

# Accelerating One Health in Asia and the Pacific



# HEALTH



**Environment  
and Development**



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# Summary

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The health of humans, animals, and the environment are closely intertwined—human health in particular heavily depends on the health of the others. Unsustainable practices in agriculture, natural resources management, and urbanization, as well as international movement, and the increasing use of antibiotics negatively impact the health of the environment and the species that live in them, humans included.

The One Health concept recognizes these connections between humans, animals, plants, and the environment and promotes collaboration between multiple levels, sectors, and disciplines to address the multifaceted environmental challenges that the Asia-Pacific region faces. It is a key approach to mitigating and managing the risk of zoonoses, to address anti-microbial resistance as well as issues related to plant and animal health, and food safety.

While One Health is not a new concept, it could be strengthened to encompass the full scope of the environment and its implementation faces multiple challenges: the lack of political support, financing, capacity building, monitoring, and evaluation as well as surveillance. Moreover, a strengthened collaboration between all relevant disciplines and actors, and at all levels is required to ensure impactful application of One Health concept in Asia and the Pacific and effective contributions to the 2030 Agenda for Sustainable Development.

# I. Introduction

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Advances in agriculture, medicine, economic opportunity, and global trade have had significant positive impacts towards human health and welfare by tackling issues such as food insecurity, poverty, diseases, and inequality. However, many of these advances have resulted in unsustainable practices, contributing to the issues they aim to address. Changes in ecosystems and land use, intensification of agriculture, encroachment in wildlife habitat, urban sprawls, and international movement (i.e., travel and trade) contribute to climate change, environmental degradation, biodiversity loss, and disease transmission. Additionally, improper use of antimicrobials and pesticides, applied to address health risks and enhance agricultural productivity, can also have negative health impacts.

These consequences have profound impacts on the health of the environment and the species that reside in them, humans included. It is therefore critical to understand the connections between humans, animals, and the environment to ensure a healthy and sustainable relationship—as degradation in the health of animals or the environment ultimately impacts human health.

This paper aims to provide evidence on the added value of taking a holistic and collaborative approach to improving the health and well-being of humans, animals, and the environment in Asia and the Pacific. Specifically, this paper will focus on the concept of One Health as a framework to address the interconnected risks between humans, animals, and the environment and to support progress towards achieving the Sustainable Development Goals (SDGs).

# II. What is One Health?

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“One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems. It recognizes that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development” (OHHLEP, 2022).

One Health has recently received significant attention due to the COVID-19 pandemic and its zoonotic underpinnings. Whilst traditionally focusing on human and animal health, to reduce the emergence and re-emergence of infectious diseases with animal origins, such as COVID-19, at the human-animal-environment interface (Schneider et al., 2019; World Bank, 2018), the concept and application of One Health has evolved to include disciplines in ecology and social sciences over the past decade (World Bank, 2018), as well as antimicrobial resistance (AMR) and food safety. The inclusion of environmental sciences in One Health is particularly important as protecting biodiversity and ecosystems can better inform disease risk management and preventive actions to achieve the best outcomes.

The United Nations system has been taking steps to consolidate One Health at the global, regional and national levels. For instance, the Food and Agriculture Organization (FAO) has produced a “Strategic Action Plan on One Health” and developed a programme on “Strengthening and Extending the One Health Approach to Avert Animal-Origin Pandemic 2020-2024”. The World Health Organization (WHO) has developed a “One Health Approach for Action Neglected Tropical Diseases (2021-2030)” and tools to inform national strategic health planning (e.g. OneHealth Tool). Strategic frameworks have also been developed in the context of the collaboration between the Tripartite (FAO, WHO and OIE) and UNEP, including the “Strategic Framework for Reducing Risks of Infectious Diseases at the Animal–Human–Ecosystems Interface” or the “Strategic Framework for Collaboration on Antimicrobial Resistance”. In 2021, the Tripartite also launched a regional One Health partner platform which aims to bring together relevant stakeholders in an effort to tackle the human, animal and environmental health challenges. The Tripartite and UNEP will continue to coordinate and implement One Health activities, particularly through the guidance of the One Health Joint Plan of Action (2022-2026).

Notably, the Ministerial Declaration adopted at the 5th United Nations Environment Assembly (UNEP/EA.5/HLS.1) recognizes the risk of future pandemics and other health risks if humanity doesn't overhaul its patterns of interaction with nature by adopting a holistic approach such as One Health.

Countries around the world have also adopted the approach: in the United States of America, the Centre for Disease

Control and Prevention has, for example, launched the One Health Zoonotic Disease Prioritization programme, aiming to bring together representatives from human, animal, and environmental health sectors, as well as other relevant partners, to prioritize zoonotic diseases of greatest concern (CDC, 2020). The successful implementation of such initiatives relies on the support provided at regional and national levels in support of countries' effort to prevent disease transmission.



Source: Clément Falize on Unsplash

# III. Why One Health?

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The concept and importance of One Health has been gaining renewed attention due to recent developments in human health challenges. Since the early 2000s, the world has faced numerous infectious diseases with animal origins such as severe acute respiratory syndrome (SARS), influenza A (H1N1), Middle East Respiratory Syndrome (MERS), Ebola, Zika virus, and COVID-19, with significant human health and economic impacts.

Ecosystem degradation, biodiversity loss, and climate change further exacerbate public health challenges at the human-animal-environment interface. Changes in biodiversity and ecosystems can not only cause impacts on human health through increased frequencies of disease outbreaks, but they may also affect agricultural production, hence food security through the loss of pollinators and other ecosystem services such as water regulation, soil regeneration, and regulation of climate, noting that climate change will continue to affect biodiversity

and all ecosystems, as well as the physical and mental health of human populations (IPCC, 2022).

Given the interconnectedness between people, animals, plants and the environment, defaulting towards one discipline or perspective results in only having partial understanding of the issue—thus only able to develop partial or temporary solutions (Wilcox et al., 2019). Further, as biodiversity and ecosystems protection and climate change transcend national boundaries, it is critical for policymakers to take a holistic, integrated, and collaborative approach such as One Health to address health threats at the human-animal-environment interface.

