Incorporating Environmental Considerations into the Animal Health Sector

Policy Brief

Executive Summary

The degradation of our environment poses significant risk to animal health but is rarely considered in national policies and training for Veterinary Services. There are developments that provide insights and lessons learned, such as the adoption of environmental policies that encourage farmers to implement agricultural solutions to restore wildlife habitats [1]. Nevertheless, land-use changes, habitat loss, misuse of antimicrobials and environmental contamination increase disease transmission and threaten animal health. Climate change disrupts ecosystems and impacts biodiversity, affecting animal health directly and indirectly in different ways, including heat stress and the lack of water and food sources [2]. Therefore, the World Organisation for Animal Health (WOAH) advocates ecosystem protection and transformation for more sustainable production systems, and One Health capacity building of the animal health workforce, integrating an environmental perspective and increased multisectoral collaboration.

A healthy environment with functioning ecosystems is essential for the health of animals. The environment and animal health sectors must join forces on One Health issues through multisectoral partnerships and collaboration. Addressing climate change mitigation and adaptation strategies in livestock production is vital for protecting animal health and ensuring long-term sustainability. Integrating animal health into environmental and disaster risk reduction policies, as well as scaling up investments in prevention and preparedness, are essential steps to reduce the impacts of environmental degradation on animal health and ensure climate resilient and environmentally friendly animal health systems and services.

The Quadripartite Collaboration on One Health consisting of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) and WOAH developed the One Health Joint Plan of Action (2022–2026) to integrate systems and capacity to better tackle health threats collectively, with Action Track 6 focusing on including the environment in One Health.

In this policy brief, WOAH advocates policy alignment of Action Track 6 within the field of animal health and provides guidance on how to incorporate environmental considerations into the animal health sector.

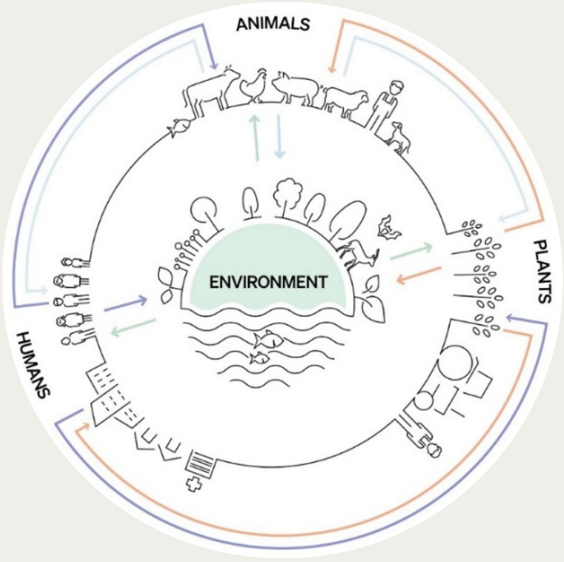

Figure 1: The One Health approach acknowledges that the health of animals, humans, plants and the environment is interdependent [3].

Insights from Scientific Evidence

About **26%** of ice-free land is used for livestock grazing, **33%** for livestock feed production and approximately **1.3 billion** people worldwide rely on the livestock sector for their livelihoods [4,5]. However, the livestock sector is responsible for **14.5%** of human-induced greenhouse gas emissions [6].

Habitat alteration and biodiversity loss affect the transmission of infectious diseases, resulting in increased prevalence of pathogens [7].

Only **1%** of pesticides are effectively used to control pests, leaving large amounts to contaminate the environment, resulting in negative health consequences for animals such as insects, birds and aquatic animals [8].

Excessive use of fertiliser results in environmental degradation, such as the acidification of soil and groundwater, providing health hazards for humans and animals [9].

Climate change and population growth are major stressors for livestock farming and natural habitats, threatening global food security and biodiversity [11].

Run-off from agricultural plant and livestock production are main contributors to the spread and development of antimicrobial resistance (AMR) [10].

Rationale for Action – Environmental Threats and their Impact on Animal Health

Anthropogenic activities

A healthy environment with functioning ecosystems is essential for animal health and welfare. Any deterioration of the environment has direct or indirect negative impacts on animal health (wild and domestic) and human health. To date, approximately 75% of the earth's terrestrial surface area has been drastically altered by human activity [14]. Of the earth's altered surface, about 26% is used for livestock grazing and 33% for livestock feed production [4]. **Environmental stressors of anthropogenic origin** promote the emergence of zoonotic and vector-borne diseases and food safety issues. The impact of human **activities** in the environment can additionally cause a range of other issues (e.g. land degradation and biodiversity loss) that are of specific concern for animal producers, Veterinary Services professionals and wildlife conservationists [12]. Diseases can also be transmitted from humans to domestic or wild animals, which is of particular concern because animals have the potential to intensify the spread of disease [17].

