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# FAO REGIONAL CONFERENCE FOR ASIA AND THE PACIFIC

## Thirty-sixth Session

**Dhaka, Bangladesh, 8-11 March 2022**

### Identifying One Health priorities in Asia and the Pacific region

#### Executive Summary

Human, animal, plant and environmental health are intimately connected through the ecological realities governing life. Our health depends on the health of the environment, which provides us, at a minimum, with the food we eat, the air we breathe and the water we drink. With rapid population growth, as well as globalization and environmental degradation, health threats have become more complex. Solutions cannot be found by one sector alone. The problems affecting human health, terrestrial and aquatic animals, plants, and the environment can be effectively resolved only through improved coordination, communication and collaborative actions across disciplines and sectors, and that these are sustainable solutions. This has come to be called the One Health approach.

It is well established that animal diseases can have significant impacts on livestock production, trade, livelihoods, food security and national economies as well as on human health if spillover takes place. Furthermore, animal diseases can severely affect endangered or threatened wildlife populations and biodiversity conservation efforts. Preventing disease emergence and spread and meeting the global demand for food while ensuring the health and function of agro-ecological systems and ecosystems is a major part of this broader challenge and at the centre of the Food and Agriculture Organization of the United Nations' (FAO) mandate. Achieving success will require One Health cross-sectoral and transdisciplinary collaborations at regional, national, and subnational levels.

To date, One Health has primarily engaged the public health sector and veterinary services and largely focused on addressing zoonotic diseases, Antimicrobial Resistance, food safety, and an occasional focus on emerging infectious diseases. One Health has yet to properly engage the Ministries responsible for wildlife, biodiversity, ecosystems, natural resource management and the environment. One Health programming has yet to be applied to protecting or restoring biodiversity and ecosystems from anthropogenic drivers of degradation known to contribute to the emergence of zoonotic pathogens, and transmission of diseases among wildlife and livestock. It is these upstream interventions that are also needed to prevent spillover events and mitigate health threats.

This paper provides an overview on One Health, technical areas where One Health is being applied, and current gaps in One Health programming. FAO has long-standing experience in supporting Ministries of Agriculture and Livestock and national veterinary services in the region. However, we

*This and other documents can be consulted at [www.fao.org](http://www.fao.org)*

seek guidance from the FAO Regional Conference for Asia and the Pacific (APRC) on capacity development and training needs, and priority areas that FAO should consider addressing through the expanded regional One Health Initiative, and as part of the One Health FAO corporate Programme Priority Areas.

Suggested interventions from APRC Members across the region will contribute to greater global health security, the prudent and responsible use of antimicrobials, sustainable production of safe and nutritious food, and better natural resource management to safeguard biodiversity, ecosystems and, ultimately, human health and well-being.

### **Suggested action by the Regional Conference**

The APRC is invited to take note of the importance of One Health as an approach for addressing complex multisectoral issues that are relevant to health, the environment and food/nutrition security; and to recognize the importance of One Health as a global initiative that has resulted in the recent establishment of a One Health High-Level Expert Panel.

The APRC is invited to recognize and acknowledge the importance of One Health in Asia and the Pacific region and at national level to prepare for, prevent, respond to and control health threats at the human-animal-environment interface; to protect and restore biodiversity; and to prevent degradation of natural resources and the wider environment to promote the health of animals, people and ecosystems underpinning sustainable development.

The APRC is invited to provide guidance and endorsement on priorities for technical assistance to enhance and expand One Health beyond the domains of zoonotic disease prevention and control, Antimicrobial Resistance (AMR), and food safety. In particular, the APRC is invited to:

- a. recognize FAO's strategic role in facilitating One Health policy interventions that reflect priorities of the Ministries of environment (forestry, wildlife, and natural resource management), agriculture, and health, and advise on modalities to support this role;
- b. recognize the importance of FAO's work to lead efforts to engage the Ministries of environment and relevant partners, given the priority technical initiatives such as the Decade on Ecosystem Restoration, biodiversity mainstreaming, green and climate resilient agriculture, and linkages to priorities of the Asia Pacific Forestry Commission and Animal Health and Production Commission;
- c. endorse FAO's work to undertake a One Health environment sector needs assessment for countries in Asia and the Pacific region to identify individual and institutional country capacity needs in the areas of biodiversity, ecosystems, wildlife, and One Health;
- d. recognize the importance of FAO-led One Health training and enhanced support focused on:
  - i. enabling Ministries of Environment to engage in One Health policy development and programmes with health and veterinary counterparts at regional, national and subnational levels;
  - ii. protecting the environment from anthropogenic drivers of degradation;
  - iii. improving upstream interventions to prevent spillover and food-borne emergence of infectious zoonotic pathogens, antimicrobial-resistant pathogens, and spread of transboundary animal diseases; and
  - iv. enabling Ministries of Health and agriculture/veterinary services to appreciate and understand the importance of the environment and linkages to health.
- e. take note of FAO's role in expediting the establishment of national One Health multisectoral coordination mechanisms, developing national One Health action plans, and/or One Health programmes inclusive of the environment, veterinary and public health sectors;

- f. confirm the need for FAO to increase advocacy and awareness campaigns to improve country and regional support for One Health policy, programmes, multisectoral coordination and collaboration; and
- g. recommend that One Health priorities be included in FAO technical cooperation assistance to accelerate the engagement of relevant ministries on One Health implementation at national, subnational, and regional levels.

*Queries on the content of this document may be addressed to:*

APRC Secretariat

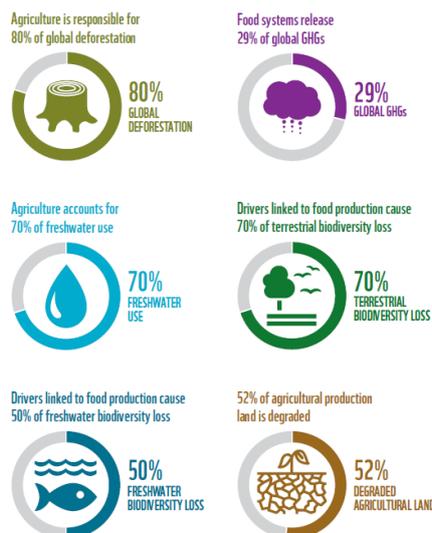
APRC@fao.org

## Introduction

1. One of the greatest challenges we face in Asia and the Pacific region is balancing the needs of people, domestic animals, wildlife, biodiversity, and ecosystems in the face of limited natural resources and increasing global population and consumption. More than 4.5 billion people live in Asia (2021), representing approximately 60 percent of the world's current population. Furthermore, a large portion of the human population is directly dependent on terrestrial and aquatic natural resources for livelihoods, and many of the most vulnerable people depend directly on biodiversity to fulfil their needs for food and nutrition security and for shelter.

