



One Health legislation: Contributing to pandemic prevention through law

"AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE"

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INTRODUCTION

The COVID-19 pandemic and other emerging infectious diseases, as well as the continuing threat of antimicrobial resistance (AMR), are reminding us of the close connections between human, animal and environmental health and the urgent need to address them in a holistic manner. Among newly discovered or emerging infectious diseases (EIDs), 75 percent are zoonotic (i.e. transmitted from animals to humans) (Taylor, Latham and Woolhouse, 2001). The unregulated expansion of livestock farming encroaches upon pristine habitats, pushing domestic animals, humans and wildlife into closer and more frequent contact, creating the same tinderbox for disease in animals as they do in humans (FAO, 2011a). Deforestation and other land use changes have an important part in the emergence of disease (Wilcox and Ellis, 2006).

To address these increasing and inter-linked health challenges, while ensuring the biological integrity of the planet, it will be important to strengthen inter-disciplinary and cross-sectoral approaches that address not only disease prevention but also biodiversity conservation, climate change, and sustainable development overall (Wildlife Conservation Society, 2019). The Sustainable Development Goals (SDGs), in particular SDG 3 ("Ensure healthy lives and promote well-being for all at all ages") and SDG 15 ("Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss") provide a unique opportunity to break the silos and to work in a coordinated manner on human, animal and environmental health.

"One Health' is an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes" (WHO, 2017). FAO is committed to promoting One Health in the food and agriculture sectors and to the protection of the human rights to health and to a healthy environment. This involves coordination across various sectors, ranging from plant and animal health, food safety, nutrition and biodiversity, to climate change, forestry and environmental protection. It also requires embedding the principles of gender equality, economic and social responsibility into FAO normative and operational capacity development activities. To this end, FAO closely collaborates with the World Health Organization (WHO), the World Organisation for

Animal Health (OIE), the UN Environment Programme (UNEP), other UN System entities and international organizations.

Legislation is a powerful means by which countries and regional organizations translate the One Health objectives into concrete, sustainable and enforceable rights, obligations and responsibilities, paving the way for inter-sectoral collaboration. Legislation forms the backbone of appropriate frameworks aimed at preventing the introduction and spread of pests and diseases. It can contain the key regulatory controls within a sector, establish linkages among the various areas relevant for One Health and facilitate a coordinated implementation by different authorities, all of which are important to achieving the goals of One Health.

The implementation of the One Health concept requires inter-sectoral governance mechanisms at the global, regional and national levels. All relevant institutions must work closely together, each contributing their expertise, in order to formulate the most appropriate regulatory responses, minimize gaps and clarify conflicting or overlapping mandates. This is all the more so in emergency situations, such as the current COVID-19 pandemic, where emergency needs expedited decision-making, implementation and enforcement. Only with well-established coordination mechanisms, where each institution knows its role, will a government be able to react with due consideration of all the interests and areas involved.

This brief identifies some of the legal areas involved in One Health in the food and agriculture sectors. It analyses the impact of each area on One Health and how laws, regulations and institutions can contribute to the creation of appropriately designed emergency preparedness mechanisms to prevent, respond and control emerging pests, disease outbreaks and related health challenges.

SANITARY AND PHYTOSANITARY MEASURES

Sanitary and phytosanitary regulatory measures are at the core of national One Health responses. They influence the international trade in food and agriculture products and regulate the movement of pathogens associated with such trade. At the global level, agreements of the World Trade Organization (WTO), specifically the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement), provide clear rules on plant, animal health and food safety with the objective of not unnecessarily distorting trade. The SPS Agreement refers to the standards, rules and recommendations approved by three international standard-setting bodies¹: the International Plant Protection Convention (IPPC), the OIE and the Codex Alimentarius Commission. In implementation of the SPS Agreement, WTO Members that base their sanitary and phytosanitary measures on the standards of these three organizations, including incorporating such measures in their national sanitary and phytosanitary legislation, do not have to demonstrate that these measures are science-based and necessary to achieve their desired level of protection.

In the implementation of the IPPC, contracting parties are required to ensure phytosanitary security domestically and in international trade. This includes all plants and plant products, crops and wild specimens. National Plant Protection Organizations (NPPOs) must set up mechanisms to monitor and control phytosanitary health and to respond to plant pest outbreaks, especially in international trade. As a result, **plant protection legislation** has a direct role to play in preventing the international and internal movement of pathogens, thereby contributing to, inter alia, the health of the environment. Similarly, **animal health legislation**

¹ SPS Agreement, article 3.4 and Annex A.

introduces and applies the standards and recommendations of the OIE, including its Terrestrial and Aquatic Animal Health Codes. This legislation usually applies to all animals and contributes to wildlife health. Animal health legislation provides the national veterinary authority with the mandate to regulate, control and foster animal health, including the power to exercise veterinary surveillance and control, and to adopt and implement sanitary measures. It also provides the legal basis to prevent and contain the occurrence and spread of zoonosis.