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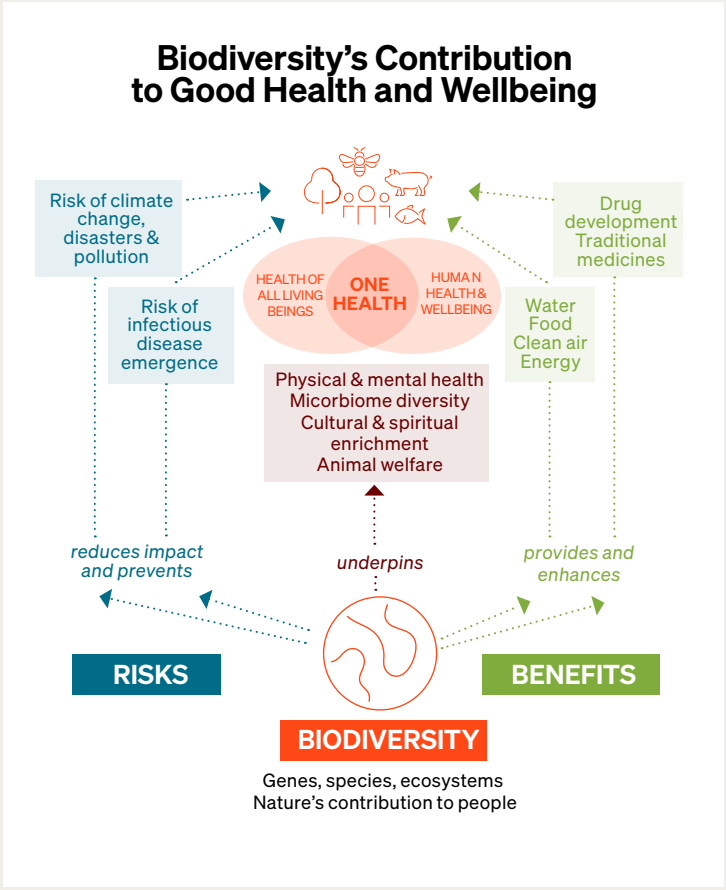
Main drivers for **land-use change** are unsustainable agriculture expansion, including intensification of livestock production and deforestation, and urbanisation [15]. Land-use change causes habitat loss and fragmentation for multiple species and interaction of humans and domestic animals with wildlife, increasing the risk of transmission of zoonotic diseases and transboundary animal diseases. Hence, land-use changes directly impact reservoir dynamics and disease emergence and count as a major contributor to **biodiversity loss** worldwide. This is especially apparent in forested tropical regions with high wildlife biodiversity [16]. Integrating biodiversity considerations into the One Health approach will help us to understand the multifaceted and complex links to disease pathways as well as animal and human health (see Figure 2) and therefore correct these negative impacts.



