increasing biosecurity, rigorously enforcing health, occupational and environmental standards applicable to the livestock

<sup>28</sup> Aaron S. Bernstein and others, “The costs and benefits of primary prevention of zoonotic pandemics”, p. 2.

<sup>29</sup> Jay Patel and Devi Sridhar, “Toward better pandemic preparedness”, *Finance and Development* (December 2021).

<sup>30</sup> Vegan FTA, “Campaigners take the world’s first legal case against factory farming to Europe’s highest court”, 29 July 2022, available at <https://veganfta.com/2022/07/29/campaigners-take-the-worlds-first-legal-case-against-factory-farming-to-europes-highest-court/>.



industry, shifting towards predominantly plant-based diets in wealthy nations, and decreasing food waste.

31. While States bear the majority of the responsibility for pandemic prevention, non-State actors, especially businesses, have a significant role to play. Participants discussed the concept of human rights and environmental due diligence and its role in safeguarding the rights of vulnerable and marginalized populations, in ensuring environmental health and in improving resilience to pandemics. Businesses are major drivers of biodiversity loss and environmental degradation, which in turn are drivers of spillover. There is an urgent need for strong, legally binding rules that force businesses to act in a responsible manner. Participants highlighted the development of a new European Union directive on human rights and environmental due diligence, which will aim to “foster sustainable and responsible corporate behaviour and to anchor human rights and environmental considerations in companies’ operations and corporate governance”.<sup>31</sup> The directive should have substantial impacts on business activities and value chains both inside and outside the European Union. If implemented effectively, it should ameliorate some of the drivers that are exacerbating environmental degradation, risks of future pandemics and human rights violations in the global South.

32. Participants cautioned that while there was a need for State legislation governing the activities and responsibilities of businesses, many steps needed for implementation also happened at the local level. This required the engagement and empowerment of many diverse communities, including Indigenous Peoples.

33. Seminar conversations included a strong call to ensure that policies and measures implemented to prevent pandemics did not themselves violate human rights standards. For example, excessively broad restrictions on wildlife trade could harm the rights to food and an adequate livelihood in communities dependent on this activity, exacerbating poverty and hunger. As noted earlier, participants were also concerned about State actions that used the COVID-19 pandemic as an excuse for retrogressive measures contrary to their human rights obligations, such as bypassing public participation in approving environmentally destructive industrial activities.

34. Suggestions were made that guidance applied by States in the context of emergencies, such as the Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights, should be strengthened to ensure that action in emergencies had a strong human rights focus that prevented government overreach. These revisions should incorporate human rights obligations and commitments related to environmental protection, climate change and pandemic prevention. There is also a need for increased transparency when States use emergencies and emergency guidance to justify their actions, in order to ensure that States respect their human rights obligations in emergencies.

35. Participants agreed that pandemic prevention actions needed to be tailored to the social, cultural, environmental and economic realities of individual communities. Imposing indiscriminate bans or other far-reaching policies may result in unintended consequences that increase, rather than decrease, pandemic risk. Understanding local contexts and tailoring policies to those contexts requires the full and active participation of local communities. This, in turn, requires that people have access to information, including science-based guidance regarding zoonotic diseases and the environmental drivers of pandemic risk. Participants noted that access to information could only occur if there was clear and transparent communication from Governments, as well as timely government responses to debunk misleading and inaccurate information.

36. It is imperative that rights-based actions to prevent pandemics specifically seek out and meaningfully engage Indigenous Peoples, in ways that respect, protect and fulfil Indigenous rights. Participants stressed the importance of legally recognizing and practically implementing Indigenous rights to land, resources and culture as important objectives in and of themselves, but also for their vital contributions to environmental conservation and

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<sup>31</sup> European Commission, “Corporate sustainability due diligence”, available at [https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence\\_en](https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en).



safeguarding the health of humans, wildlife and ecosystems. Traditional Indigenous knowledge is crucial for filling gaps in scientific knowledge regarding zoonotic disease emergence, forest management and nature-based solutions to the climate crisis.