In line with the SPS Agreement, animal and plant health legislation is based on the principle of risk management. Zero risk does not exist. Therefore, the objective is to minimize risk in a manner that is efficient and proportionate. On this basis, plant and animal health legislation set up similar mechanisms for **emergency preparedness, response and control**. They establish institutions to identify and address pests or diseases, including cases of suspected threat. These institutions are normally based on a “chain of command”, where the central authority would assume ultimate responsibility for ensuring coordinated action in case of outbreaks. These institutions also have the power to declare a plant or an animal emergency and to approve exceptional measures to react to the emergency, which may take the form of movement restrictions, measures to seize, treat or destroy plants and animals susceptible of transmitting a pest or a disease, and strengthened powers for inspectors. However, government powers in times of emergency should not be unlimited: the declaration of an emergency must be time-bound and periodically reviewed. In line with the SPS principles of necessity and proportionality, emergency measures must be proportionate to the risk, and not be more strict than necessary to face the emerging threat, bearing in mind that emergency measures may result in the derogation of rights and freedoms.

Food safety and quality legislation also directly contributes to One Health. It provides the basis for governments to control the safety and quality of food products and prevents the transmission of food-borne diseases, including zoonosis that can be transmitted through food. Based on Codex Alimentarius standards, food safety legislation should cover the entire value chain, “from farm to fork”, by maintaining and protecting the sanitary integrity of food as it moves through the supply chain.

Intrinsically linked to One Health objectives, and at the interface between sanitary and environmental protection, are regulatory frameworks for **sustainable food and agriculture production**. These are primarily the laws which stipulate a government’s responsibility to regulate agricultural production and inputs to prevent and mitigate potential detrimental impacts on human, animal and environmental health. The body of law, which either directly or indirectly supports or promotes sustainable food and agriculture production, is vast and varied. Fundamental components include regulatory frameworks that support the implementation of recommended food production practices, such as minimum soil disturbance, use of high-yielding adapted varieties from good seed, integrated pest management, plant nutrition based on healthy soils and efficient water management (FAO, 2011b), as well as a myriad of climate smart agriculture practices. Appropriate fisheries and aquaculture practices and adequate animal welfare standards contribute to sustainable production. **Legislation creates an enabling environment to promote and enforce such practices**. It can ensure that food and agriculture production, including the harvesting of wild products, respects human and environmental health. Good sustainable production legislation also pays attention to the rights, safety, security and living conditions of agriculture workers and the rights of vulnerable populations, including women and indigenous peoples and local communities (IPLC), which are a vital component of building sustainable food systems.

ENVIRONMENTAL PROTECTION LEGISLATION

Degradation of ecological systems has significantly increased the overall risk of zoonotic disease outbreaks, in addition to having other complex effects on human health (Evans *et al.*, 2020). Key “ingredients” that accentuate the risk of emerging infectious disease spill overs include anthropogenic activities such as changes in land and ocean use, resource extraction, pollution of freshwater resources and oceans, introduction of invasive alien species and emission of greenhouse gases (GHGs) (UNEP and FAO, 2020). In addition to having an impact on natural resources and ecosystem services, these activities have direct consequences on human health and wellbeing. In particular, pollution has been recognized as the largest environmental cause of disease and premature death in the world (Landrigan *et al.*, 2018), and links have emerged between levels of air pollution and rates of infection from COVID-19 (Zhu, *et al.* 2020). As these connections become better known, the importance of environmental law – addressing, for example, air and water pollution, waste management and wastewater discharge, climate change and the sustainable management of natural resources – is increasingly apparent (Koyuncu, 2008). Environmental law aims to address environmental conservation, as well as environmental impacts upon public health (Koyuncu, 2008).

A key regulatory mechanism to protect the environment against the detrimental effects of anthropogenic activities is the environmental impact assessment (EIA). The EIA has been defined as “a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse” (CBD, 2010). The EIA places the onus on those proposing projects, programmes and activities to identify ways to prevent and redress potential negative impacts. It can be an instrument to uphold accountability, and to support the legal defence of rights. It can also be a vehicle for the introduction of new elements, such as AMR and GHG emissions, that have an impact on human, animal, and environmental health. Thus, the EIA, which is grounded in law, is a mechanism which contributes to the prevention of ecosystem degradation and zoonotic diseases.