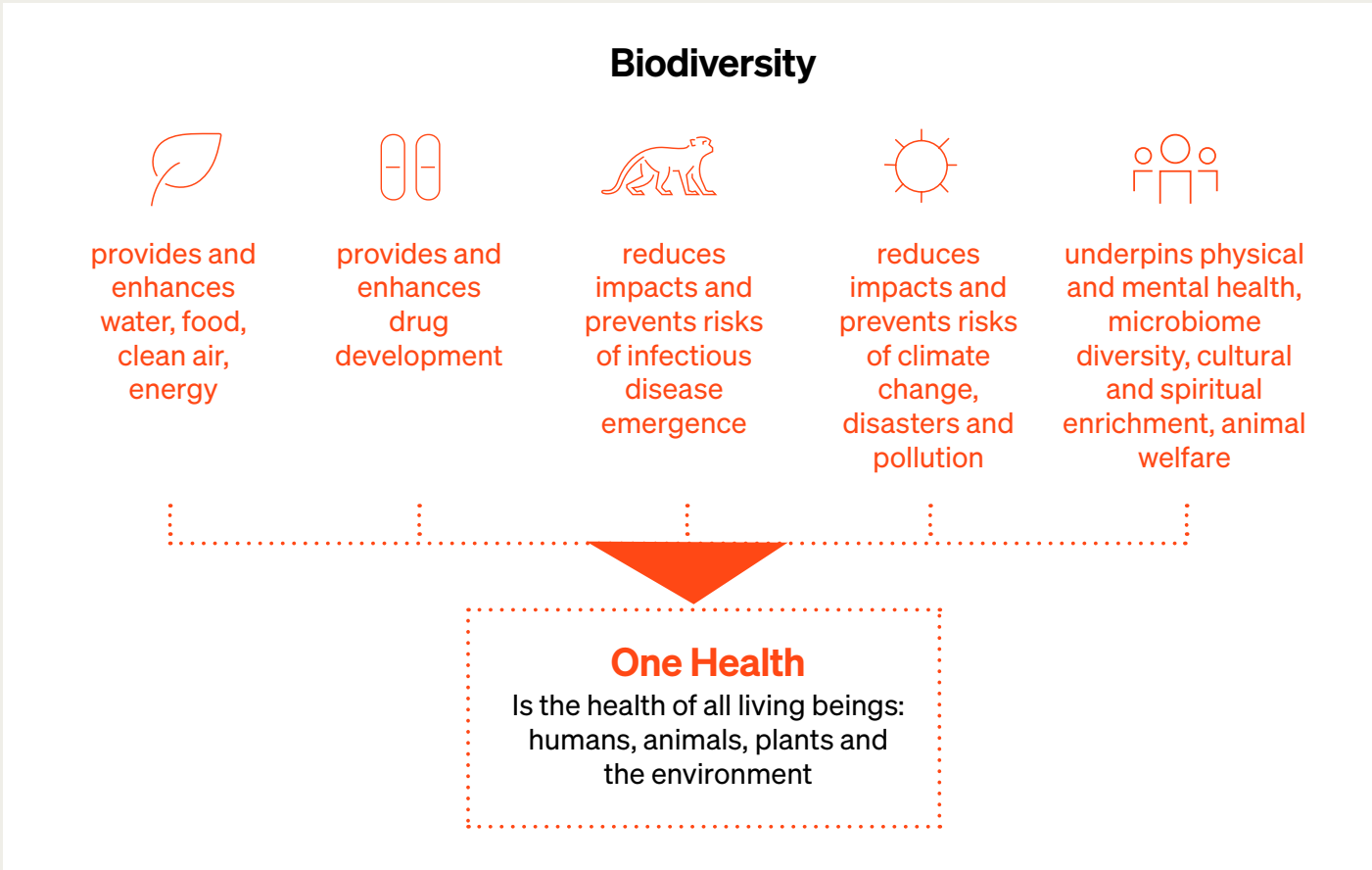


Figure 2: Contributions of biodiversity to One Health, adapted from Convention on Biological Diversity [18].

Agriculture practices

Livestock provide a significant contribution to sustainable development through their role in food security, nutrition, poverty alleviation, ecosystems services and economic growth, as they support more than 750 million of the world's poorest population. Therefore, the environmental impacts of **feed and livestock production** should be reduced through improved livestock systems management, ensuring more efficient use of resources, as the livestock sector's greenhouse gas emissions are responsible for at least 14% of human-induced greenhouse gases [6].

Environmental contamination due to agricultural practices (e.g. the use of pesticides, herbicides, fertilisers and antimicrobials) can alter habitats, causing toxins to accumulate in nature. The contaminants affect the quality of soil, water and air, acting as a driver for climate change and posing a health risk to animals and humans [8]. Therefore, good practices for managing risks in animal production systems should be encouraged, and the shift to alternative models of livestock production that apply ecological concepts and principles should be promoted [13].

Antimicrobial resistance

The **misuse of antimicrobials** in food-producing and companion animals contributes to the emergence of AMR. In livestock and aquatic animal production systems, antimicrobials added to animal fodder can spread through faeces and urine; thus, residues accumulate in wastewater, agricultural runoff and fields. Resistant microbes can disperse through environmental pathways, such as water and soil, posing a significant threat to animal and human health [19]. Therefore, decreasing antimicrobial use without endangering the food supply should be encouraged.

