Bangladesh One Health Strategic Framework

2025-2030

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Government of the People's Republic of Bangladesh

Preface

One Health started its journey in Bangladesh in 2008 when a group of visionary professionals formed 'One Health Bangladesh' as a civil society forum for promoting one health and protecting the health of humans, animals and environment which are intrinsically interconnected.

Now One Health has been institutionalized within the government and multi sectoral coordination platforms such as One Health Secretariat that has been established to coordinate among Ministry of Health and Family Welfare (MoHFW), Ministry of Fisheries and Livestock (MoFL) and Ministry of Environment, Forestry and Climate Change (MoEFCC). One Health has a potential to develop to its full form spanning human, animal, plant and ecosystem involving whole-of-government and whole-of-society. The definition of One Health is also evolving.

The Government of Bangladesh developed the first One Health strategy in 2012 after consulting with development partners, academic institutions, and civil society organizations. Later the strategy document was endorsed by MoHFW, MoFL and MoEFCC. The first strategy primarily focused on the control of infectious diseases through One Health approach. The second edition of the strategic framework was developed in a participatory manner in 2017 widening the scope of the Framework, for instance, addressing the issue of antimicrobial resistance (AMR). This was endorsed by the Inter-ministerial Steering Committee on One Health.

The current third edition has been developed after several consultative workshops drawing members from MoHFW, MoOFL, MoEFCC, Ministry of Agriculture (MOA), Ministry of Food (MoFood), development partners, academic institutions, research institutions and civil society organizations. The experience of COVID 19 pandemic, the new definition and evolving context of One Health, and the Quadripartite One Health Joint Plan of Action (JPA) have been reflected in the new revision of the strategic framework.

The contributions from all the participants enabled the development of this strategic framework and participants' hard work is thankfully acknowledged. The government also expresses its gratitude to the World Bank Group, Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), United States Agency for International Development (USAID), and One Health Bangladesh for their support.

This updated framework will be used to mainstream One Health in relevant ministries, sectors, departments, and non-government entities for successful achievement of Sustainable Development Goals in Bangladesh to make a discrimination-free country and society to make Bangladesh and the world safe from health threats.

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Abbreviations

ADB	Asian Development Bank
AHIF	Avian and Human Influenza Facility
AMC	Antimicrobial consumption
AMR	Antimicrobial resistance
AMU	Antimicrobial usage
APC	Air Pollution Control
APSED	Asia Pacific Strategy for Emerging Diseases
ASEAN	Association of Southeast Asian Nations
BARA	Bangladesh AMR Response Alliance
BARC	Bangladesh Agriculture Research Council
BCSIR	Bangladesh Council of Scientific and Industrial Research
BFD	Bangladesh Forest Department
BFSA	Bangladesh Food Safety Authority
BMDC	Bangladesh Medical & Dental Council
BSE	Bovine spongiform encephalopathy
BSTI	Bangladesh Medical & Dental Council
BVC	Bangladesh Veterinary Council
CEPA	Communication, Education, Participation, and Public Awareness
CEPI	Coalition for Epidemic Preparedness Innovations
CSO	Civil Society Organization
CVASU	Chittagong Veterinary and Animal Sciences University
CWG	Core Working Group
DAE	Department of Agriculture Extension
DGDA	Directorate General of Drug Administration
DGHS	Directorate General of Health Services
DGME	Directorate General of Medical Education
DLS	Department of Livestock Services
DMA	Dhaka Metropolitan Area
DNCRP	Directorate of National Consumers' Right Protection
DoE	Department of Environment
DoF	Department of Fisheries
DP	Development Partner
ECA	Ecologically critical area
EDRR	Eco-Disaster Risk Reduction
EMPHNET	Eastern Mediterranean Public Health Network
EnPI	Environmental Performance Index
EOCs	Emergency Operation Centres
ERT	Elephant Response Team
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign, Commonwealth and Development Office
FETPB	Field Epidemiology Training Program, Bangladesh
FETPV	Field Epidemiology Training Program for Veterinarians
FTP-WEBE	Field Training Programme for Wildlife, Environment, Biodiversity and