LEGISLATION FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

Pursuant to article 2 of the Convention on Biological Diversity (CBD), biological diversity is defined as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. The links between biodiversity and health are manifested at various spatial and temporal scales (WHO and CBD, 2015). Biodiversity delivers essential services that are the central pillars for all life, including human life, such as a clean and healthy environment, medicines and food, as well as the human *microbiota* which contribute to nutrition, help regulate immune systems and prevent infections. However, biodiversity is under threat from anthropogenic activities, which are leading to massive losses to the detriment of human and environmental health. The decline in ecosystem health, species and genetic diversity may result in an increase in pathogen transmission.

While the biodiversity and the health sectors have traditionally operated in silos, the recognition of the links between biodiversity and human health have led to the pursuit of integrated approaches that consider the connection between human, animal and plant health, including wild fauna and flora. A recent study indicates that biodiversity preservation may generally reduce the incidence of infectious diseases (Keesing *et al.*, 2020).

Mainstreaming biodiversity considerations into legislation on food and agriculture plays an important role in addressing human and environmental health. For example, legislation can incentivize agroecology and organic agriculture production systems. Plant health legislation addresses the control, surveillance of invasive alien species in wild areas, and the prevention of their propagation. By improving biodiversity protection, legislation would contribute to more resilient ecosystems and reduce the likelihood of wildlife-related pandemics.

FORESTRY, WILDLIFE AND FISHERIES LEGISLATION

Emerging infections², are infections that are rapidly increasing in incidence or geographic range, including such previously unrecognized diseases as HIV/AIDS, severe acute respiratory syndrome (SARS), Ebola hemorrhagic fever, and Nipah virus encephalitis.

“Forests and trees supply an abundance of ecosystem services that help in creating healthy living environments and in restoring degraded ecosystems. In addition to tangible products, forests for example mitigate floods, droughts and the effects of noise, purify water, bind toxic substances, maintain water quality and soil fertility, help in erosion control, protect drinking water resources, and can assist with processing wastewater” (Karjalainen, Sarjala and Raitio, 2010). Thus, forests are a major component in the complex web of interactions between human, animal and environmental health. They play a significant role in food security and livelihoods.

Ensuring health through forests requires the conservation of their ecosystems and halting the degradation of their biodiversity. “An increasing number of studies on emerging infectious diseases point to changes in land cover and land use - including forest cover change (particularly deforestation and forest fragmentation) – along with urbanization and agricultural intensification, as major contributors to the emergence of infectious diseases” (Wilcox and Ellis, 2006). Up to 60 percent of infectious diseases that have emerged in humans, including HIV, Ebola virus disease, Zika virus disease and Nipah virus infection, originated in forest-dwelling animals, and were transmitted by a range of animals, the vast majority of them wildlife. Almost one third of emerging disease outbreaks are linked to land-use change, including deforestation (Loh *et al.*, 2015), which created the conditions for diseases to jump from animals to humans (Morrison, 2016). In many respects, deforestation surpasses other global environmental issues in terms of its immediate global effects in both tropical and temperate regions (Sehgal, 2010).

Legislation pertaining to the conservation and management of forests and their resources which establish effective enforcement mechanisms, is key for the preservation of forests and trees.

Understanding the main causes of unregulated deforestation and forest degradation is central to designing forest and environmental legislation to address them. Commercial agriculture (for the production of food, feedstock, fibre and biofuel), local or subsistence agriculture, infrastructure expansion, mining and urban expansion, are all direct drivers of deforestation. These are in turn driven by several underlying factors, such as national interests, economic development, population growth and lack of capacity and resources to enforce legislation and manage forest resources in a sustainable manner (FAO, 2020). A cross-sectoral multidisciplinary approach should be followed when developing and/or assessing policies and legislation that impact forests, be it directly or indirectly, which would contribute to improve coherence and harmonization. They should support the sustainable exploitation of these resources and address

² As defined in Relman, David, Hamburg, Margaret A., et al.; 2009

their impact on forests and the global environment as a whole, notably global warming. Restoration of ecosystems damaged by these activities is likewise crucial.

The **role of wildlife and fisheries legislation in the One Health approach is clear**. Overlooking or under-regulating certain aspects of the wildlife or fisheries value chains, whether for consumptive or non-consumptive purposes, may result in health risks for humans and animals. On the other hand, excessively stringent regulations, indiscriminate prohibitions and the suspension of rights during emergencies are likely to negatively impact on the food security of IPLCs, who will be even more dependent on these resources for their subsistence during emergencies.