Importantly, adopting One Health approaches can assist countries with progress in other national priorities such as poverty alleviation, economic growth, and food security, towards achievement of their Sustainable Development Goals.

## ONE HEALTH APPROACH



An estimated 60% of known infectious diseases in humans originate from animals



Deforestation and biodiversity loss increases risk of exposure of humans and livestock to new pathogens



AMR-related human deaths in Asia are expected to rise to 5 million/yr. by 2050



Up to 40% of global crop production is lost to pests (i.e., insects, pathogens, weeds)



It is estimated that 20% of animal production losses are due to diseases



Note: The associated elements are not all inclusive.

One Health enables multiple sectors and stakeholders engaged in human health, terrestrial and aquatic animal health, plant health, food production, and the environment to collaborate to improve outcomes essential to achieve the Sustainable Development Goals (SDGs).

Reduce Antimicrobial  
& Pesticide Use

Ecosystem  
& Biodiversity  
Conservation

Address Climate  
Action & Environmental  
Pollution

Strengthen Regional  
Partnerships &  
Governance

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## A. ZOONOSES

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Zoonoses are infectious diseases transmitted from vertebrate animals to humans and are a major concern making up an increasing proportion of newly identified infectious diseases in addition to many existing ones (WHO, 2020). Approximately 60 percent of human infections derive from animals and, of all new and emerging human infectious diseases, 75 percent jump from animals to people (UNEP, ILRI, 2020). Researchers estimate that between 650,000 – 840,000 potential zoonotic agents exist today but have yet to cross the species barrier (Carroll et al., 2018).

While zoonotic diseases can be traced back many centuries, numerous zoonotic pandemics and pandemic-like emergencies have emerged in the last century, such as waves of influenzas (1918 Spanish flu, H5N1 in 2003, H1N1

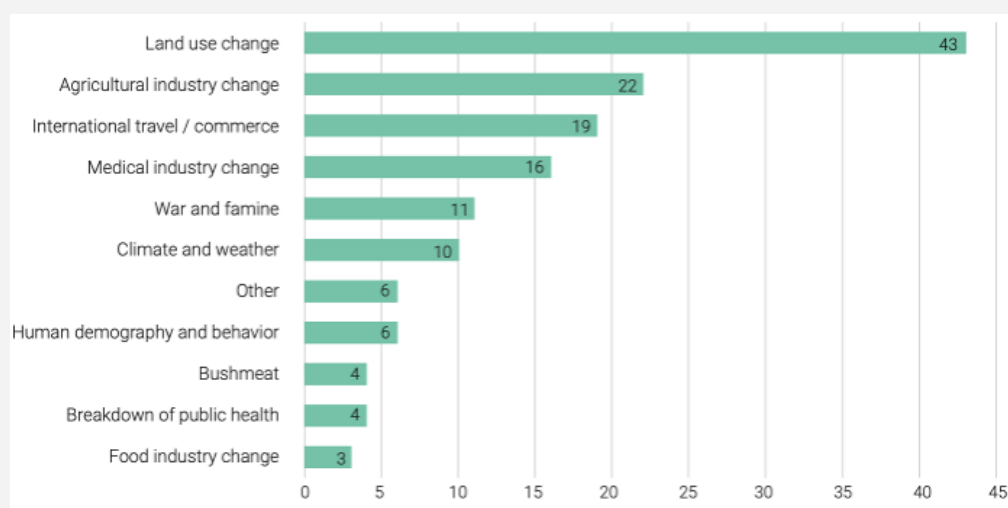
in 2009), HIV/AIDS (recognized in 1981), SARS (2002-2003), MERS (2012), Ebola (2014), Zika (2015), and COVID-19 (2019). South and Southeast Asia are hotspots for emerging infectious diseases (EIDs), with the Avian influenza crisis in 2003-2004 being a turning point for One Health approach in these sub-regions. The crisis highlighted the absence and importance of a functional coordination mechanism between public health and animal health sectors (Allen et al., 2017; Gongal et al., 2020).

Zoonoses are closely linked to environment and development patterns and drivers include changes in human demographics, the use of land, agricultural intensification, wildlife trade and climate change.

Figure 1 below illustrates the main drivers of zoonoses and highlights that land use change as the leading cause of global disease outbreak during the 1940-2004 period, with other environmental factors, such as climate and weather and bushmeat.