	Ecosystem
GMP	Good manufacturing practices
GoB	Government of Bangladesh
GRIIS	Global Register of Introduced and Invasive Species
HACCP	Hazard analysis and critical control points
HAI	Hospital Acquired Infection
HIES	Household Income and Expenditure Survey
H-NAP	Health National Adaptation Plan
HPAI	Highly pathogenic avian influenza
HWF	Health workforce
IAS	Alien Invasive Species
IEDCR	Institute of Epidemiology, Disease Control and Research
IHR	International Health Regulations
IMPCAPI	International Ministerial Conference on Avian and Pandemic Influenza
IPC	Infection prevention and control
IPM	Integrated Pest management
JEE	Joint External Evaluation Joint External Evaluation
JPA	Joint Plan of Action
LBM	Live Bird Markets
LDC	Least Developed Countries
LIMS	Laboratory information management system
MoA	Ministry of Agriculture
MoEFCC	Ministry of Environment, Forestry and Climate Change
MoFA	Ministry of Foreign Affairs
MoFL	Ministry of Fisheries and Livestock
MoFood	Ministry of Food
MoHFW	Ministry of Health and Family Welfare
MoU	Memorandum of understanding
MPTF	Multi-Partner Trust Fund
NAP	National Adaptation Plan
NAPHS	National Action Plan for Health Security
NBs	Nature-based solution
NGO	Non-governmental Organization
NSC	National Steering Committee
NTC	National Technical Committee
OECM	other effective area-based conservation measures
OHASA	One Health Alliance of South Asia
OHAT	One Health Assessment Tool
OHB	One Health Bangladesh
OHHLEP	One Health High Level Expert Panel
OHS	One Health Secretariat
OHSB	One Health Secretariat in Bangladesh
OHSF	One Health Strategic Framework
PDS	Participatory Disease Surveillance

PHERP-IH	Public Health Emergency Preparedness and Response Plan for Infectious Hazards
PVS	Performance of Veterinary Services
RRT	Reorganization of OH Rapid Response team
SAARC	South Asian Association for Regional Cooperation
SARS	Severe Acute Respiratory Syndrome
SBCC	Social and Behavior Change Communication
SPAR	State Party Self-Assessment Annual Report
ToC	Theory of Change
U2C	Upazila to Community
UHC	universal health coverage
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNSIC	United Nations System Influenza Coordination
USAID	United States Agency for International Development
VTRT	Village Tiger Response Team
WASA	Dhaka Water Supply and Sewerage Authority
WB	World Bank
WCCU	Wildlife Crime Control Unit
WHO	World Health Organization
WOAH	World Organization of Animal Health

Executive Summary

One Health originally emerged as a concept that recognizes the unity of purpose across public, animal, and environmental health fields to reduce zoonotic diseases and other significant health events. One Health started to get attention of the world community following the H5N1 avian influenza panzootic (animal pandemic) in poultry with a potential of human pandemic and then H1N1 influenza pandemic, finally after COVID-19 pandemic world leadership including international organizations fully recognized the need for one health for preventing the health events arising of animal, human and ecosystem interface. Alongside, the concept of One Health has also been evolving. In 2022, the One Health High Level Expert Panel (OHHLEP), an advisory group of the One Health Quadripartite Forum comprising Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP), World Health Organization (WHO), and World Organization of Animal Health (WOAH), adopted a new definition of One Health. According to OHHLEP, One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of humans, animals, plants and ecosystems. It recognizes the health of humans, domestic and wild animals, plants and the wider environment (including ecosystems) are closely linked and interdependent. 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.

In Bangladesh, following the incursion of highly pathogenic avian influenza in 2007, senior researchers and epidemiologists decided to initiate a civil society network on One Health. In 2008, that network evolved into 'One Health Bangladesh' (OHB) - a civil society platform involving physicians, terrestrial and aquatic animal health professionals, agriculturists, environmentalists, wildlife experts, ecologists, anthropologists, economists, allied scientists and civil society activists.