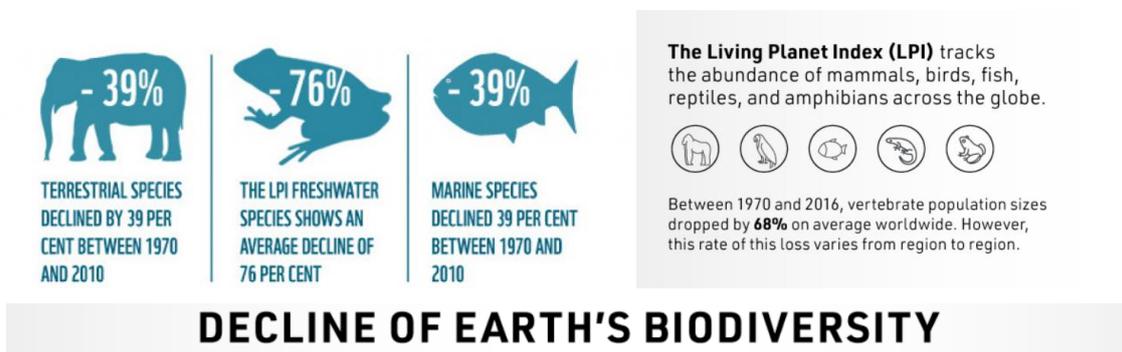
2. Population dynamics largely influence agriculture and food production. Meeting the regional and global demand for food while ensuring the health and function of agro-ecological systems is a major challenge (see Figure 1). Expanding and intensifying livestock, aquaculture, and crop production often leads to detrimental outcomes, including: habitat conversion to agriculture resulting in encroachment and loss of forests, wetlands, grasslands, biodiversity, and ecosystem services; reduction of freshwater available in rivers, streams, lakes, wetlands, and ground-water supplies; increased use of antimicrobials and pesticides, and environmental contamination; and increased runoff, erosion, and pathogen redistribution. At this moment, human demands on the planet are outstripping its ability to provide goods and services.

3. Finally, food processing, trade, and distribution (food chains) are global in nature, often creating a large carbon footprint and associated pollution driven by the high-income market economies' demand for foods produced all over the world all year around. This carbon footprint is largely driven by consumer preferences rather than nutritional needs and requirements and makes the transformation of our global food systems (production, distribution, and consumption) more important than ever. The essential One Health transformation aligns with one of the aims of the UN Food Systems Summit 2021 and has been identified as a key priority of *Building Back Better* after the COVID-19 pandemic.



**Figure 1. Environmental impacts of food production.** Adapted from the Convention on Biological Diversity (2014)<sup>1</sup>, Global Sustainable Development Report (2019)<sup>2</sup> and Economics of Land Degradation Initiative (2015)<sup>3</sup>.

4. Since 1970, the Earth has lost more than half its wildlife. Biodiversity (plants and animals) is being lost at an alarming rate in terrestrial, fresh-water and marine ecosystems. Between 1970 and 2012, the percentage of species (mammals, birds, fish, reptiles, and amphibians) that have undergone population declines in these systems was -39 percent (terrestrial), -76 percent (fresh water), and -39 percent (marine). In Asia and the Pacific, between 1970 and 2016, the abundance of vertebrate biodiversity declined by 45 percent (see Figure 2).<sup>4</sup>



**Figure 2. Decline in biodiversity in Asia.** Adapted from World Wildlife Fund Living Planet Report (2020).<sup>5</sup>

5. Human, animal, and environmental health are inextricably connected through the ecological realities governing life. An ecosystem is the biological community of interacting organisms (including humans) and their physical environment. Ecosystems provide people with many benefits we often take for granted, including fresh air, clean water, crop and fruit pollination, and food and natural medicine production. Ecosystem services also provide outdoor recreational, spiritual, and religious opportunities and enable nutrient recycling and soil formation. We rely on nature to safeguard our physical, mental,

<sup>1</sup> Secretariat of the Convention on Biological Diversity. 2014. Global Biodiversity Outlook 4. (also available at <https://www.cbd.int/gbo/gbo4/publication/gbo4-en-hr.pdf>).

<sup>2</sup> Global Sustainable Development Report. 2019. The future is now: Science for achieving sustainable development. (also available at [https://sustainabledevelopment.un.org/content/documents/24797GSDR\\_report\\_2019.pdf](https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf)).

<sup>3</sup> Economics of Land Degradation Initiative. 2015. Report for policy and decision makers: Reaping economic and environmental benefits for sustainable land management. (also available at [https://www.eld-initiative.org/fileadmin/pdf/ELD-pm-report\\_05\\_web\\_300dpi.pdf](https://www.eld-initiative.org/fileadmin/pdf/ELD-pm-report_05_web_300dpi.pdf)).

<sup>4</sup> World Wildlife Fund. 2014. Living Planet Report. (also available at <http://www.pri.org/stories/2014-10-01/global-wildlife-populations-have-fallen-half-stat-says-it-all>).

<sup>5</sup> World Wildlife Fund. 2020. Living Planet Report 2020: Bending the curve of biodiversity loss. (also available at <https://f.hubspotusercontent20.net/hubfs/4783129/LPR/PDFs/ENGLISH-FULL.pdf>).

and emotional health and well-being. When ecosystems are degraded or destroyed, we compromise our health and that of the organisms in the ecosystem.

6. Recent literature shows that with biodiversity loss in disturbed, fragmented, or human-dominated landscapes, certain species proliferate, and these species are more likely to be zoonotic disease hosts, increasing the risk of spillover into people. In natural or less-disturbed habitats, there is a greater biodiverse group of species present and such zoonotic reservoir hosts are less abundant compared to other species, making zoonotic disease transmission less likely.<sup>6</sup>

## **Implementing One Health in the Asia and Pacific Region – Current Status and FAO's Contribution**

### *The Disease Burden*

7. South-East, Southern and Eastern Asia regions are known as global hotspots for the emergence of zoonotic infectious diseases<sup>7</sup> due to a combination of high human population density, high livestock density and production systems, wildlife abundance, high levels of land-use change, deforestation, and habitat fragmentation. These dynamics lead to high contact rates among humans, wildlife and livestock and the risk for diseases to spill over from one sector into another.