Climate change

In all the above, **climate change is an overarching threat** that exacerbates environmental problems and has wide-ranging implications for animal health. Livestock production systems are particularly threatened by changes in seasonal weather patterns (e.g. changing temperatures and extreme weather events) that can result in unavailability of water and feed sources. Climate change-induced alterations in ecosystems, extreme weather events and natural disasters have multiple consequences such as biodiversity loss, increase in prevalence of infectious diseases and disease vectors, water scarcity, the migration of animal populations to new areas, and alteration of immune status because of stress [11]. Aquatic animals also experience negative consequences due to climate change through alterations in the physical and chemical composition of the water, pollution and other factors [20]. Disruptions in animal production systems can lead to major economic losses and food insecurity; these impacts disproportionately affect the most vulnerable individuals, such as small-scale livestock farmers, women and children [12].

Connecting the environment and animal health sectors is crucial to reduce the risk of zoonotic and vector-borne disease outbreaks, prevent the spread of AMR, mitigate and adapt to climate change in the livestock sector, and ensure sustainable practices that protect the health of animals and the environment. Figure 3 illustrates how the One Health approach can help to tackle climate change.

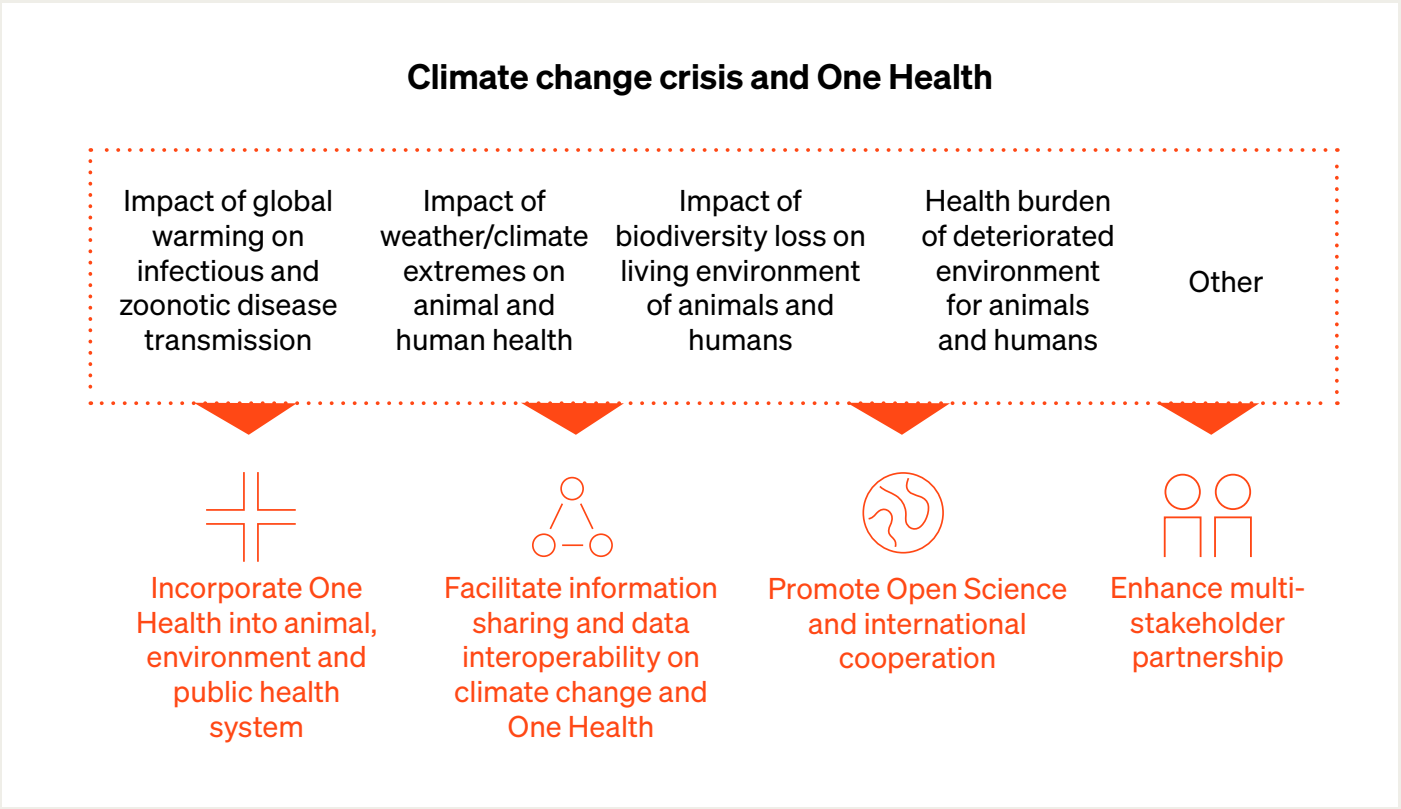


Figure 3: The One Health approach to tackling climate change, adapted from Zhang *et al.* [21]

WOAH's work in Incorporating the Environment into the Animal Health Sector

1. Protect, restore and prevent the degradation of ecosystems and environment

The added benefits of preserving animal and human health through protecting and restoring biodiversity and ecosystems are essential. Following the One Health approach, an improved understanding of health concerns posed by environmental degradation to wildlife, domestic animals and humans should be promoted in all relevant sectors.