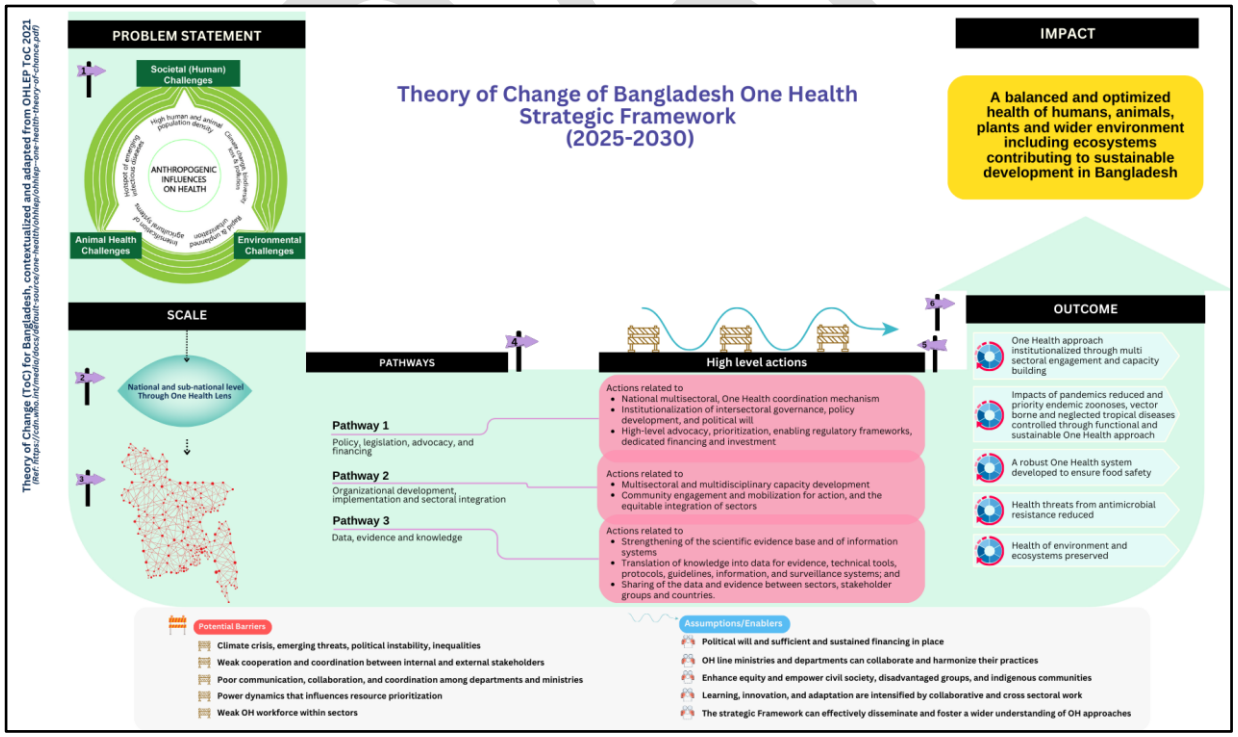
With the initiative of One Health Bangladesh and support from the UN organizations and development partners, Bangladesh developed Strategic Framework and Action Plan for a One Health Approach to Infectious Diseases in Bangladesh and later the Ministry of Fisheries and Livestock (MoFL), Ministry of Health and Family Welfare (MoHFW), and Ministry of Environment, Forest and Climate Change (MoEFCC) endorsed this One Health Strategy. . In 2016, following the guidance of National Strategic Framework, an Inter-Ministerial Steering Committee on One Health, an Inter-agency Technical Advisory Committee and a One Health Secretariat (OHS) were established. The rotational leadership of these oversight committees were also agreed upon. OHS started to function at IEDCR, selected to host the OHS with officers seconded from the Directorate General of Health Services (DGHS), Department of Livestock Services (DLS), and Bangladesh Forest Department (BFD). The One Health Strategic Framework and Action Plan was further revised in 2017 and scope was further widened. The strategy was renamed as Strategic Framework and Action Plan for the Application of a One Health Approach in Bangladesh (2017 – 2021).

Following the decision of the Inter-ministerial Steering Committee, the OHS initiated the process of developing the third edition of Bangladesh One Health Strategic Framework in 2023. This revision has taken into consideration the new definition of One Health and the One Health Joint Plan of Action (OH JPA) of the Quadripartite Forum. The OH JPA has been structured focusing on six action tracks including (1) One Health capacities to strengthen health systems, (2)

emerging and re-emerging zoonotic epidemics and pandemics, (3) emerging and re-emerging zoonotic epidemics and pandemics, (4) food safety, (5) antimicrobial resistance (AMR), and (6) health of environment. Moreover, the revision of the Strategic Framework relied on a critical analysis of One Health situation in Bangladesh through desk review and participatory workshops involving the representatives of different stakeholders.

The revised Bangladesh One Health Strategic Framework (OHSF) 2025-2030 recognizes that the anthropogenic influences on environment and planetary boundaries have a profound impact on the health and well-being of humans, animals, and the ecosystem we co-habit. Societal (human), animal and environmental challenges stem from inter-linked categories of human activities. Bangladesh is the worst victim of climate change, biodiversity loss and pollution. High population density, hotspot of emerging infectious diseases, intensification of agricultural systems, rapid and unplanned urbanization in Bangladesh further aggravated the burden of health problems.