**FIGURE 1: NUMBER OF INFECTIOUS DISEASE EVENTS,  
GLOBAL, 1940-2004**

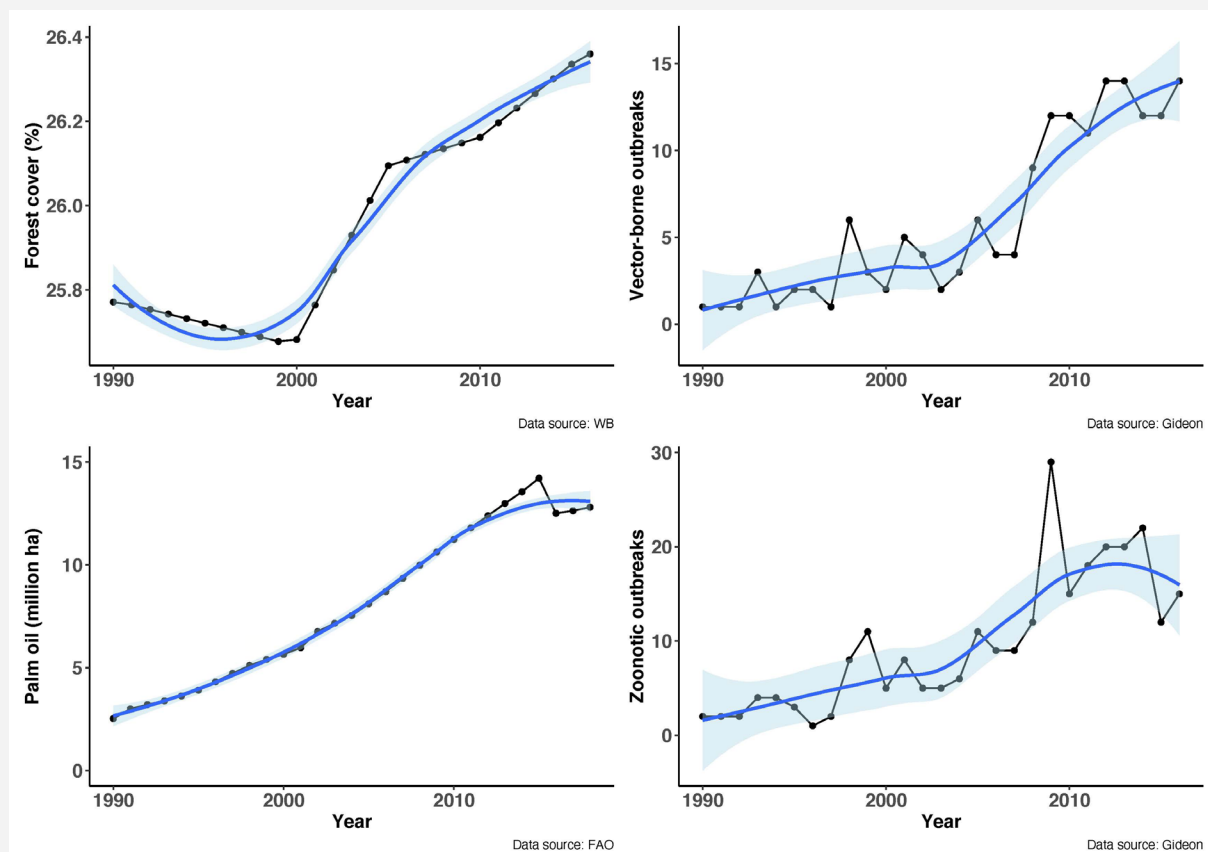


Source: Adapted from Loh and others, 2015

In Asia and the Pacific, land use change for urbanization and food production represents 43 per cent of all threats to biodiversity and ecosystems even though these trends might be lower than in other regions of the world (WWF, 2020). With ecosystem degradation, species are forced to shift habitats with many moving into increasingly smaller areas, or new semi-natural habitats, which further enhances the interface between wild species, livestock, and humans. Research also suggests that endangered biodiversity is a factor of emerging infectious diseases (EIDs) (Morand et al., 2014).

Whilst globally, the rise in vector-borne and zoonotic diseases outbreaks is associated with significant reductions in forest cover (Morand et al., 2014), in South and Southeast Asia (Figure 2), a complex dynamic is observed between disease outbreaks, deforestation, and afforestation with monospecific plantations (i.e., palm oil). In these subregions, disease outbreaks are associated with an increase in forest cover that relates to the expansion of palm oil plantations, whilst deforestation of natural forests is still being observed. This comes at the expense of natural habitats and ecosystems services that can negatively impact biodiversity loss and contribute to the rise of disease outbreaks.

**FIGURE 2: SOUTH AND SOUTHEAST ASIA TRENDS OF DISEASE OUTBREAKS, FOREST COVER CHANGE, AND PALM OIL EXPANSION**



Source: Morand and Lajaunie, 2021

Pollution and climate change also contribute to habitat and biodiversity loss, respectively accounting for 11 and 5 per cent of threats to species populations in the Asia-Pacific region (WWF, 2020). The impacts of climate change amplify environmental risks and result in complete removal, fragmentation, or reduction in quality of key habitat through biodiversity

degradation. Changes in temperature and higher annual rainfall as a result to climate change can impact the movement pattern of disease vectors, which favors the spread of pathogenic animals and accelerates the rate of disease transmission. Such drivers can cause insect vectors to move into habitats at higher latitudes, leading to shifts in the scope of disease spread (Qianlin et al., 2021).

Additionally, Asia being the host of the largest illegal wildlife trade in the world due to its popularity as traditional medicines, tonics, delicacies, or symbol of wealth (Yamada et al., 2014), positions the region as a potential conduit for emergence and international spread of zoonotic diseases. Markets where wildlife is legally traded are often unregulated and disregard animal welfare and are therefore considered high-risk areas for zoonotic diseases to emerge. Given the high economic value of transnational wildlife trade, estimated at around USD 220 billion annually (ADB, 2021), unregulated trade is likely to prevail. This process will not only significantly contribute to the extinction of vulnerable wildlife but will also constitute persistent health threats to humans.

Therefore, changes in land use due to deforestation, changes in wildlife populations due to climate change, and the exploitation of wild species have not only added pressure on limited resources but are also key factors in the cross over from wild species to livestock and humans (IPBES, 2020).

Considering the interconnectedness between the environmental drivers of zoonoses, policy responses must be considered in the context of climate change risks. Further, a multi-sectoral response spanning both humans, natural ecosystems and those used for agriculture is required in accordance with a One Health approach towards controlling zoonoses to target the root cause of the virus transmission.



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## B. ANTIMICROBIAL RESISTANCE

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According to the World Health Organization (WHO), humanity may be entering a post-antibiotic era where simple, and previously treatable bacterial infections can kill (WHO, 2014).

Antimicrobial drugs are used on humans and agriculture (i.e., crops and animals) to fight against infections caused by bacteria (antibiotics), fungi (antifungals), parasites (antiparasitic, antimalarials), and viruses (antivirals); and antimicrobials can be used in livestock production for growth promotion or improving feed conversion efficiency. However, micro-organisms can develop resistance to antimicrobial drugs, leading to drug-resistant bacteria such as tuberculosis and ‘superbugs’ such as Methicillin-resistant *Staphylococcus aureus* (MRSA). While resistance to antimicrobials is a natural process, the overuse and misuse of antimicrobial drugs has resulted in the increased rate of AMR (O’Neill, 2016).