WOAH makes a substantial contribution to detecting, managing and reducing the risk of AMR, zoonoses and other animal illnesses by creating international standards, guidelines and recommendations for animal health and veterinary authorities. For instance, WOAH helps countries to reduce and optimise the use of antimicrobials. A recent report highlighted that the global use of antimicrobials decreased by 13% between 2017 and 2019, which is a significant contribution to preventing the spread of AMR through the environment and preserving the efficacy of critical medicines [22]. Through the Wildlife Health Framework, WOAH strengthens Members' capacity to manage the risk of disease emergence and implement mitigation measures while protecting wildlife health. Wildlife is a crucial component of the environment, as a healthy wildlife population contributes to biodiversity and provides a balanced ecosystem [23].

To reduce the contribution of livestock and aquaculture production to environmental pollution and climate change, the use of sustainable and climate-smart methods should be further encouraged while ensuring high standards and quality for the health and welfare of the animals.

Initiatives need to be linked to **Nationally Determined Contributions** (NDCs), **National Biodiversity Strategies and Action Plans** (NBSAPs) and other commitments under **multilateral environmental agreements** (MEAs) and a **Health National Adaptation Plan** (H-NAP) made by national governments to address climate change and environmental degradation.

- To promote and scale up One Health implementation, **the Quadripartite One Health Joint Plan of Action** includes Action Track 6 that focuses on sustainable practices and environmental conservation to address climate change, reduce pollution, protect ecosystems and ensure the sustainable use of natural resources.
- WOAH, UNEP and other partners reduce zoonotic diseases by strengthening the environment sector within a One Health approach through the Nature for Health initiative.
- WOAH, WHO and FAO have developed the **Multisectoral Coordination Mechanism Operational Tool** (MCM OT) to support national authorities in establishing or strengthening their coordination in order to manage zoonotic diseases and other One Health threats [24].
- WOAH and FAO created the **Global Framework for the Progressive Control of Transboundary Animal Diseases** (GF-TADs). The GF-TADs offers capacity training and creates programmes for the targeted management of transboundary animal diseases by establishing regional partnerships.
- WOAH is involved in multi-stakeholder consultations for the Global Agenda for Sustainable Livestock (GASL) to discuss climate action for sustainable livestock-based food systems.

Country examples

One Health Bangladesh platform

The One Health Bangladesh platform was established in 2008, and subsequently a One Health National Strategic Framework was developed, gaining political commitment from the Ministry of Health and Family Welfare, Ministry of Fisheries & Livestock and Ministry of Environment & Forestry. This has enabled cross-sector partnerships that, among other issues, focus on environmental challenges such as land use, climate change and pollution [24,25].

United Kingdom's environmental land management scheme

The United Kingdom has adopted an environmental land management scheme that encourages farmers to implement agricultural solutions to restore wildlife habitats, improve water quality and limit emissions [1].

2. Develop One Health integrated surveillance for data and evidence

An essential component of the One Health approach is integrated surveillance that combines data from animal, human and environment sectors to inform risk management and risk communication. With the growing risk of zoonotic disease emergence caused by environmental degradation, timely and accurate reporting of animal health data is crucial for sustainably managing disease threats [25]. WOAH supports its Members in achieving this through several projects and surveillance tools aiming at risk reduction:

- The **World Animal Health Information System** (WAHIS) and WAHIS-Wild Beta present data reported by national authorities and facilitate access to information on disease outbreaks.
- WOAH collects data on antimicrobial use in animals in the open access **ANIMUSE** database to combat environmental pollution with antimicrobials.
- WOAH, FAO and WHO inform prevention and control measures through the **Global Early Warning System** (GLEWS+) for health threats at the human–animal–ecosystems interface [26].
- The **PROVNA project** supports countries in predicting the spread of vector-borne diseases, including environmental and climate data.
- The WOAH **Wildlife Health Framework** aims to strengthen the ability of Veterinary Services to prevent biodiversity loss through the early detection of diseases in wildlife.
- WOAH's **EBO-SURSY project** strives to improve local, national and international early detection systems for zoonotic diseases in ten countries in West and Central Africa, with plans to expand to other countries in the region.
- WOAH, FAO and WHO developed a **Tripartite Zoonoses Guide** to enhance cross-sector collaboration and prevent zoonotic disease risks, including an operational tool for joint risk assessment [27].