8. Major anthropogenic drivers of zoonotic disease emergence have been largely grouped into three categories.<sup>8 9 10</sup>

- a. **Modifications to natural habitats.** These include climate and land-use changes, development (urban or agricultural), dams, extractive industries, loss of biodiversity, ecosystem services, natural resources and habitat, encroachment on natural habitats, and environmental contamination;
- b. **Changes in agricultural practices.** These include agricultural intensification and expansion of crop, livestock and aquaculture farming, changes in food value chains (global or across country/regional borders), waste management (of water, feces, antimicrobials, runoffs), unregulated use of antibiotics, globalized value chains, and marketing;
- c. **Human behaviour and choices.** These include increased utilization/exploitation of wildlife for exclusive food consumption in urban centres (wildlife, bushmeat), traditional medicines using animal body parts or organs, and exotic pet ownership.

9. Over 60 percent of human infectious diseases have emerged from animals. Of those, most have come from wildlife<sup>11</sup> and either spilled over into people directly or were transmitted to people via livestock as an intermediate host.<sup>12</sup> About 70 percent of emerging infectious diseases and almost all known pandemics are zoonoses – an infectious disease that can be transmitted between animals and humans. These microbes spill over due to increased contact between wildlife, livestock animals and people. Of the estimated 1.7 million currently undiscovered viruses that exist in mammal and avian

<sup>6</sup> Keesing, F. & Ostfeld, R. S. 2021. Impacts of biodiversity and biodiversity loss on zoonotic diseases; Proceedings of the National Academy of Sciences Apr 2021, 118 (17) e2023540118. (also available at doi:10.1073/pnas.2023540118)

<sup>7</sup> Lipkin, W.I. 2013. The changing face of pathogen discovery and surveillance. *Nature Reviews Microbiology*, 11(2):133-141. (also available at doi: 10.1038/nrmicro2949).

<sup>8</sup> Chomel, B.B., Belotto A., & Meslin F.X. 2007. Wildlife, exotic pets, and emerging zoonoses. *Emerging Infectious Diseases*, 13(1):6-11. (also available at doi:10.3201/eid1301.060480).

<sup>9</sup> Perry, B., Grace, D. & Sones, K.R. 2013. Current drivers and future directions of global livestock disease dynamics. *Proceedings of the National Academy of Sciences of the United States of America*, Dec 24;110(52):20871-20877. (also available at doi: 10.1073/pnas.1012953108).

<sup>10</sup> Hassell, J.M, Begon, M., Ward, M.J, & Fèvre, E.M. 2017. Urbanization and Disease Emergence: Dynamics at the Wildlife-Livestock-Human Interface. *Trends in Ecology & Evolution*, 32(1):55-67; doi: 10.1016/j.tree.2016.09.012.

<sup>11</sup> Keusch, G.T., Papaioanou, M., Gonzalez, M.C. Scott, K.A. & Tsai P. 2009. Sustaining Global Surveillance and Response to Emerging Zoonotic Diseases. New York: National Academic Press.

<sup>12</sup> Jones, K., Patel, N., Levy, M., Storegard, A., Balk, D., Gittleman, J.L., & Daszak, P. 2008. Global trends in emerging infectious diseases. *Nature*, 451, 990–993. (also available at doi:10.1038/nature06536).

hosts, between 631 000 and 827 000 could have the ability to infect humans.<sup>13</sup> The most important reservoirs of pathogens with pandemic potential are mammals (e.g. bats, rodents, primates) and some water birds, as well as livestock (e.g. swine, camels, poultry). Spillover into humans takes place either when a person is bitten by an infected insect (one that has previously bitten an infected animal), ingests or handle food or water contaminated with feces, or when a person comes into direct, close contact with an infected animal.

10. Increased human-wildlife contact is taking place in wildlife farming production and marketing systems in Asia and the Pacific region, with the trafficking of wildlife across borders for food and medicinal purposes, or to support the exotic pet trade industry. Additional contact occurs when extractive industries such as timber and mining start up in remote natural locations and workers depend on wild meat for food. Finally, human-wildlife contact takes place among indigenous peoples and subsistence communities that are dependent on wild meat for food and nutrition security. Noteworthy is that in most of these remote settings, contacts take place where people and communities lack strong infrastructures and medical, veterinary and animal production services, as well as food safety control systems.

11. Increased livestock-wildlife contact is also relevant to zoonotic disease transmission because some diseases are transmitted from wildlife to livestock and then to people. Increased livestock-wildlife contact is taking place when new farms encroach on wildlife habitats, when pastoralists graze animals on rangelands or forested areas used by wildlife, in locations where animals (wild and domestic) share limited water resources, and on farms that raise both livestock and wildlife or at markets that sell them.

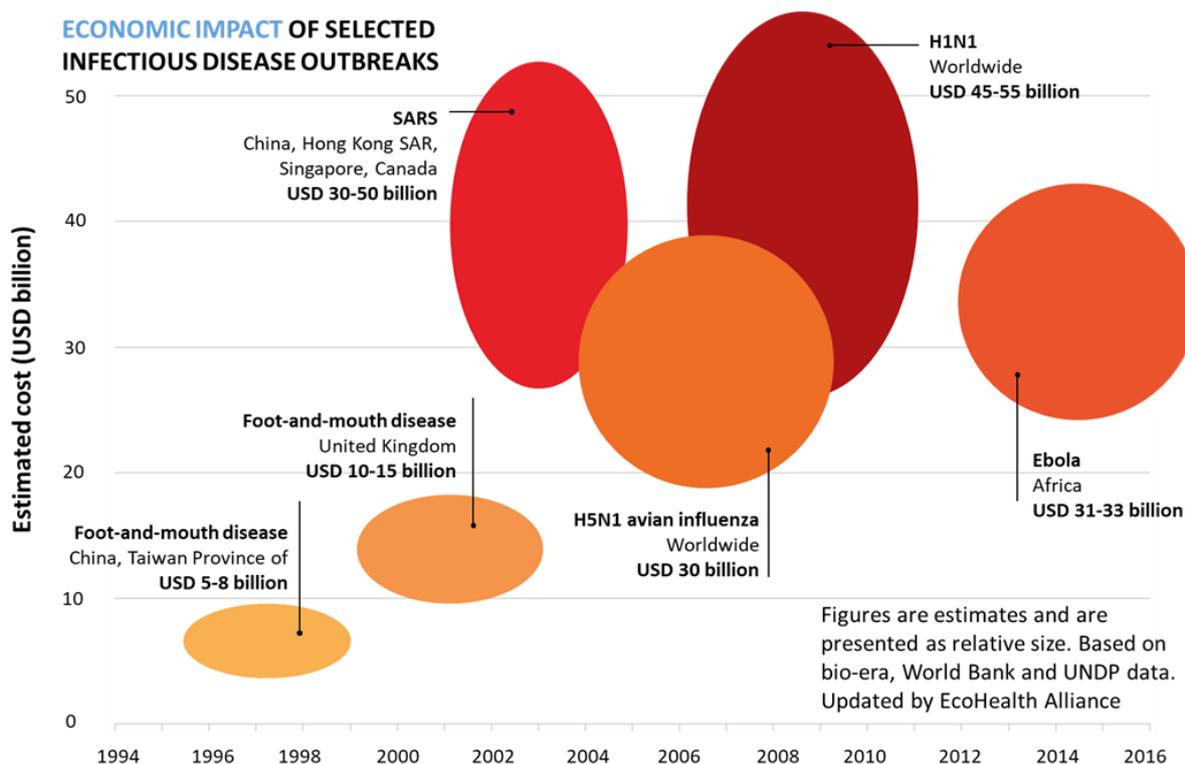
12. Women and men have different roles in managing livestock, treating animals and handling animal products, and women are often responsible for household food safety and hygiene. Three-quarters of the rural poor depend on and interact closely with livestock on a daily basis while caring for, milking, or treating animals, or in many cases, through sharing unhygienic and unsanitary living spaces with animals. These dynamics characterize the risks associated with human-livestock contact. Socio-economic, political, cultural and other inequalities also contribute to limited awareness on risky behaviours, safe farming practices and food safety precautions that could limit the risks of disease spillover events. Additional human-livestock contact is driven by expansion and intensification of livestock production systems, which include animal care, animal slaughtering, meat processing and sale of live animals at markets. Integrating gender aspects into interventions, including gender awareness campaigns, is necessary to mitigate potential risks associated with human-livestock contact.