It has been estimated that deaths from AMR could rise to 10 million lives annually by 2050 with a cumulative cost to global economic output of 100 trillion USD (O’Neill, 2016), and that antimicrobial resistant (AMR) infections may become the leading cause of death globally by 2050 (O’Neill, 2014). Asia is the largest hotspot of AMR in animals, Southeast Asia being an epicenter (Chua et al., 2021).

Concerns are also growing over the impact of antimicrobial resistance on the environment. Research indicates that the release of antimicrobial compounds into the environment is driving bacterial evolution and the emergence of more resistant strains (UNEP, 2017). This is a result of natural bacteria coming into contact with discharged resistant bacteria from households, hospitals and pharmaceutical facilities and agricultural run-offs. UNEP estimates that up to 75% of antibiotics used in aquaculture may be lost into the environment (UNEP, 2017), making it an important reservoir for AMR.

Pharmaceuticals, including antibiotics, and their metabolites can enter the environment through multiple pathways - manufacturing sites, untreated wastewater from households and hospitals, wastewater treatment plants, and municipal waste streams as well as aquafarming (Kümmerer et al., 2019) - and there is evidence that multi-drug resistant bacteria are prevalent in marine waters and sediments close to aquaculture, industrial and municipal discharges (UNEP, 2017). In addition, it is believed that places with inadequate water supply, sanitation and hygiene favor AMR development and spread (The South Center, FAO, & UNEP, 2021). Drinking and recreational water can contain both resistant organisms, as well as antimicrobial drug residues. Wildlife can be colonized with drug resistant organisms by coming into contact with discharge from wastewater treatment plants, or livestock farms where antimicrobials are used. Therefore, improved monitoring and surveillance systems to identify where

antimicrobial resistance is found in the environment and adequate management of freshwater and coastal water quality are critical to inform policy solutions.

Abusive use of antibiotics can result in higher concentrations of antibiotics and drug-resistant microbes being released into the environment (i.e., antibiotics pollution) through animal waste streams (Manyi-Loh et al., 2018) and can also lead to accumulation of antibiotic residues in food products. Consumption of food products with antibiotic residues over a prolonged period can have detrimental impacts on human health, including drug resistance, drug hypersensitivity reactions, carcinogenic, mutagenic, teratogenic, and immunologic effects, disruption of normal intestinal flora, nephropathy, hepatotoxicity, and reproductive disorders (Beyene, 2015; Manyi-Loh et al., 2018; Nisha, 2008).

The One Health approach can support the understanding of the extent to which the transmission of resistant bacteria can occur by direct contact with the environment and help mitigate risks.

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## C. ANIMAL WELFARE AND HEALTH

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Animal welfare is defined as the “physical and mental state of an animal in relation to the conditions in which it lives and dies” (Doyle, et al, 2021). The spillover of zoonotic diseases into humans and overuse of antimicrobials have their root causes in poor animal welfare. Poor accommodation, aggressive handling, and painful procedures have shown to increase exposure to diseases and increase stress which affect immune functions—having severe consequences for animal health, including delayed wound healing and impaired responses to vaccinations (Staley et al., 2018; Tarazona et al., 2019).

Good animal welfare will translate into financial benefits through improved health, reduced mortality, improved resistance to disease and reduced medication, in addition to lower risk of zoonoses and animal-borne infections.



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## D. PLANT HEALTH, AND FOOD SAFETY

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The Asia-Pacific region has a population of 4.6 billion people, and it is estimated to rise to 5.2 billion by 2050 (ESCAP, 2020). To feed a region that accounts for nearly 60 percent of the global population, it is important to have productive and sustainable agriculture and aquaculture. Plants provide 80 percent of food consumed by humans and are a primary source of nutrition for livestock (Rizzo et al., 2021). Thus, plant health has important consequences for human and animal health as an important driver of food security and safety in addition to a source of livelihood in farming, of phytomedicine/ pharmaceuticals, and for sustainable land management (Dollinger & Jose, 2018; Vannoppen et al., 2017).

To meet growing consumer demand for food products, farmers utilize antimicrobials and pesticides to improve productivity, protect from crop losses, and control vector diseases. However, the excessive and extensive use of highly hazardous

pesticides (HHPs) have direct and indirect negative effects on human and ecosystem health: they contaminate and accumulate in plants, air, biota, water, and soil which expose and increase risk to soil organisms and other higher organisms (i.e., animals and human) through direct application or consumption (Aktar et al., 2009; Sharma et al., 2019). Four of the top 10 pesticide consuming countries of the world area are in Asia: China, Thailand, India, and Japan (Sharma et al, 2019). Further, 50 HHPs are being used by small-scale farmers and agricultural workers in several countries in Asia (UNEP, 2019) and the annual increase in import of pesticides in countries such as Cambodia, Laos and Vietnam have been 61, 55, and 10 percent, respectively (Sharma et al., 2019).

Intensive agriculture and agrochemicals affect the ecology of soils and watercourses and the indiscriminate use of antibiotics, causing AMR. Unsustainable agricultural practices also result in loss of biodiverse landscapes, reduction of agro-biodiversity and pollution, presenting new challenges in food safety and food security, reducing the long-term resilience of agricultural systems to environmental and climate changes and increasing zoonotic disease risk.

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## E. FOOD BORNE PATHOGENS

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Foodborne pathogens are a significant threat to human health and the economy. Foodborne pathogens (e.g., bacteria, viruses, parasites) are ingested with contaminated food and can cause fever, nausea, vomiting, abdominal pain, diarrhea, headaches, and even death (Bintsis, 2017). Livestock is a major reservoir of foodborne pathogens, and its waste can contaminate crops through soil and unclean water (Heredia & Garcia, 2018). Inadequate policy attention and the lack of investment prioritization slows development of national food safety management systems in low- and middle-income countries (LMICs) (e.g., scientific evidence, necessary infrastructure, trained human resources, food safety culture, and enforceable regulations) (Jaffee et al., 2018). Total productivity loss due to foodborne diseases in LMICs is estimated at 95.2 billion USD per year, with LMICs in Asia accounting for 66 percent (63.1 billion USD) (Jaffee et al., 2018).