37. The United Nations Declaration on the Rights of Indigenous Peoples recognizes and affirms that respect for Indigenous knowledge, cultures and traditional practices contributes to just and sustainable development. Participants highlighted the example of effective forest governance by Indigenous Peoples in Latin America, citing a report by FAO which illustrated that deforestation rates in Indigenous territories were up to 50 per cent lower than elsewhere.<sup>32</sup> Participants noted that Indigenous stewardship was the most cost-effective way of protecting large areas of forest, and that respecting and upholding the rights of Indigenous Peoples in pandemic prevention was a State obligation, not an option.

38. Another conversation involved the different types of wildlife trade, the exotic pet trade and trade in animals destined for scientific research, including primates, as well as the human rights-based actions that could be taken to reduce spillover risks created by those activities. Wildlife trade contributes to the intermingling of viruses and the emergence of new zoonotic pathogens. Some types of cross-border wildlife trade are now considered transnational crimes, such as trade in threatened and endangered species – a factor that should enable increased cooperation among States in addressing this particular pandemic driver. The global wildlife trade is not given enough attention in pandemic prevention. Increased surveillance and regulation of wildlife trade is needed, as well as increased enforcement of laws and policies that combat such trade.

39. Participants emphasized the need to distinguish large-scale international wildlife trade from wildlife trade based in communities whose practices were limited in geographic scale and whose immunities may have developed over time and generations. Participants stressed that wildlife trade should be monitored and enforced in ways that were respectful of human rights and community practices. Participants agreed that as mechanisms to regulate wildlife trade were developed and implemented, States must consult the communities affected, respect Indigenous Peoples' right to free, prior and informed consent, consider socioeconomic contexts and be cautious about blanket measures. In other words, there must be a balance between regulations and human rights.

40. Participants emphasized the need for greater investments in scientific research in order to assist in understanding transmission pathways and hotspots of pandemic risks, so that prevention efforts could be focused on regions with the highest risks. They also noted the lack of adequate regulatory frameworks governing laboratory research, including experiments that intentionally modified zoonotic pathogens. While participants clarified that the intent was not to constrain science, they stressed that safety must be a priority, and scientific procedures must be transparent.

41. There is growing support for implementing One Health, a public health approach designed to address complex issues that require multisectoral and interdisciplinary collaboration. One Health focuses investment in strategies that are highly effective in preventing zoonotic disease outbreaks, by promoting integrated approaches to human, environmental and animal health. Participants expressed strong support for One Health approaches, but emphasized the significant financial and human resource challenges to its implementation. However, participants also noted that those challenges presented an opportunity to build capacity, which required commitments from local governments and engagement from policymakers. The international community should provide financial resources and support for the implementation of the One Health approach in low-income States. Participants also stressed that implementation was impossible without basic investments in health care.

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<sup>32</sup> FAO and the Fund for the Development of Indigenous Peoples of Latin America and the Caribbean, "Forest governance by indigenous and tribal peoples: an opportunity for climate action in Latin American and the Caribbean" (FAO, 2021), p. 29.

42. In October 2022, FAO, UNEP, WHO and the World Organization for Animal Health released the One Health Joint Plan of Action.<sup>33</sup> This is a five-year plan for implementing One Health, with six action tracks. For each track, the plan outlines activities that aim to increase coordination, capacity-building, communication, monitoring and evaluation across sectors responsible for human, animal and environmental health. The plan’s long-term objective is to ensure that the world is better at predicting, preventing and responding to health concerns while advancing sustainable development. Under action track one, the four organizations commit to “develop frameworks, methodologies, guidelines and tools to inform their approach to One Health and strengthen the capacity of Members, Member States and States parties to implement it at regional, national and local levels”.<sup>34</sup> However, implementation ultimately lies with States.

43. Another topic of discussion was the ongoing process related to the proposed international pandemic instrument, an initiative spearheaded by WHO. The negotiations are intended to create a legally binding convention, agreement or other international instrument to strengthen pandemic prevention, preparedness and response. Participants felt that the process had been weak with regard to public participation and voiced concerns regarding the extent to which human rights would be incorporated into the treaty. Participants critiqued WHO for not engaging with human rights consistently or to the extent needed to draft an effective and equitable pandemic instrument.