13. In 2010, the World Bank estimates that zoonoses cost an estimated USD 20 billion in direct costs and over USD 200 billion in indirect losses in the last ten years.<sup>14</sup> Asia and the Pacific region continues to suffer major economic impacts from disease outbreaks in livestock, wildlife, and people (see Figure 3), although there is less documentation of disease impact on crops and aquaculture. As this region continues to undergo large-scale and rapid changes in its landscape, trade, consumption and demographics, these events are expected to continue. While the economic impact of the COVID-19 pandemic is still being tallied, it is clear that this pandemic dwarfs the financial impact of other disease events in the region, or globally for that matter. Disease prevention, rapid response and control are essential measures for supporting livelihoods, food and nutrition security, economic prosperity and global health security. Until the drivers of disease emergence are addressed, we will continue to pay the price.

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<sup>13</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. 2020. Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services. Daszak, P., das Neves, C., Amuasi, J., Hayman, D., Kuiken, T., Roche, B., Zambrana-Torrel, C., Buss, P., Dunderova, H., Feferholtz, Y., Foldvari, G., Igbino, E., Junglen, S., Liu, Q., Suzan, G., Uhart, M., Wannous, C., Woolaston, K., Mosig Reidl, P., O'Brien, K., Pascual, U., Stoett, P., Li, H. & Ngo, H. T. IPBES secretariat, Bonn, Germany. (also available at doi:10.5281/zenodo.4147317).

<sup>14</sup> World Bank. 2010. *People, Pathogens and Our Planet, Volume 1: Towards a One Health Approach for Controlling Zoonotic Diseases*. Washington, DC: World Bank, Agriculture and Rural Development Health, Nutrition and Population. (also available at <https://openknowledge.worldbank.org/handle/10986/2844>).



**Figure 3. The rising global costs of animal disease and human health epidemics 1995-2016.** Adapted from EcoHealth Alliance<sup>15</sup> and Bio Economic Research Associates.<sup>16</sup>

14. Emerging or endemic infectious diseases spreading among livestock, aquaculture and wildlife have caused significant costs to the livestock and aquaculture sectors. In aquaculture, disease transmission from wild relatives to captive stock commonly occurs through the shared water they inhabit. Equally, the incubation of viral disease in cultured stock can escape to wild relatives who then act as a reservoir, reinfesting subsequent crops of farmed stock. This is perhaps best illustrated by the waves of successive viral disease of cultured shrimp that has affected the Asian region in the past 40 years and caused billions of dollars in economic losses. The costs of sea lice control in the farmed salmon industry are another example. The additional costs of disease impacts on wild stocks for capture fisheries for shrimp has never been evaluated but is noted to be significant.

15. Economic losses from decreased shrimp production due to acute hepatopancreatic necrosis disease (AHPND) at Mahachai Market, one of Thailand's principal seafood markets, from 2010 to 2017 is estimated at USD 7.38 billion, with a further USD 4.2 billion in export losses. Shrimp disease-related losses due to AHPND and white-spot syndrome virus in the Vietnamese Mekong Delta were estimated in 2015 to be more than USD 37 million.<sup>17</sup>

16. With over 60 percent of the world's domestic pig population in Asia and the Pacific region, the potential impacts of African Swine Fever on the swine industry/pig farming were enormous, as it was first reported from China in 2018. With no vaccine or effective treatment for this transboundary animal disease, control is through enhanced biosecurity; to date, over 200 million pigs have either died or been culled in the region, significantly affecting livelihoods and food security in the region. In addition, African Swine Fever has become a threat to populations of 11 native boar species in the

<sup>15</sup> EcoHealth Alliance. 2019. Cost of outbreaks. (also available at <https://www.ecohealthalliance.org/2019/07/targeting-outbreaks-at-their-source/cost-of-outbreaks>).

<sup>16</sup> Bio Economic Research Associates. 2004. One World-One Health: An economic perspective. (also available at <http://www.oneworldonehealth.org/nov2004/pdfs/newcomb.pdf>).

<sup>17</sup> Shinn, A.P., Pratoomyot, J., Griffiths, D., Trong, T.Q., Vu, N.T., Jiravanichpaisal, P., & Briggs, M. 2018. Asian shrimp production and the economic costs of disease. *Asian Fisheries Science*. 31S:29-58; (also available doi:10.33997/j.afs.2018.31.S1.003<http://www.asianfisheriessociety.org/publication/downloadfile.php?id=1223&file=Y0dSbUx6QTJOekUyTURVd0lERTFORGMzTWpVek5EZ3VjRlJt>).

region, and the disease could push species towards extinction. This is the example of how a single transboundary animal disease can have such significant impact, and yet we are challenged to manage many others including Foot and Mouth Disease, Lumpy Skin Disease, Peste Petite Ruminant, Highly Pathogenic Avian Influenza (HPAI), among others.