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## F. ONE HEALTH AND THE SUSTAINABLE DEVELOPMENT GOALS

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The 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) are an urgent call for action by all countries. The SDGs recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests (United Nations, 2015). Due to the SDGs' cross-cutting and interlinked nature, successful application of One Health approaches can play a strong role in achieving the SDGs, in particular SDG 3 on Good Health and Well Being, in supporting sustainable land management and agriculture (SDG 2- Zero Hunger) and environmental protection (SDG 15- Life on Land, SDG 6 - Clean Water and Sanitation, SDG 14 -Life Below Water) as well as sustainable consumption and production (SDG 12), to name only a few. The successful application of a One Health approach can therefore contribute to the achievement of the 2030 Agenda for Sustainable Development.

# IV. One Health Challenges & Gaps

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While the concept of One Health has gained traction in recent years, a lack of inclusion of the environmental sector in One Health initiatives has been observed. Further, the implementation of One Health initiatives has been faced with implementation challenges, including the need for more collaboration between countries.

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## A. WEAK ENVIRONMENTAL DIMENSION

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While coordinating and collaborating across disciplines, sectors and borders is needed to achieve positive health outcomes for humans and animals, it is equally imperative to acknowledge and address the drivers of environmental, human and animal health degradation. Whilst the One Health framework has heavily focused on detecting and responding to zoonotic diseases in addition to addressing AMR and food safety, it has yet to place more attention to protecting and restoring biodiversity and ecosystems, as well as combatting climate change and pollution and ensuring sustainable land-use planning as upstream interventions to prevent disease emergence. While activities such as the programme on highly pathogenic emerging

diseases (HPED) in Asia—implemented by the One Health WHO-OIE-FAO tripartite and in consultation with the secretariats of Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC)—have taken steps to endorse One Health to address issues at the human-animal interface, progress towards enhancing and institutionalizing One Health further is needed to fight against future pandemics and address their drivers, including its numerous environmental drivers, in an integrated manner.

In addition, One Health approaches have been very useful in properly engaging the public health and veterinary services sectors; however, not much has yet been done to also engage ministries and agencies responsible for forestry, wildlife, natural resource management, agriculture, land use planning, climate, and the environment in general.

The One Health Joint Plan of Action (2022-2026) identifies four key priorities to support the integration of the environment into the One Health approach. Focusing on these priorities can help better understand environmental interlinkages and implement One Health in a more harmonized way (WHO, OIE, FAO, UNEP, 2022):

**Action 1: Protect, restore, and prevent the degradation of ecosystems and the wider environment.** This action aims to promote a better understanding of the health threats posed by environmental degradation to nature and people. It also aims to promote partnerships with civil society, the private sector, and governments to adopt policies, legislation and practices that promote the sustainable management of nature, ensure healthy ecosystems and communities, and prevent encroachment by urban centres.

**Action 2: Mainstream the health of the environment and ecosystems into the One Health approach.** This action aims to integrate the mandates, priorities, functions and knowledge of the forestry, wildlife, biodiversity, natural resource management and environment sectors into One Health. The objective is to promote and support more inclusive One Health policies, plans and actions.

**Action 3: Integrate environmental knowledge, data, and evidence in One Health decision-making.** This action aims to better integrate environment sector-sourced data and evidence at all levels of decision making with the objective to protect biodiversity and the wider environment, promote sustainable development, and identify and mitigate health threats.

**Action 4: Create an interoperable One Health academic and in-service training programmes for the environment, medical, agriculture and veterinary sector professionals.** This action aims to strengthen the capacity of natural resource management and environment sector professionals and institutions to participate with human and animal professionals addressing zoonoses, AMR, food safety and health threats and to support One Health policies, legislation, and interventions. Additionally, it aims at strengthening decision-making on health and development by ensuring that all sectors are adequately equipped to collaborate and integrate priorities of all sectors.

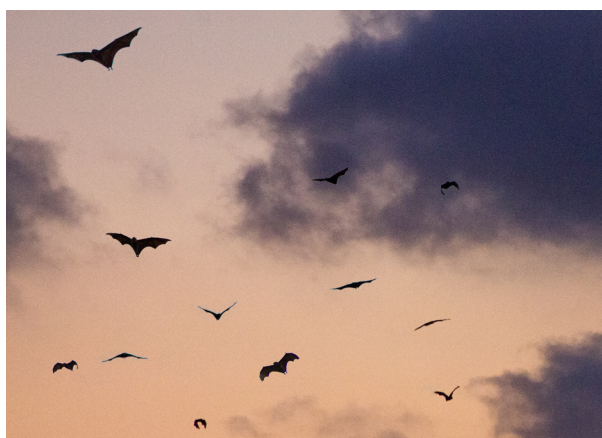


## **BOX 1: NEW ONE HEALTH APPROACHES TO ADDRESS ZONOTIC DISEASES IN CAMBODIA, (CDC, 2021).**

Cambodia has taken steps to harmonize the application of One Health initiatives, including through the inclusion of environmental professionals in training programs and workshops. In an effort to control and prevent outbreaks of zoonotic diseases such as avian influenza and rabies, the country created the Cambodian Veterinary Epidemiology Training (CAVET) in 2012 with the aim to strengthen the One Health approach involving human, animal and environmental health sectors.

The programme relies on a multisectoral group of professionals, including with significant expertise in environmental health. It also provides classroom and field-based training experience to its participants. Classroom instructions include presentations from national and international human, animal and environmental health experts and participants conduct investigations in close cooperation with environmental health agencies, allowing them to detect source of disease outbreaks more effectively. For instance, in March 2021, animal health experts detected an avian influenza A (H5N1) virus outbreak in free-ranging wild birds. CAVET graduates used their training to identify that the likely source of the outbreak was migratory birds.