3. Build One Health capacities and improve environmental knowledge of the animal health workforce

The animal health workforce works directly with livestock and aquatic animal producers and has a unique role in communicating and promoting the One Health approach. By integrating environmental considerations (including biosecurity and waste management) into their practices, the animal health workforce can contribute to safer and more sustainable livestock production, mitigate environmental degradation and reduce pollution risks. To facilitate a thorough understanding of the environment, engaging and consulting with Indigenous Peoples and local communities will provide a comprehensive perspective [28]. Through collaboration with cross-sector stakeholders and the implementation of holistic strategies, the animal health workforce can advocate environmentally responsible and improved practices that prioritise the health of animals, humans and their shared ecosystem. WOAH offers different tools aimed at enhancing One Health capacities. These include training for veterinarians and veterinary paraprofessionals and soon for Community Animal Health Workers (CAHWs), who are instrumental in many countries. This is done through the **Performance of Veterinary Services Pathway** (PVS), as well as an interactive **training platform** to strengthen Veterinary Service competencies and ensure adequate understanding and implementation of standards and guidelines. WOAH, WHO and FAO, with plans to engage UNEP to strengthen the environmental perspective, conduct **National Bridging Workshops** to foster One Health capacity building and planning at national level, by creating synergies between the animal health and human health and environment sectors.

Policy Recommendations

WOAH recommends the following policy-based solutions to strengthen the linkage of environment and animal health sectors under the One Health approach:

At policy and institutional level:

- Strengthen intersectoral cooperation and multi-level governance to include the environment in addition to human and animal health.
- Establish institutional engagement for the transformation of production systems, including agroecology and sustainable fish and livestock farming.
- Include animal health in Nationally Determined Contributions and other climate commitments, such as halting biodiversity loss and restoring nature.
- Integrate animal health into environment, biodiversity, climate change and disaster risk reduction plans and policies.
- Scale up financial investments for climate mitigation and adaptation and biodiversity restoration to prevent and prepare for epidemics and pandemics.
- Develop incentives for individual behaviour change to implement mitigation and adaptation measures for health threats at the human–animal–environment interface.
- Integrate the knowledge and considerations of Indigenous Peoples and local communities in policies and strategic plans.

At programmatic level:

- Establish a One Health Multisectoral Coordination Mechanism (OH MCM) with environment and animal sectors on a par with the public health sector.
- Through the OH MCM, ensure that budget allocation is equitably shared among all sectors for adequate implementation of One Health activities.
- Promote climate-resilient and sustainable animal health infrastructure and technologies.
- Strengthen community awareness and engagement in relation to the One Health approach.

At technical level:

- Develop tools and techniques for animal (including wildlife) disease surveillance that consider environmental variables (e.g. weather patterns, temperature, air quality, soil composition).
- Develop capacities of the veterinary healthcare workforce and its educational institutions to build and sustain climate- and disaster-resilient health systems.
- Develop and promote opportunities to strengthen the animal food system within environmental and biodiversity limits, including agroecology and sustainable fish and livestock farming.
- Enhance collaboration in research and development between the environment and animal health sectors.
- Establish collaborations with Indigenous Peoples and local communities in relation to designing and implementing One Health activities.

WOAH sources for further information

One Health
WOAH International Standards
WOAH Training Portal
World Animal Health Information System (WAHIS and WAHIS Wild)
Performance of Veterinary Services (PVS) Pathway
PROVNA project: Prototyping on EO-based Vector-borne Disease Surveillance System for North Africa
EBO-SURSY Project: Capacity building and surveillance of Ebola virus disease
GF-TADs: Global Framework for the Progressive Control of Transboundary Animal Diseases
WOAH Wildlife Health Framework
WOAH and the Global Agenda for Sustainable Livestock (GASL)
Tripartite Guide to Addressing Zoonotic Diseases in Countries
GLEWS+: Global Early Warning and Response System
Nature 4 Health Initiative

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Contact:
Dr Chadia Wannous
One Health Senior Specialist and Global Coordinator
E-mail: c.wannous@woah.org

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