44. Participants observed that pandemics were an unusual type of global health emergency. Sudden-onset disasters, triggered by a hazardous event that emerges quickly or unexpectedly – such as an earthquake, hurricane or volcanic eruption – are well understood as emergencies.<sup>35</sup> In contrast, creeping or slow-onset disasters – droughts, sea-level rise and pandemics – emerge gradually over time. By the time a creeping disaster is identified, it is often well under way, and the window of opportunity for preventive action may have closed. Participants stressed that international obligations to prevent pandemics must recognize that creeping disasters also constitute emergencies and require human rights-based preventive actions.

45. Finally, participants discussed the political aspects of pandemic prevention, a topic especially important as the world experiences pandemic fatigue. There is a need to educate politicians and policymakers about the advantages of primary pandemic prevention, a role well suited to international organizations such as WHO, UNEP, FAO and the United Nations Development Programme (UNDP). Participants noted the need for States to prioritize their human rights obligations in policies and actions related to pandemic prevention and environmental conservation, as well as the important role of civil society actors in holding States accountable. Political leadership on these issues is needed at the local, national and international levels.

## V. Good practices

46. Participants discussed specific examples of good practices in different regions in reducing pandemic risks by targeting environmental risk factors and employing human rights-based approaches. The scope of the phrase “good practice” was given a broad interpretation; it was not limited to practices that explicitly use human rights and environmental conservation in the context of preventing spillover. Participants discussed good practices that connected the dots between human, animal and ecosystem health, thus having positive, although perhaps indirect, impacts on pandemic prevention.

<sup>33</sup> FAO, UNEP, WHO and the World Organization for Animal Health, *Global Plan of Action on One Health: Towards a more comprehensive One Health approach to global health threats at the human-animal-environment interface* (One Health Joint Plan of Action) (Rome, 2022).

<sup>34</sup> *Ibid.*, p. 22.

<sup>35</sup> United Nations Office for Disaster Risk Reduction, terminology regarding disasters, available at <https://www.undrr.org/terminology/disaster>.

## A. Nipah virus

47. The Nipah virus in Malaysia provides an important example of how identifying a zoonotic pathway and adopting a One Health approach can be instrumental in preventing and eradicating zoonotic spillover. Nipah virus emerged in Malaysia in 1998 in pig farm workers and owners and was originally thought to be an outbreak of mosquito-borne Japanese encephalitis.<sup>36</sup> The State responded with surveillance and the heavy use of insecticides in an attempt to destroy mosquito populations. However, this failed to control the spread of the outbreak. Research eventually identified the Nipah virus. Bats were identified as the likely reservoir of the disease, due to Nipah's similarity to other bat-related viruses.<sup>37</sup> Pigs were identified as the intermediary hosts, which facilitated the spillover into the human populace. Many of the first infected pig farms had fruit trees growing near them, and this was identified as the spillover pathway. Bats would eat the fruit and drop saliva, urine and faeces, all contaminated with the virus, into pig pens.<sup>38</sup>

48. The initial response of Malaysia to the discovery that pigs were the intermediary host was to shut down pig farms, stop the import and export of pigs, and undertake a massive culling of almost 1 million animals.<sup>39</sup> These actions eventually stopped the outbreak. More importantly, further outbreaks have been prevented due to a regulation introduced in 1999 in Malaysia, which prohibited fruit trees from being grown near livestock operations, in order to reduce contact between domesticated animals and bats.<sup>40</sup> Malaysia successfully eradicated the Nipah virus from pig populations, due to the efficacy of an approach that considered the integration of environmental and animal health factors in zoonotic disease prevention.

## B. Implementation of the right to a clean, healthy and sustainable environment

49. In numerous States, including Brazil, Colombia, Costa Rica, Hungary, India, Indonesia, Mexico and the Philippines, Governments, local communities and civil society organizations have effectively used the right to a clean, healthy and sustainable environment to address drivers of zoonotic disease risk. For example, in Brazil, Colombia, Costa Rica, Hungary, Indonesia and the Philippines, this right has been used as a catalyst for stronger laws, policies and programmes to reduce deforestation.<sup>41</sup> In Colombia, 25 children and young people won a court case in which the Supreme Court ordered the Government to end deforestation in the Amazon rainforest.<sup>42</sup> A similar case, decided by the Supreme Court of the Philippines, contributed to the end of logging in old-growth forests.<sup>43</sup> In Mexico, members of a local community successfully asserted their right to a healthy environment in order to block a massive industrial hog facility that would have generated vast volumes of air and water pollution as well as offensive odours.<sup>44</sup> As the right to a clean, healthy and sustainable environment gains wider legal recognition across the world, it will be increasingly useful in efforts to address deforestation, agricultural expansion, livestock intensification, illegal wildlife trade and the other environmental drivers of zoonotic disease.