The One Health Joint Plan of Action (2022-2026) also provides disease-specific guidance by further integrating the environmental aspect of One Health (FAO, OIE, WHO, UNEP, 2022), outlining a set of concrete activities in relation to each action.



Source: Clément Falize on Unsplash

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## **B. IMPLEMENTATION CHALLENGES**

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A systematic literature review (Ribeiro et al., 2019) has identified challenges for designing and implementing One Health initiatives and categorized them into three chronological process phases: (1) conditions for starting, (2) execution, (3) monitoring and evaluation and (4) financing.

**Conditions for starting** challenges relate to difficulties for One Health practitioners start their initiatives, such as policy prioritization, funding, and educational and training programmes.

## **BOX 2: ONE HEALTH COLLABORATION IN UZBEKISTAN: ADDRESSING ZONOTIC DISEASES THROUGH PRIORITIZATION AND PLANNING (CDC, 2019).**

Uzbekistan faces challenges in controlling and preventing zoonotic diseases. The government of Uzbekistan recognizes the threat posed by zoonotic diseases and has been taking steps to improve the country's capacity to prevent, control, detect, and treat disease outbreaks by conducting a series of roundtable discussions and the implementation of strategic methodologies and tools.

For instance, in 2018, Center for Disease Control and Prevention' staff and representatives from Uzbekistan's Ministry of Health, State Veterinary Committee, Ministry of Emergency Situations, and State Committee for Ecology and Nature

Protection facilitated a One Health Zoonotic Disease Prioritization ([OHZDP](#)) Workshop. This initiative helped identify Uzbekistan's zoonotic diseases of greatest concern and engage in strategic planning. The OHZDP tool is a country-owned process that allows participants from multiple sectors to select and rank criteria to define the national importance of zoonotic diseases, generating a final list of the top priority zoonotic diseases for multisectoral, One Health collaboration. Using the OHZDP tool can help guide discussions on how to enhance public health capacity building efforts, best use resources, and further collaborate on prevention and control efforts for the prioritized zoonotic diseases.

**Execution** challenges relate to issues in surveillance and collaboration between multiple actors in multiple disciplines at the local, national, and regional levels. Problems with surveillance include difficulties performing surveillance due to lack of resources, personnel, and legal basis for integrated surveillance across different domains (animal, environment, human health systems); difficulty accessing quality data; lack of surveillance capacity; and fragmented surveillance systems. Difficulties in collaboration are observed between actors, disciplines and levels, as well as lack of facilitated collaborative process; siloed thinking; and lack of engagement between stakeholders. The Tripartite advocates for effective

multisectoral, multidisciplinary, and transnational collaboration at the local, national, regional, and global levels (FAO, OIE, WHO, 2019). There is also a need to improve the dialogue between science and policy in relation to the encompassing role of the SDGs (Lajaunie & Morand, 2021).

**Monitoring and Evaluation** is critical in providing clear evidence on the effectiveness and efficiency of any initiative, as it supports adoption, upscaling, and institutionalization. Evaluation studies of One Health initiatives are sparse. It is therefore important to conduct evaluation studies and report outcomes in addition to developing specific One Health indicators and metrics for monitoring and evaluation.

### **BOX 3: ONE HEALTH MONITORING TOOL FOR THE PREVENTION AND CONTROL OF ZONOSSES IN INDONESIA (WICAKSONO, ET AL, 2019)**

Since 2005, Indonesia has become one of the epicenters in Asia for human and animal H5N1 avian influenza infections. The detection of Ebola in Orangutans (Nidom, et al, 2018) and scares of Ebola and Middle East Respiratory Syndrome in the country emphasizes the importance of strengthening national capacities to detect threats to human health. In 2016, four districts in Indonesia were selected as One Health pilot areas based on their high-risk for zoonotic diseases. A One Health Monitoring Tool was developed based on capacity building activities, which were implemented in the pilot districts to improve field officers' capacities to prevent, detect and respond to zoonotic disease events.

The method focused on group discussions with key stakeholders, key informant interviews with multi-sectoral field officers, questionnaires, field observation, and data collection on detected and reported disease events. Several workshops and training have been organized to strengthen the capacity and competencies of field staffs in One

Health sectors to reduce the risk of disease transmission. The program was followed by trainings organized to share knowledge on technical skills on joint investigation and information sharing to prevent the spread of emerging infectious diseases.

A performance matrix was designed based on the materials delivered to the field officers during the trainings. The matrix consisted of three sets of criteria: 1) communication, coordination, collaboration; 2) multi-sectoral disease response; and 3) sustainability, which were scored at five capacity levels. The results demonstrated communication, coordination and collaboration skills. More than 80 per cent of field officers in pilot areas integrated responses and 25 per cent of zoonoses cases have been addressed using the One Health approach. The necessity to implement joint risk assessment was highlighted for improving the assessment tool, which has however proved to be useful for policymakers to act strategically and target resources to increase the effectiveness of the One Health approach.



**Financing** is critical to ensure the implementation of adequate and impactful One Health initiatives. Zoonotic diseases lead to millions of deaths annually and a single outbreak can incur direct and indirect losses in the tens of billions of dollars (Kelly et al., 2020). The impacts of SARS, H5N1, and H1N1 resulted in global economic losses in the range of US\$105 - US\$135 billion (World Bank, 2018). Additionally, due to lockdowns and the disruption of global economic activity, GDP in Central Asia, South Asia, Southeast Asia, and the Pacific declined by 1.9, 5.5, 4.0, and 5.8 percent respectively in 2020 (ADB, 2021). However, preventing the emergence of diseases globally would only entail an estimated 2% of the total damage incurred in responding to the COVID-19 pandemic, as of July 2020 (Dobson and Al, 2020).