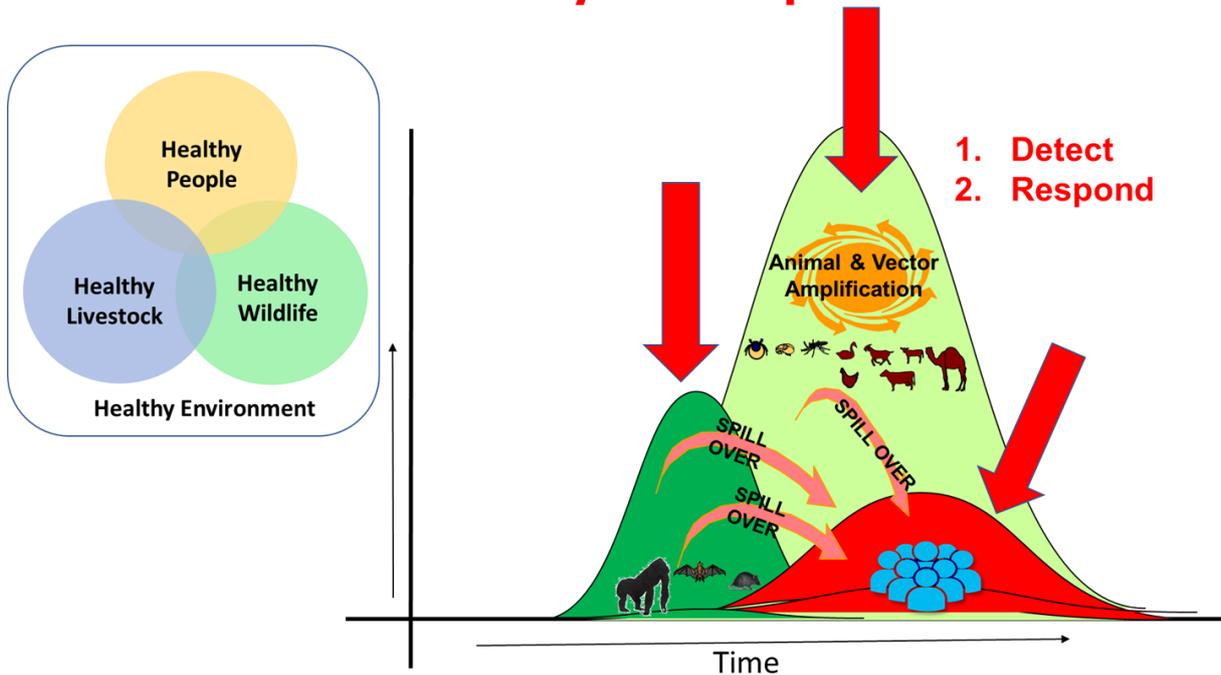
### ***The Focus of One Health***

17. It is clear that no single sector can succeed alone in addressing these complex and interwoven issues. As defined by the veterinary and medical community, One Health is a collaborative effort of multiple disciplines working together locally, nationally, regionally, and globally to promote and ensure the health of people, livestock, wildlife, and the environment. Placed into a more ecological context, One Health promotes and ensures the health of people, biodiversity, and ecosystems, and needs to address the root causes of biodiversity loss and ecosystem degradation.

18. Most One Health collaboration has taken place between the public and veterinary health sectors, largely focused on surveillance for pathogens (detection) and reacting to an outbreak (response) once animals or people become sick. In recent years, surveillance in wildlife populations has focused on finding pathogens that may spill over into livestock or people before this happens. For One Health to properly address prevention, engagement of the Ministries of forestry, wildlife and natural resource management is essential, and additional upstream interventions (see Figure 4) are needed to:

- a. protect biodiversity and functional ecosystems;
- b. prevent contact among people, wildlife and livestock and spillover events to the greatest extent possible through improved land-use planning and management, preventing encroachment, and addressing human-wildlife conflict;
- c. implement sustainable, climate-smart, agro-ecological agricultural development;
- d. improve waste (water, feces, antimicrobials, runoff) management at farms and industrial sites;
- e. promote safe farming practices and improved biosecurity; and
- f. mitigate risk of spillover along livestock and wildlife food chains, from forest or farm to fork.

### For medically trained personnel



### For those trained in natural resource management - biologists & ecologists

PROTECT Natural Resources, PREVENT contact & spill-over

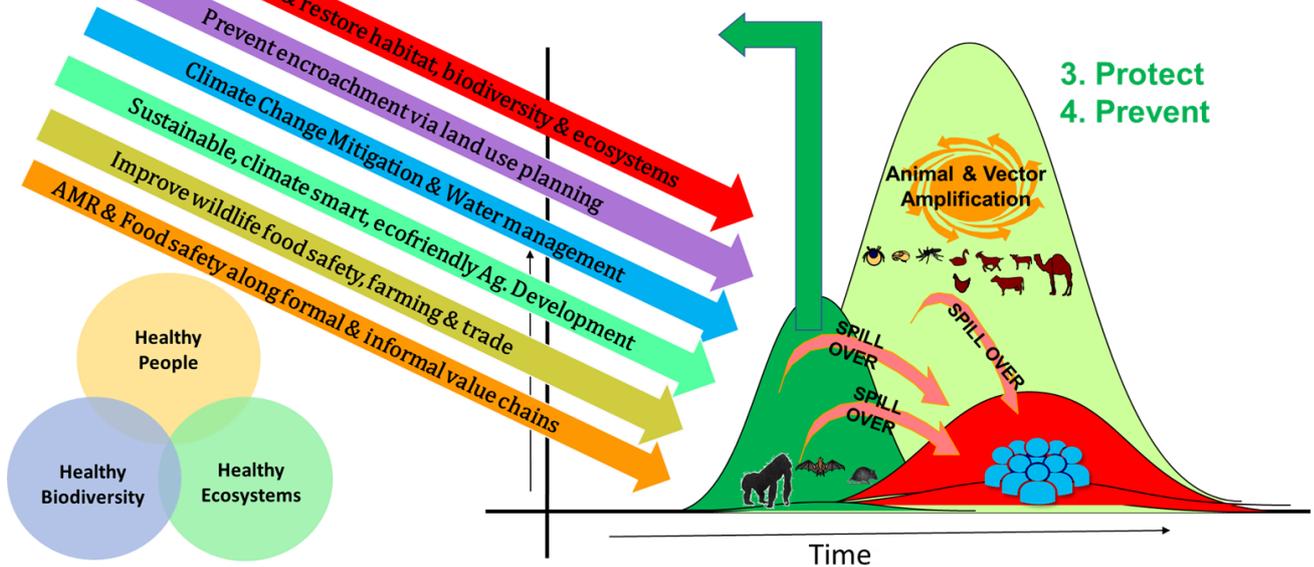


Figure 4. Traditional One Health interventions (top panel) and a glimpse into the new innovative upstream One Health interventions (bottom panel). Adapted from: Karesh et al. 2012.<sup>18</sup>

#### Tripartite Initiatives

<sup>18</sup> Karesh, W.B., Dobson, A., Lloyd-Smith, J.O., Lubroth, J., Dixon, M.A., Bennett, M., Aldrich, S., Harrington, T., Formenty, P., Loh, E.H., Machalaba, C.C., Thomas, M.J. & Heymann, D.L. Ecology of zoonoses: natural and unnatural histories. *Lancet*. 2012 Dec 1;380(9857):1936-45. (also available at: doi: 10.1016/S0140-6736(12)61678-X. PMID: 23200502; PMCID: PMC7138068).