<sup>36</sup> Lai-Meng Looi and Kaw-Bing Chua, "Lessons from the Nipah virus outbreak in Malaysia", *Malaysian Journal of Pathology*, vol. 29, No. 2 (December 2007), p. 63. Abstract available at <https://pubmed.ncbi.nlm.nih.gov/19108397/>.

<sup>37</sup> David T. S. Hayman and others, "The application of One Health approaches to henipavirus research", *Current Topics in Microbiology and Immunology*, vol. 365 (November 2012), p. 7.

<sup>38</sup> Ibid.

<sup>39</sup> Lai-Meng Looi and Kaw-Bing Chua, "Lessons from the Nipah virus outbreak in Malaysia", p. 64.

<sup>40</sup> David T. S. Hayman and others, "The application of One Health approaches to henipavirus research", p. 8.

<sup>41</sup> David Boyd, "The environmental rights revolution: a global study of constitutions, human rights and the environment", PhD thesis, University of British Columbia, 2011.

<sup>42</sup> *Future Generations v. Ministry of Environment*, Supreme Court of Colombia, 5 April 2018.

<sup>43</sup> *Oposa et al. v. Factoran et al.*, Supreme Court of the Philippines, 1993.

<sup>44</sup> Appeal for Review, 6/2020, Supreme Court of Mexico, 19 May 2021.

### C. Education and incentives

50. Costa Rica has developed and implemented several programmes to educate individuals about environmental conservation and encourage responsible wildlife interactions. The “Stop Animal Selfies Campaign” aims to raise awareness about the negative impact of animal “selfies” and photographs that portray direct contact with wild animals.<sup>45</sup> The campaign asks tourists to be respectful of wild animals when visiting Costa Rica and provides a guide for responsible wildlife photography.<sup>46</sup> In the guide, tourists are also asked to pose with stuffed animals instead of real ones and to post those pictures with the hashtag #stopanimalselfies.<sup>47</sup> The campaign website reminds travellers that regulations in Costa Rica prohibit contact between wild animals and visitors.<sup>48</sup>

51. Another initiative established by Costa Rica and UNDP is the +Women +Nature Programme, which promotes the creation of financial instruments for women and nature and recognizes the vital role of women in environmental conservation. It includes three financial mechanisms – “Women Nature Credit”, “FONAFIFO<sup>49</sup> Credit By Your Side” and the State “Payments for Environmental Services Programme” – which are aimed at strengthening women’s economic autonomy, addressing gender gaps in nature management and realizing the Sustainable Development Goals.<sup>50</sup> The activities conducted as a result of these financial mechanisms have had multiple positive outcomes, including mitigating the socioeconomic impacts of the pandemic, advancing gender equality and protecting the environment.

52. A third good practice from Costa Rica involves a system to protect sea turtle populations, co-created by the State and local communities. Each year, Costa Rican seashores experience a multi-day phenomenon known as a mass arrival (*arribada*) of female sea turtles who lay their eggs on the beach.<sup>51</sup> Sea turtle eggs are consumed by members of coastal communities, and the *arribada* is both naturally and culturally significant. The communities are permitted to legally harvest sea turtle eggs on the first night of the *arribada*, as these eggs would likely be disturbed by turtles arriving on later days. Rules limit when and where eggs can be taken. This system allows the communities to continue their practice of consuming eggs, while protecting sea turtle populations and encouraging respectful interactions with wildlife.