**Cooperation among countries** is critical to continue develop and implement One Health approaches. Currently, there is emerging consensus that One Health principles remain insufficiently integrated in existing multilateral treaties and global institutions (Ruckert et al., 2021), therefore preventing efficient international cooperation. Fostering international cooperation is helpful in maintaining a continuous flow of information, strengthening ties of cooperation and support among specialists, and creating a space for discussion and consultation on topics of national and international interest. To allow for greater cooperation, the Tripartite advocates for effective multisectoral, multidisciplinary, and transnational collaboration at the local, national, regional and global levels. It updated and expanded its 2008 Guide to cover prevention, preparedness, detection and response to zoonotic threats at the animal-human-environment interface in all countries and regions. (FAO, OIE, WHO, 2019).



# V. Recommendations

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## **Focus on regional cooperation to better implement One Health principles.**

Providing a framework for collaborative and coordinated action to mainstream the One Health approach at different levels of operation, including regional, national and community levels is key to work towards the achievement of One Health principles. Promoting learning and exchange of information within and across countries, sectors disciplines and groups of society can help generate effective knowledge and solutions to existing health issues. As emphasized by the One Health Joint Plan of Action (2022-2026), achieving One Health is a shared responsibility and it relies on the crucial role of cooperation among countries, regional organizations, and other international organizations and stakeholders in supporting countries' efforts to effectively address persistent health threats. For instance, reinforcing regional initiatives and programmes to influence and support One Health responses to AMR through strengthened regional collaboration is a priority outlined by the One Health Joint Plan of Action (2022-2026).

## **Strengthen the environmental dimension of One Health to prevent disease emergence.**

The climate, biodiversity and pollution crises have clear negative health impacts to humans, animals, and the environment. To mitigate and reverse negative health impacts stemming from these crises, ambitious and coordinated action is needed by governments,

the private sector, and individuals by transforming key systems in energy, water and food for sustainable land and ocean use. Transforming these key systems will help in protecting biodiversity and critical ecosystem services necessary to protect the health of all living things at the human-animal-environment interface. In strengthening this environmental dimension of One Health, governments in the region should become more engaged with the One Health WHO-OIE-FAO tripartite, in particular the One Health High Level Expert Panel (OHHLEP) which will provide “policy relevant scientific assessment on the emergence of health crises arising from the human-animal-ecosystem interface” (Morand & Lajaunie, 2021). Additionally, to help initiate the necessary transformations, undertaking collaborative work on regional and sub-regional environment sector needs assessments and on environment sector capacity development implementation plans can help further integrate the environment in One Health (WHO, OIE, FAO, UNEP, 2022).

## **Raise political support for One Health initiatives.**

It is imperative to provide political support for utilizing integrated approaches, developing or revising policies to incorporate sectors that can contribute to health challenges, establishing multi-sector and inter-ministerial coordination mechanisms or frameworks, and providing communication guidance across sectors. Raising the political prioritization of One Health initiatives can be supported by the

development of relevant case studies and best practices to better inform decision-making. Governments should also strengthen the policy-science interface as well as enhance public awareness of One Health approaches and its benefits to sustain One Health relevance and prioritization in the political agenda and links with the sustainable development agenda.

**Increase adequate funding.** It is critical to invest in One Health approaches to mitigate risks of future pandemics in addition to their associated human and economic costs. Conducting economic analysis for One Health investments at regional, national, and local level can help define financial and investment needs. Sustainable investment frameworks would help strengthen health systems, improve animal and human disease surveillance, and enhance emergency preparedness. For instance, improving cost-benefit analyses of emerging diseases prevention to include the cost of social impacts of diseases can optimize investments and reduce trade-offs. Further, coordinated, early and targeted investments are critical elements for collaborative programming and to further engage environment and wildlife sectors in One Health. According to the World Bank's January 2021 economic forecast, the cost of prevention of pandemics represents less than 1 percent of the costs of current pandemic (Van Nieuwkoop and Eloit, 2021). Strengthening systems and coordination across the human health, animal health and environment sectors can provide a strong return on investment by avoiding duplication of activities and enhancing synergies (FAO, OIE, WHO, 2019). Investments in laboratory

and operational capacities will also be beneficial for surveillance in addition to mechanisms to assure a legal basis for joint surveillance activities among different countries in the region. In addition, the One Health High-Level Expert Panel identified key investment strategies in One Health that could support adequate, timely and targeted investments: research; coordination among research funders; platforms for information sharing; the lack of funding for endemic zoonoses by One Health funders at the expense of the emergent and new zoonoses (FAO, OIE, WHO, UNEP, 2021).

**Develop cross-regional educational and training programmes.** Training in interdisciplinary approaches at all levels will enhance collaboration of stakeholders from different disciplines which will allow them to capture the complex drivers and consequences of health issues such as zoonosis, AMR, and food security and safety. Training in leadership, health diplomacy, and communication can also be crucial for current and prospective practitioners in advocating and communicating the importance of adopting One Health approaches to policymakers. Improving engagement with other disciplines, sectors and countries to share best practices will also be key in providing up-to-date knowledge to identify and fill knowledge gaps which can enable better decision making in implementing effective and cost-efficient integrated actions. Additionally, receiving training in different topics such as epidemiology, agronomy, environmental sciences, and social sciences (e.g., sociology, anthropology, economics) can assist in breaking silos that hinder collaborative research across disciplines.

## **BOX 4: SOUTHEAST ASIA ONE HEALTH UNIVERSITY NETWORK**

The Southeast Asia One Health University Network (SEAOHUN), established in 2011 with support from the United States Agency for International Aid (USAID), aims to develop a resilient and competent One Health workforce through education, research, and training provided by university networks in Southeast Asia. As of this year (2021), SEAOHUN consists of 92 universities in eight ASEAN countries (Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam). The network of universities collaborates together to improve their workforce capacity with cross-sectoral competencies and multiple disciplines to effectively prevent, detect and respond to infectious disease threats.