19. FAO, the World Organisation for Animal Health (OIE) and the World Health Organization (WHO), commonly called the Tripartite, established a coordination mechanism in 2010 through the release of a *Tripartite Concept Note*, and in 2018 the Directors-General of the three Organizations signed a Memorandum of Understanding to address emerging and endemic zoonotic diseases (including food-borne diseases) and AMR.

20. Asia and the Pacific Regional Tripartite Coordination Group works under the One Health approach, focusing on zoonotic diseases (avian influenza and rabies), AMR and food safety. Asia and the Pacific Tripartite comprises five regional offices: FAO Regional Office for Asia and the Pacific (FAORAP, Bangkok); OIE Regional Representation for Asia and the Pacific (Tokyo); OIE Sub-Regional Representation for Southeast Asia (Bangkok); WHO Regional Office for South-East Asia (New Delhi); and WHO Western Pacific Regional Office (Manila). The Regional Tripartite Coordination Group is delivering a significant body of work,<sup>19</sup> including: multisectoral collaboration and zoonotic disease prevention and control; three Asia-Pacific workshops on multisectoral collaboration (2017, 2019, 2021); a joint article on “Operationalization of One Health and Tripartite Collaboration in the Asia-Pacific Region” (October 2020); finalizing the handbook “A Key Role For Veterinary Authorities and Animal Health Practitioners in Preventing and Controlling Neglected Parasitic Zoonoses (Taenia Solium, Trichinella, Echinococcus And Fasciola)”; collaboration on rabies elimination in the region; two World Food Safety Day webinars (June 2020 and 2021); a factsheet on food-borne parasitic zoonoses (September 2020); finalizing multisectoral AMR National Action Plans; strengthening AMR surveillance systems in the human, animal, agriculture and environment sectors; AMR stewardship, advocacy, awareness and communication campaigns across sectors, including World AMR Awareness Week celebrations (annually since 2017); and revising national legislation relevant to antimicrobials.

21. FAO and partners have supported and continue to support interventions to address the emergence of zoonotic diseases that have an impact on Asia and the Pacific region. These include HPAI, H5N1 in poultry, wildlife and humans (1996-1997), persistence of human rabies cases primarily transmitted through dog bites, Henipah Virus events (1998-1999), SARS (2002-2003), H1N1 pandemic (2009-2010) and SARS-CoV-2 (the current COVID-19 pandemic).

22. FAO and partners have supported interventions to address major animal disease epidemics including avian influenza, Foot and Mouth disease, Peste Petite Ruminant and, more recently, Lumpy Skin Disease and African Swine Fever. It is well established that diseases transmit in both directions (from livestock to wildlife and vice versa) and that prevention and control involves interventions and management of both sectors. FAO and partners routinely address the significant impact diseases have on both livestock and wildlife populations.<sup>20 21 22</sup> For example, Chytridiomycosis, an aquatic fungal pathogen, has resulted in global amphibian (frogs/salamanders) declines and extinction of at least 200 species. Another example is Peste Petit Ruminant, which in 2017 wiped out ten years of Saiga antelope conservation efforts by killing off over 80 percent of the critically endangered Mongolian Saiga antelope population through a mass mortality event.<sup>23</sup>

### ***Antimicrobial Resistance***

23. Antimicrobial agents are crucial substances for managing and sustaining health in humans and animals. Over the years, however, their rampant misuse and overuse in human medicine and animal production (including aquaculture) have ushered the world into an era where AMR has become increasingly more common and more serious. Today, according to WHO, AMR emergence and spread

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<sup>19</sup> FAO/OIE/WHO. 2020. Joint statement of intent to coordinate. (also available at <https://tr-asia.oie.int/wp-content/uploads/2020/11/soi-on-tripartite-coordination-final-20201023.pdf>).

<sup>20</sup> FAO. PPR kills endangered Mongolian antelope for the first time. (also available at <http://www.fao.org/news/audio-video/detail-video/en/?uid=12032>).

<sup>21</sup> FAO/OIE/IUCN. 2021. Conservation impacts of African swine fever in the Asia-Pacific region. (also available at <https://www.fao.org/3/cb5805en/cb5805en.pdf>).

<sup>22</sup> FAO. 2019. African Swine Fever in wild boar. (also available at <https://www.fao.org/publications/card/en/c/CA5987EN/>).

<sup>23</sup> FAO. 27 January 2017. Alarm as lethal plague detected among rare Mongolian antelope. (also available at <http://www.fao.org/news/story/en/item/463932/icode>).

is now one of the top ten global public health threats facing humanity, posing grave threat to modern medicine and to the sustainability of effective responses against infectious diseases.

24. In May 2015, the World Health Assembly adopted the Global Action Plan on AMR. FAO's Action Plan on AMR (2016-2020) was endorsed shortly after the 39th Conference (June 2015) and was recently updated. The two overarching goals of the FAO Action Plan on AMR (2021-2025)<sup>24</sup> are to: (i) reduce AMR prevalence and slow the emergence and spread of resistance across the food chain and for all food and agriculture sectors; and (ii) preserve the ability to treat infections with effective and safe antimicrobials to sustain food and agriculture production.

25. Guided by the five objectives of the FAO Action Plan, FAORAP has been working towards: (i) increasing stakeholder awareness and engagement on AMR; (ii) strengthening AMR surveillance and research; (iii) enabling good practices; (iv) promoting responsible use of antimicrobials; and (v) strengthening governance and equitably allocating resources. Initiatives are primarily focused on supporting and strengthening the food and agriculture sectors in an effort to reinforce their vital role and critical contributions to the multisectoral, multidisciplinary, global One Health issue of AMR.

26. Further to these initiatives centred on food and agriculture, FAORAP closely collaborates with the WHO, OIE and UNEP, raising multistakeholder awareness on AMR and advocating for responsible use of antimicrobials through jointly developed publicity materials (videos, joint press releases) and joint celebration of the annual World Antimicrobial Awareness Week. The regional Tripartite plus UNEP also collaborate to elevate AMR issues through high-level AMR advocacies, conferences, and meetings. Operationally, the regional Tripartite also works closely to: support the implementation of the Multi-Partner Trust Fund in selected countries in the region; coordinate global Tripartite plus UNEP initiatives such as the multistakeholder Partnership Platform on AMR; and develop joint or collaborative initiatives on such topics as surveillance and research, infection prevention and control, responsible use, and AMR governance.