### D. Promoting health care to prevent environmental destruction and spillover

53. Participants highlighted the work of the Health in Harmony organization in Indonesia as an example of a good practice. Health in Harmony is a rainforest conservation organization that aims to holistically address the health of people, ecosystems and the planet. Its mission is “to reverse tropical rainforest deforestation to halt the nature and climate crisis”.<sup>52</sup> The Health in Harmony model recognizes the link between human health and environmental health by focusing on the nexus between health care and the protection of natural resources. Health in Harmony intervened in Indonesia with a human health-centred solution to illegal logging in rural Borneo. In 2011, a moratorium on new logging was implemented to reduce carbon emissions and biodiversity loss from deforestation. However, illegal logging continued, because many communities lacked other economic opportunities to be able to afford basic health care. Health in Harmony aimed to address illegal deforestation by

<sup>45</sup> See <https://stopanimalselfies.org/>.

<sup>46</sup> The guide is available at <https://stopanimalselfies.org/wp-content/uploads/2019/10/AF-codigo-etico-es.pdf>.

<sup>47</sup> See <https://news.co.cr/costa-rica-launches-campaign-stop-animal-selfies/80591/>.

<sup>48</sup> Wildlife Conservation Law No. 7317 of 30 October 1992.

<sup>49</sup> Fondo Nacional de Financiamiento Forestal.

<sup>50</sup> Ana Lucía Orozco Rubio and Rafaella Sánchez, “+Women +Nature Programme: putting women at the heart of biodiversity finance in Costa Rica”, available at <https://www.biofin.org/news-and-media/women-nature-programme-putting-women-heart-biodiversity-finance-costa-rica>.

<sup>51</sup> Douglas Main, “This could be the biggest sea turtle swarm ever filmed”, *National Geographic*, 26 November 2019.

<sup>52</sup> See <https://healthinharmony.org/story/>.

expanding access to high-quality and affordable health care for communities living near Gunung Palung National Park, and deployed this strategy in tandem with education, conservation and alternative livelihood programmes.<sup>53</sup>

54. Results showed that deforestation declined by 70 per cent, the number of households relying on logging as a primary income source declined by 90 per cent and infant mortality declined by 67 per cent. More than 97 per cent of the households surveyed said they believed that accessible health care was responsible for reducing illegal logging.<sup>54</sup> When human populations are healthy, they are less likely to participate in environmental destruction, and they are more resilient in their ability to resist zoonotic diseases. Health in Harmony plans to expand the approach that it used in Indonesia to Brazil and Madagascar.

## E. One Health and animal health

55. Participants identified a good practice operating in Mali, through Action for Animal Health, a coalition of partners that advocates for more investment in domestic animal health to ensure resilient systems that protect people, animals and the planet.<sup>55</sup> Action for Animal Health calls on Governments and international agencies to prioritize domestic animal health systems by supporting community engagement and equitable access to animal health services, increasing the numbers and improving the skills of the animal health workforce, closing gaps in access to veterinary medicines and vaccines, improving animal disease surveillance, and enhancing collaboration for One Health. One of the initiatives of Action for Animal Health implements mobile human and animal health services in pastoral communities in Mali.<sup>56</sup>

56. The population of northern Mali is extremely dispersed. Many people rely on domestic animals and livestock trade in order to meet their basic needs, adopting a nomadic lifestyle to maintain the health of their animals through the wet and dry seasons. The livestock trade also supplies a significant amount of food to the growing urban populations in Mali. However, many human and animal health programmes have failed in northern Mali because they were not responsive to the nomadic lifestyle of the pastoralists. This has presented a challenge in managing zoonotic diseases, as people live closely together with their animals. Adopting a One Health approach, Action for Animal Health set up a mobile animal and human health centre that provides consultations, screening and care for pastoralists in northern Mali, with an emphasis on preventing zoonotic diseases. The programme has expanded to include five mobile clinics and has created dramatic positive impacts on the health of community members and their livestock. For example, 60 per cent of pregnant women now use health services, and the number of animal consultations rose from 0 in 2004 to more than 150,000 in 2021. The mobile nature of the services also means that they can respond to environmental changes such as decreased rainfall, which result in increased movement by farmers to find pasture for their herds.