Wildlife and fisheries legislation should reflect and give effect to a wide range of relevant cross-sectoral policies. This includes environmental sustainability (including biodiversity and ecosystem preservation), socio-economic development, gender equity, and animal health and food safety. In addition to these, legislation should consider customary use and traditional knowledge, vulnerable and indigenous peoples' rights, and human-wildlife conflicts (FAO, 2010). Traditionally, wildlife and capture fisheries legislation regulate the hunting and fishing sectors through the establishment of licensing systems, the determination of hunting/fishing species, total allowable catch, quotas, seasons and methods. In recent years, legislation in these areas has witnessed innovative and dynamic trends by addressing the non-consumptive uses and conservation of these resources, thereby promoting a more diversified range of options to achieve the sustainable management of wildlife. A participatory and inclusive approach towards wildlife and fisheries management should be promoted in contemporary tenure and management frameworks, supported through relevant legislation (FAO, 2012b). Effectively addressing human-wildlife conflicts, including zoonotic diseases and illegal wildlife trade, would alleviate the position of some of the less advantaged people in rural communities who live close to wildlife and rely on it for subsistence and cultural identity. However, this ubiquitous phenomenon is poorly addressed in both international and domestic laws and this grave omission has led to disastrous effects on humanity, as COVID-19 has shown.

AMR LEGISLATION

Antimicrobial resistance (AMR) has been described as the “quintessential One Health issue” (Robinson et al., 2016) as it has **clear links to human, animal and environment health**. AMR refers to microorganisms – bacteria, fungi, viruses, and parasites – that have acquired resistance to antimicrobial (AM) substances (FAO, 2016). While the phenomenon of AMR occurs naturally through microbial adaptation to the surrounding environment, it has been exacerbated by inappropriate use of AMs, especially in the human health and agriculture sectors. AMR is receiving renewed attention, as the current COVID-19 crisis reminds the world how destructive public health emergencies can be. **Though AMR's effects are unlikely to be as acute as COVID-19's, over the long term it is predicted to cause far more deaths**. A slow-moving pandemic, it causes about 700,000 deaths yearly, including over 200,000 people who die from tuberculosis that is resistant to at least one drug. It has been projected that multi-resistant bacterial infections will be the main cause of death by 2050, surpassing 10 million fatalities annually around the globe. Secondary bacterial infections have been noted as one of the causes of death for COVID-19 patients (Zhou *et al.*, 2020).

Legislation is essential in addressing the abuse, overuse, misuse and release into the environment of AMs and resistant bacteria to minimize the development and spread of AMR.

Regulatory mechanisms to control and reduce AMR are found in a variety of different legal instruments at the national level. As is the case for other aspects of the One Health approach, legislation relevant for AMR is not typically developed to directly address AMR and might not include specific references to AMR. Nonetheless, legislative frameworks for human and animal health, veterinary medicinal products, pesticides management, environmental protection, food safety, water or waste management normally include the regulatory powers and mechanisms (prohibitions, licenses, permits) necessary to effectively address AMR.

CONCLUSION

It is increasingly recognized that human, plant and animal health, environmental health and food security are inter-linked and that the degradation of ecological systems has significantly increased the overall risk of zoonotic disease outbreaks, in addition to having other complex effects on human health. The devastating human, social and economic effects of COVID-19 should force the global community to ensure prevention of another similar event.

The One Health approach provides a platform to work on the interface between human, animal and plant health and their shared environment. Working on the synergies among these areas is key to preventing the outbreak, or mitigating the impact of new diseases, and improving the immunological response of all organisms to existing and new biological threats. Under a One health approach, economic development and agriculture production pay attention to the impact of anthropogenic activities on the environment, animal health and welfare. Attention is also paid to wild animals and fauna, the protection of forests and biodiversity and mitigation of climate change. A well preserved environment, together with healthy animals, plants and ecosystems are more resilient and better prepared to react against new pathogens or mitigate their impact.

Recognising the fundamental importance of a stable and co-managed natural environment for human, animal and environmental health highlights the need to adopt a One Health approach, not only to ensure a rapid response to mitigate the immediate effects and impact of the COVID-19 pandemic, but to reduce the possibility of future prevalence and outbreaks.

Legislation can pave the way to a solid and sustainable implementation of the One Health approach, providing the regulatory basis to strengthen animal and plant health in agriculture and wildlife, as well as to ensure food safety. It also contributes to safeguarding and restoring ecosystems by introducing mechanisms to prevent and control environmental contamination, the degradation of forests, and climate change. It provides regulatory tools to preserve biodiversity in all areas of food and agriculture, including wildlife and fisheries. The implementation of a One Health approach would benefit from regulatory instruments that clarify the roles and responsibilities of the various actors involved in One Health, including procedures for participatory and coordinated decision-making and accountability. In doing so, legislation can address and re-establish the rights of local communities, and more broadly the realization of the right to health and a healthy environment of the population.

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