Examining the accomplishments of the Vietnam One Health University Network (VOHUN), this network has connected twenty Vietnamese universities from various fields such as medicine, veterinary science, public health, nursing, and food technology to promote One Health approaches (SEAOHUN, 2021). Through training and research, this network has equipped the next generation of researchers and practitioners with a full range of knowledge and skills needed to effectively implement One Health approaches. SEAOHUN and its sub-networks are good examples of how programmes emphasizing the need for multi-sectoral and multi-disciplinary training in breaking silos and promoting regional collaboration can assist in developing a workforce to address the multifaceted health issues the region faces.

### **Improve One Health surveillance.**

Developing operational tools and resources to conduct targeted One Health surveillance for multisectoral data sharing as per the Tripartite/UNEP/OHHLEP guidance can be of particular relevance. The systematic collection, validation, analysis and interpretation of One Health data is very important because it can inform decision-making for more effective and evidenced-based interventions. Integration and sharing of surveillance data should be strengthened

not only at the local and national level but also at the regional and global level—as this can not only enhance detection and action towards One Health issues but also promote better collaboration, communication, and coordination between stakeholders. Additionally, strengthening regional, national and local surveillance systems, early warning, control and risk management practices and response systems are key to safeguard environmental and human health.

## **BOX 5: ONE HEALTH SURVEILLANCE IN INDONESIA**

Indonesia, with its abundance of biodiversity, is one of the seventeen “megadiverse” countries in the world. However, high rates of deforestation, wildlife trade and hunting networks, and a growing population threaten the country’s biodiversity—increasing the risk of zoonotic disease emergence and transmission. To address this issue, the central government (Ministry of Agriculture; Ministry of Environment and Forestry; Ministry of Health; Ministry of Research, Technology and Higher Education) in collaboration with the FAO, WHO, and local universities and hospitals have been a part of the PREDICT project funded by USAID since 2009. The PREDICT project is a part of USAID’s Emerging Pandemic Threats (EPT) programmes which aims to safeguard the world from emerging pandemic threats using the One Health approach by training a workforce that is better prepared and empowered to prevent pandemics. In Indonesia, the project works to better understand the mechanisms of virus spillover from wildlife to livestock and people and to strengthen capabilities for the detection of priority zoonotic diseases and other high-risk viruses at the human-animal interface.

The project has developed Indonesia’s One Health workforce by training over 130 people in core skills needed for zoonotic disease surveillance and detection in addition to strengthening two laboratories essential for supporting and improving capabilities in surveillance, detection, and bioinformatics analysis. Over 300 individuals were interviewed to better understand the social and behavioral factors associated with exposure to zoonotic diseases. The FAO and the Ministry of Agriculture also trained eight National Veterinary Disease Investigation Centers to detect new and emerging viruses in domestic animals. Additionally, safe behaviors and practices for risk reduction were promoted in communities at-risk for exposure to zoonotic diseases. With the support of the central government, development agencies, multilateral organizations, and local organizations, Indonesia was able to strengthen their surveillance capacities to dealing with zoonotic diseases. (Convention on Biological Diversity, n.d.; USAID, 2020)

**Improve monitoring and evaluation.** A standardized framework for systematic evaluation and reporting of One Health outcomes is necessary to generate reliable evidence on the benefits and effectiveness of One Health initiatives. A network of community experts in the One Health field and its related disciplines is also needed to develop science-based evaluation

protocols to address the lack of metrics and associated methods to estimate One Health benefits in a systematic way. Going forward, ensuring the harmonization of application of One Health principles by implementing practical measures to strengthen regional, national, and local policy frameworks for the control and prevention of zoonotic diseases will be of particular relevance.

## **BOX 6: CROWDSOURCING TO REPORT AND RESPOND TO ZONOTIC DISEASES IN THAILAND**

Farmers, local health volunteers, as well as health professionals in Thailand are using mobile devices to directly report detections of zoonotic diseases that may pose a serious health threat. Abnormal illnesses and even deaths are reported to the Ministry of Public Health through a smartphone application called FARMER. The early reporting of illnesses and deaths allows for faster disease investigations.

A team of One Health experts is in charge of monitoring the data received and can initiate rapid response to control potential outbreaks. Additionally, the application allows provinces to receive logistical support from the Ministry of Public Health when needed. The application results are compiled and stored into a database hosted by the Bureau of Epidemiology, allowing Thai authorities to better manage disease information (CDC, 2018).

**Enable effective collaboration at all levels and inclusion of under-represented stakeholders.** Effectively addressing the issues at the animal-human-environment interface requires effective partnerships and collaborations at all levels. Natural resources such as freshwater, migration of species, and disease outbreaks do not respect borders. Therefore, it is important for countries in the Asia-Pacific region to collaborate to achieve optimal health outcomes for human, animals, and plants in our shared environment. Ministries could establish coordination mechanisms such as regional multi-disciplinary and

multi-sectoral One Health task forces, technical committees, working groups, and appoint Focal Points for specific activities to strengthen One Health initiatives. Additionally, the inclusion of all stakeholders including rural communities, as well as indigenous peoples residing within natural areas is fundamental to implementing the One Health as they are both users and components of the complex matrix of interactions which maintain functionality of the natural world (Mazet et al., 2014) and are key to mitigating public health and agricultural biodiversity threats while fostering environmental stewardship.

# VI. Conclusion

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More must be done to effectively implement and improve One Health initiatives in Asia and the Pacific. Whilst it has demonstrated effectiveness in addressing issues such as zoonoses, AMR, and food safety, more must be done to strengthen the overall environmental dimension in One Health approaches, including protecting biodiversity and ecosystems services, promoting more sustainable food systems as well as combatting illegal wildlife trade, climate action and pollution.

Challenges in implementation also remain to upscale and expand initiatives on One Health, including on raising political support, financing, capacity building, surveillance, monitoring, and evaluation. Further, in order to reduce the emerging and growing health threats we face today and into the future, stakeholders at all levels, sectors, and disciplines must work together to address the multitude of issues and their drivers that place health risks at the human-animal-environment interface.

Lastly, successful application of One Health approaches can play a strong role in supporting the implementation of the 2030 Agenda due to its multisectoral, multidisciplinary, and collaborative nature.

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