## F. Stopping deforestation

57. In 2008, Norway launched its International Climate and Forest Initiative, which has been extended through to 2030, supporting global efforts to reduce deforestation of tropical forests.<sup>57</sup> Tropical forests, in addition to being significant carbon sinks, are home to millions

<sup>53</sup> See <https://healthinharmony.org/rainforests-and-communities/>.

<sup>54</sup> Isabel Jones and others, "Improving rural health care reduces illegal logging and conserves carbon in a tropical forest", *Proceedings of the National Academy of Sciences*, vol. 117, No. 45 (October 2020), p. 28517.

<sup>55</sup> See <https://actionforanimalhealth.org/about/>.

<sup>56</sup> Action for Animal Health, "Case study: implementing a mobile human health and animal health service for Mali's pastoral communities", available at <https://actionforanimalhealth.org/case-studies/case-study-one/>.

<sup>57</sup> Norwegian Agency for Development Corporation, "Norway's International Climate and Forest Initiative", available at <https://www.norad.no/en/front/thematic-areas/climate-change-and-environment/norways-international-climate-and-forest-initiative-nicfi/>.

of people and over half of the world's known plant and animal species. However, deforestation is destroying millions of hectares of tropical forests annually, contributing to increased greenhouse gas emissions, the biodiversity crisis, and increased risk of zoonotic spillover. The Norwegian initiative establishes partnerships with key States and provides substantial financial incentives and rewards to States that successfully reduce deforestation.<sup>58</sup>

58. In 2009, Norway established a partnership with Guyana with the dual objectives of maintaining the low levels of deforestation in Guyana and improving governance in the forest sector. Guyana has used the payments from Norway to fund the Amerindian Land Titling Project, which assists in securing legal ownership of land by the Amerindians – the country's Indigenous population.<sup>59</sup> To date, the support that Norway has provided to Guyana has reached approximately \$156 million.<sup>60</sup> Participants noted that this partnership set an excellent precedent, which illustrated the fact that reforestation and protection of forests could be done effectively in collaboration with Indigenous Peoples.

59. In the United States of America, the Tropical Forest Conservation Act, enacted in 1998 and reauthorized in 2019, offers eligible countries options for relieving certain official debts to the United States while generating funds in local currency to support tropical forest conservation activities. Since 1998, more than 20 Tropical Forest Conservation Act debt-for-nature agreements have been concluded, with 14 countries: Bangladesh, Belize, Botswana, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Indonesia, Jamaica, Panama, Paraguay, Peru and the Philippines. Such agreements have involved \$233 million in government funds and an additional \$22.5 million from large environmental organizations.<sup>61</sup>

## VI. Conclusions and recommendations

60. **The Special Rapporteur expresses his deep appreciation to everyone who contributed to the present report. The two-day seminar was highly informative and provided concrete recommendations for pandemic prevention actions that respect, protect and fulfil human rights while strengthening environmental conservation.**

61. **Participants agreed on five key points. First and foremost, the likelihood of future pandemics depends on interconnected factors, including the health of humans, animals and ecosystems. Second, addressing the environmental drivers of pandemic risk is critical to pandemic prevention efforts. States are not yet taking adequate actions to address these drivers, raising the spectre of more outbreaks of zoonotic diseases in the near future. Third, human rights-based approaches to pandemic prevention are the most effective, efficient and equitable approach, and are required by existing human rights obligations. Fourth, strategies to reduce spillover must be tailored to the realities of individual communities where they are implemented, which requires strong Indigenous and community participation throughout the process, from design to implementation and monitoring. Finally, reducing the risk of future pandemics in an effective and equitable way requires international cooperation, and a holistic, collaborative, multisectoral approach.**

62. **Experts suggested the following key recommendations to reduce the risk of future pandemics.**

63. **States should accelerate efforts to address and combat the major environmental drivers of zoonotic spillover by:**

(a) **Stopping deforestation and the conversion of wildlife habitat for agriculture, settlements and infrastructure;**

<sup>58</sup> Norway's International Climate and Forest Initiative, "How do we work?", available at <https://www.nicfi.no/how-do-we-work/>.

<sup>59</sup> Government of Guyana, *Guyana's Low-Carbon Development Strategy 2030* (July 2022), p. 65.