### ***Food Safety***

27. Food safety protects the health of consumers, promotes trade in agricultural and food products and plays a crucial role in ensuring sustainable food and nutrition security. Food chains, whether of crops, fisheries, or livestock, are multisectoral and can be national, international, or global. Food control authorities need to confront the realities of the convergence of people, animals and the environment when framing regulations and developing codes of practices and standards. The borders between human, plant, environmental and animal health are no longer distinct; events in one sector profoundly impact the others as well as affect food safety. The ongoing COVID-19 pandemic has underlined the importance of a One Health approach.

28. The continuation of these good practices, most of them aligned with standards and norms published by the Codex Alimentarius Commission, beyond the pandemic will be important to maintain and continually improve food safety standards. Guidance from FAO and WHO on good hygiene, food safety and biosecurity is available and should continue to be followed.<sup>25 26</sup> This is especially relevant to domestic food production and food that is sold through informal markets and road-side vendors, which is a very common practice in Asia and the Pacific.

29. Asia and the Pacific region is home to a diversity of food control systems. The One Health framework is compatible with the food chain and science-based approaches that are already fundamental elements of food safety. For instance, certain zoonotic diseases are also food-borne illnesses, and effective control strategies could be focused on breaking the chain of transmission through animals, animal products and the environment. Similarly, promoting nature-positive production, and using nature-friendly inputs such as organic fertilizers and pesticides, can prevent upstream entry of food safety hazards. Promoting sustainable measures along the chain, such as

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<sup>24</sup> FAO. 2016. The FAO Action Plan on Antimicrobial Resistance 2016-2020. (also available at <http://www.fao.org/3/a-i5996e.pdf>).

<sup>25</sup> FAO/WHO. 2020. COVID-19 and Food Safety: Guidance for competent authorities responsible for national food safety control systems. (also available at <http://www.fao.org/3/ca8842en/ca8842en.pdf>).

<sup>26</sup> FAO. 2021. COVID-19: Guidance for preventing transmission of COVID-19 within food businesses (also available at <http://www.fao.org/3/cb6030en/cb6030en.pdf>).

reducing food loss and waste and minimizing their consequent spoilage, reduces food-borne risks, particularly in food-insecure countries. FAO has recently published a toolkit that addresses mainstream issues as well as those that receive limited attention from food control authorities and consumers.<sup>27</sup>

30. Situations exist in Asia and the Pacific where imports flow into a country from another country with virtually no checks of the paperwork or the products, and with labels in a language foreign to the importing country. As the food makes its way onto consumers' tables, there is little or no information of either its safety or compositional aspects. Effective import control systems are a potent tool that allow national authorities to focus scarce resources on the regulated entry and sale of foods that have diverse and sometimes unknown risks. This enables countries to create a balance between their trade facilitation commitments and their need to safeguard public health.

31. Countries need to have a knowledge-based system of risk categorization and risk-based inspection. This includes coordination with key national partners from phytosanitary, veterinary and quarantine agencies so that potential risks are foreseen and entry is regulated properly at the border points. FAO is incorporating the One Health approach into import control, especially within trade blocs, to create a more transparent, up-to-date and effective system.<sup>28</sup> Measures such as e-certification will unify multiple health, safety and quality certificates and support improved traceability.

32. Codex texts are science-based standards, guidelines and codes of practice compiled by the Codex Alimentarius Commission and its subsidiary bodies, taking into consideration advice provided by joint FAO/WHO expert bodies. To set Codex standards that are safe for people and applicable at the national level, Codex members need to actively participate in their development. It is also important for countries to have solid scientific knowledge on various topics covered by Codex Alimentarius. FAO is assisting countries to develop these capacities and incorporate Codex standards and recommended Codes of Practices across value chains. Scientific and technical capacity – including data generation, validation and analysis – is being enhanced in many Member Nations, including the Association of Southeast Asian Nations (ASEAN) regional grouping, to contribute to Codex standards-setting. Finally, scientific prioritization of hazards is a strategic and resource-saving option that allows risks to be analysed based on data that pave the way for evidence-based actions. The Asia and Pacific Regional Food Safety Conference organized by FAO discussed these and other issues.<sup>29</sup>

### **One Health Gaps in Asia and the Pacific**

33. Although the drivers of disease emergence and spillover are known, countries in the Asia and Pacific region lack comprehensive One Health programmes that effectively engage ministries of forestry, wildlife, natural resource management, and environment. Multiple approaches have been implemented in the region to enable national One Health programming and the establishment of national One Health policies, including the creation of One Health platforms, steering committees, Memoranda of Understanding and other coordination mechanisms. In the Asia and Pacific region, these formalized structures are the exception rather than the rule, and One Health policy at national and regional levels is largely absent, with the coordination on zoonotic diseases, AMR and food safety still largely influenced by only the medical and veterinary sectors.

34. In some countries where such One Health coordination mechanisms are in place, ministries of forestry, wildlife, natural resource management, and environment may not be included; alternatively, these sectors may not have an equal voice at the table. These ministries often do not understand how their technical expertise can support One Health efforts, and priority areas of national One Health

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<sup>27</sup> FAO. 2021. Layman's guide to food safety in the Asia and Pacific. (also available at <http://www.fao.org/3/cb4138en/cb4138en.pdf>).

<sup>28</sup> FAO. 2018. Ensuring the safety of imported food. (also available at <http://www.fao.org/3/CA0286EN/ca0286en.pdf>).

<sup>29</sup> FAO. 2021. Regional Food Safety Conference for Asia and the Pacific – Conference report, 17, 19, 24 and 26 November 2020. Bangkok. (also available at <https://doi.org/10.4060/cb3863en>).

programmes remain biased to serve the mandates of the veterinary and medical community (zoonotic diseases, AMR, and food safety).

35. One Health has yet to work on protecting or restoring biodiversity and ecosystems as upstream interventions to prevent and mitigate health threats – more of an ecohealth approach. Spillover risk mitigation measures are limited as countries typically take a partial One Health approach that includes the veterinary and public health sectors but leaves out the wildlife and environment sectors. This approach means that prevention is not a part of the solution, which places biodiversity and ecosystems at further risk of degradation and makes spillover events more likely.