<sup>60</sup> Norway's International Climate and Forest Initiative, "Partner Countries: Guyana" (2022), available at <https://www.nicfi.no/partner-countries/guyana/>.

<sup>61</sup> FAO and UNEP, *The State of the World's Forests: Forests, Biodiversity and People* (Rome, 2020).

(b) **Tightening regulations for agriculture – including biosecurity measures to prevent transmission of infectious diseases from wildlife and livestock to people and a special focus on wildlife farming;**

(c) **Improving access to veterinary care and disease surveillance in livestock while ensuring health care and food security for pastoralists, farmers and rural communities;**

(d) **Reversing livestock intensification and publicizing the health and environmental benefits of predominantly plant-based diets, particularly in high- and upper middle-income States;**

(e) **Strictly regulating wildlife trade and live animal markets by targeting illegal, unsustainable and unhygienic practices and high-risk species while supporting sustainable trade in wildlife that fulfils the rights to food and livelihoods for poor and marginalized rural populations;**

(f) **Monitoring high-risk wildlife species and vulnerable human populations, focusing on hotspots of emerging zoonotic diseases and high-risk interfaces between wildlife, livestock and humans;**

(g) **Implementing strong regulatory approaches, which is necessary to require companies to comply with climate and environmental laws and regulations and fulfil their human rights responsibilities;**

(h) **Acting with urgency and high ambition to tackle the global climate crisis.**

64. **States should also:**

(a) **Systematically implement the One Health approach – an integrated strategy for the complex interconnections between humans, animals and ecosystems, both internationally (through collaboration among WHO, FAO, UNEP and the World Organization for Animal Health) and nationally (through cooperation among health, agriculture and environmental agencies);**

(b) **Prioritize legal recognition of the title, tenure and rights of Indigenous Peoples, Afrodescendants, peasants and local communities, empowering those who depend directly on nature for their livelihoods to engage in long-term, sustainable agricultural, harvesting and conservation practices based on traditional knowledge, customary laws and stewardship responsibilities;**

(c) **Invest in viral surveillance and research that increases the scientific understandings of zoonotic diseases in ways that minimize risks of catastrophic errors, such as the laboratory release of modified viruses;**

(d) **Ensure that all international processes currently under way addressing pandemic prevention, preparedness and response, including at WHO and the World Bank, prioritize primary pandemic prevention, human rights and environmental conservation;**

(e) **Embed, in all pandemic prevention strategies, participatory rights such as information, public participation and access to justice.**

65. **With respect to the draft international instrument on pandemic prevention, preparedness and response, States should:**

(a) **Incorporate a specific reference to the right to a clean, healthy and sustainable environment;**

(b) **Include a clear obligation on States to prioritize primary pandemic prevention;**

(c) **Clarify that wealthy States must provide finance, knowledge and technology to low-income States to assist in addressing the environmental drivers of spillover.**

66. **International organizations, including international financial institutions, should increase efforts to provide funding, resources and capacity-building to States to**



**implement the One Health approach, including full implementation of the One Health Joint Plan of Action launched by FAO, UNEP, WHO and the World Organization for Animal Health.**

**67. All actors interested in pandemic prevention, including States, subnational governments, international organizations, businesses, communities and civil society organizations, should support a holistic, rights-based approach to pandemic prevention.**

**68. States and international actors should consider establishing an inclusive, high-level task force on primary pandemic prevention, with a strong focus on human rights approaches to preventing spillover.**

**69. Civil society, including communities, individuals, and non-governmental organizations, should investigate the potential for human rights-based litigation to hold States accountable for failing to take the steps needed to prevent future pandemics. In doing so, it may be possible to draw lessons from the growing body of human rights-based climate change litigation directed at State governments from around the world.**

**70. Pandemics are catastrophic for human rights, as COVID-19 has demonstrated. Preventing future zoonotic pandemics needs to be a political priority, not an afterthought. Ignoring continued scientific warnings about the ways in which environmental factors raise the risk of spillover would be unconscionably negligent. Fortunately, human-rights based approaches to pandemic prevention are available, affordable and produce a staggering array of health, environmental, social and economic benefits. Preventing future pandemics must start now.**

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