36. The Field Epidemiology Training Programme (FETP) for medical professionals, the FETP-V for veterinarians, and the In-Service Applied Veterinary Epidemiology Training are in-service training programmes that support the ministries of health and veterinary services. There is currently no interoperable One Health training programme for in-service professionals from the ministries of forestry, wildlife, and natural resource management. Financial and human resource investments are needed to support these ministries to complement ongoing One Health programmes and to expand One Health at the national level. Furthermore, medical and veterinary professionals have never received training on the importance of the interlinkages between biodiversity conservation, health and the environment, how environmental destruction contributes to disease emergence, and the importance of One Health with respect to the environment.

37. The One Health approach is based on the recognition of the interdependent nature of humans, animals and their shared environment, and therefore should incorporate gender aspects. However, gender perspectives in One Health are still limited in the region, including research on gender and One Health and programmes addressing gender issues, possibly because of the lack of relevant expertise. There is a rationale to integrate gender aspects in the One Health interventions and programmes, but in many cases technical loopholes such as lack of expertise, data, and guidelines, among others, may hamper the gender mainstreaming process.

## **I. Transforming One Health in Asia and the Pacific Region**

38. An Environment Sector Needs Assessments and Scoping Tool needs to be developed to determine the role of and extent to which ministries of forestry, wildlife and natural resource management contribute to One Health at the national level. The tool will also evaluate individual and institutional training and capacity gaps in the areas of biodiversity, ecosystems, wildlife, and One Health. Piloting the tool in the region and proceeding with a broader subregional or regional rollout would support the development of a subregional/regional environment sector training implementation plan, which will summarize the training needs, next steps and include a timeline with activities and milestones.

39. An interoperable One Health training programme needs to be developed for in-service environment sector professionals that serves as a complement to in-service training programmes supporting public health (FETP) and the veterinary sector (FETP-V). The proposed Field Training Programme for Wildlife, Ecosystems, Biodiversity, the Environment, and the In-Service Training Programme for Forestry, Wildlife and Natural Resource Management Professionals will strengthen individual and institutional capacity to participate interoperably with public health and veterinary professionals to prevent and respond to zoonoses, AMR, and food safety health threats, to support One Health policies and interventions at national level, and to ensure that biodiversity, ecosystems and natural resources are protected and managed to optimize health benefits.

40. The capacity of medical and veterinary sector professionals and institutions can be strengthened by developing environmental training for in-service public health and veterinary professionals, including the importance of the interlinkages between biodiversity conservation, health and the environment, how environmental destruction contributes to disease emergence, and the importance of One Health with respect to the environment sector.

41. One Health can also be adopted to mitigate the various negative externalities of agricultural pest management, including Fall Armyworm and desert locust. Comprehensive strategies will be developed to defuse the impacts of crop protection on human, animal and environmental health (including zoonotic disease emergence). In programmes that address transboundary plant pests/diseases, FAO will favour tools and technologies that represent no or minimal public health risks. These include agro-ecological farming tactics, crop/farm diversification schemes and green technologies, e.g. semio-chemicals, biopesticides or invertebrate biological control agents. FAO will equally assist in benchmarking agrochemical pollution levels across the human-animal-environment interface and in unveiling causal patterns between pollutant exposure, disease (zoonotic, vector-borne) emergence and (non-communicable) human diseases.

42. One Health should be expanded to be more inclusive of the ministries and professionals responsible for wildlife, biodiversity, natural resource management, ecosystems, and the environment. Expansion includes partnerships, programmes and ongoing collaborations including the Global Framework for Transboundary Animal Diseases Regional Steering Committee, the Regional Tripartite Coordination Group plus UNEP, the Asia and Pacific Commissions (Animal Health and Production, Plant Protection, Forestry), and within regional economic communities (ASEAN, South Asian Association for Regional Cooperation, and the Pacific Community, formerly the South Pacific Commission), to name a few. As many of the technical challenges at hand are linked to wildlife management and issues at the human-wildlife-livestock interface, natural resource managers can contribute significantly to improved One Health collaborations.

43. Global food safety can benefit from data, information, science, technology, and innovation. FAO will continue assisting its Members and to support capacity development for data generation and collection on physical, chemical and microbial hazards and encourages the use of high-throughput technologies such as whole genome sequencing and bioinformatics.<sup>30</sup> Agrifood systems transformation can mean many different things but in the context of One Health, raising awareness of all actors along food value chains about the risks of food-borne pathogens and zoonoses is paramount. Risk assessments indicate that the risk of disease spillover along livestock and wildlife food chains, from forest or farm to fork, is a very real issue, especially in poorly managed or informal animal production systems or value chains. Additional effort and inputs will be required to improve: safe farming practices for livestock and wildlife farms; biosecurity at farms and along value chains; hygiene and waste management at farms, slaughter points or abattoirs; food safety at food stalls, open markets and informal markets; and cold chain and food handling all the way to the point of sale.

44. Whether in response to natural disasters, civil unrest, new disease outbreaks or a food security crisis, governments will need to engage through their emergency management systems. Having an integrated systems approach in place, inclusive of all relevant sectors, and with a coordination modality to respond to these emergencies should make governments more efficient and better at mitigating the impact of the crisis. Therefore, in the context of crisis management, an overarching emergency management system needs to be established and function “during peace and war times”, to engage necessary One Health partners beyond the traditional veterinary and public human sectors. FAO has recently developed the Progressive Pathway for Emergency Preparedness tool, which is based on the actions and steps in the FAO Good Emergency Management Practices Guide. FAO is considering undertaking an assessment of countries in the region, in close cooperation with national veterinary services and other relevant One Health partners in-country.

45. Wildlife is the primary resource that many indigenous communities rely on for livelihoods as well as food and nutrition security. The key to ensuring that this resource remains available is to support sustainable use approaches, and to identify culturally acceptable alternative protein sources. As many indigenous communities lack medical infrastructure, good hygiene, food safety or disease prevention and control measures, as well as awareness about zoonotic disease, FAORAP (Forestry and Animal Health & Production) will consider developing a discussion paper on Health, Wildlife &

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<sup>30</sup> FAO. 2021. Risk profile - Group B Streptococcus (GBS) – *Streptococcus agalactiae* sequence type (ST) 283 in freshwater fish. Bangkok. (also available at <https://doi.org/10.4060/cb5067en>).

Livelihoods focused on the interlinkages between sustainable wildlife management, zoonoses, indigenous people and local communities.

46. Finally, FAO will continue to strengthen and expand One Health Tripartite collaborations on zoonoses, food safety and AMR with WHO and OIE, through the Regional Tripartite Coordination Group, Codex Alimentarius and International Plant Protection Convention standards. The partners have also agreed to expand their commitment to strengthening multisectoral coordination and efforts to combat health threats associated with interactions between humans, animals and the environment and collaborate with the UNEP Regional Office for Asia and the Pacific to participate in the Regional Tripartite Coordination Group.