The strategy relies on multisectoral coordinated action at national and subnational levels to achieve balanced and optimal health of humans, animals, plants and the wider environment including ecosystems contributing to sustainable development in Bangladesh. It aims to reduce the impact of pandemic, infectious diseases including zoonoses, AMR burden, ensure food safety and conserve environment and ecosystem health through a functional one health approach by improving governance and coordination, institutionalization of the mechanism, networking and advocacy, multisectoral capacity building for early warning, surveillance and response, and evidence-based information generation and sharing. The Theory of Change (ToC) of Bangladesh One Health Strategic Framework 2024-2030 is presented below:



The action packages organized under 11 components of OHSF will follow three pathways of changes, namely (a) Policy, legislation, advocacy, and financing, (b) Organizational development, implementation and sectoral integration, and (c) Data, evidence and knowledge, and will lead to five long-term or high level outcomes, eleven intermediate outcomes and the envisaged vision or impact. Bangladesh One Health Strategic Framework (2025 - 2030) has eleven components:

Component 1: Governance, financing, coordination, networking and partnership:

The component intends to institutionalize One Health approach by multisectoral engagement and capacity building. This will be achieved through sustained institutional arrangements for One Health governance and coordination and building a One Health community of practices. The activity plans to attain a functional one health governance with sustained financing, effective coordination, robust networking and strong partnership. For a functional one health governance the government will develop or update one health legal framework and expand one health governance mechanism to sub national levels. Additionally, the government will also further strengthen the One Health Secretariat.

Based on this One Health Strategic Framework (OHSF) (2025-2030) a costed action plan for implementation of the Strategic Framework will be developed as a separate document. Following the endorsement of the third edition of Bangladesh OHSF (2025 -2030) by the core ministries (MoHFW, MoFL, MoEFCC), and formation of national and sub-national (division, district, upazila) One Health committees, the One Health Secretariat will serve as the main custodian for the implementation of the strategic framework ensuring participation of all the relevant stakeholders. The Government will ensure a sustained operational budget of the Secretariat and implementation of the strategic framework through coordinated resource planning and mobilization. The One Health Secretariat will also be responsible for monitoring and evaluation of the implementation of the strategic framework.

Component 2: Strategic Communication and Advocacy

This component focuses on enhancing One Health strategic communication and advocacy through a structured approach. Key outputs include the development of a comprehensive One Health Communication and Community Engagement Strategy, alongside capacity-building initiatives for stakeholders. Activities involve reviewing existing strategies, creating targeted communication materials, and implementing coordinated community engagement programs. Additionally, advocacy efforts will be strengthened by developing issue-specific advocacy packages, organizing policy dialogues, and sharing evidence-based success stories to influence policymakers and opinion leaders at various levels. Together, these actions aim to foster effective communication and advocacy for advancing One Health goals.

Component 3: Workforce Development

This component intends to address the critical need for building OH workforce across all relevant sectors. This will be achieved through mapping the need of OH workforce across the sectors and the development of a multisectoral OH workforce strategy to strengthen, expand, and mainstream OH workforce development programs such as Field Epidemiology Training Programs (FETPs) and other OH field training initiatives, as well as OH continuing education. The government will focus on integrating OH content into medical, veterinary, environmental sciences, and other curricula while supporting the establishment of OH diploma and postgraduate programs. The strategy will guide the effective deployment of OH professionals, establish clear career paths, and ensure optimal utilization of investments in workforce development, fostering a sustainable and skilled workforce to address cross-sectoral health challenges.

Component 4: Laboratory Capacity Building and Networking

This component aims to address the pressing need for resilient, well-equipped, and advanced laboratory capacity to support prompt diagnosis, early detection, and control of both pandemic and endemic diseases. Efforts will focus on capacity enhancement based on comprehensive assessments, supported by reliable funding and deployment of qualified personnel, to improve detection capabilities across sectors. The creation of laboratory referral systems and cross-sectoral laboratory networks with defined roles will facilitate efficient sample management and resource optimization. Emphasis will be placed on strengthening quality assurance through enhanced quality management systems, biosafety, biosecurity measures, and effective laboratory operations. Measures to retain proficient laboratory professionals will be incorporated to ensure sustainability and uphold excellence in laboratory services, forming a strong basis for advancing One Health initiatives.

Component 5: Transdisciplinary Research

This component focuses on transdisciplinary research to generate comprehensive data and actionable evidence. Currently, research efforts are fragmented across universities and research institutes, with limited collaboration and insufficient transdisciplinary studies. This component emphasizes developing a strategic plan to prioritize key OH research areas, such as pandemic preparedness, AMR, and ecosystem health, while mobilizing resources through engagement with national research bodies, universities, government agencies, private sectors, and development partners. Institutional collaboration will be enhanced through stakeholder consultations, international partnerships, and fellowships. To ensure impact, research findings will be disseminated through scientific seminars, bulletins, and advocacy meetings, translating them into evidence-based policies and interventions to address critical OH issues effectively.

Component 6: Pandemic Prevention, Preparedness and Response, and Control of Endemic Zoonoses, Vector Borne Diseases and Neglected Tropical Diseases

This component addresses the prevention, preparedness and response to pandemics and the control of endemic zoonosis, vector borne diseases and neglected tropical diseases. As most of the pandemics are of zoonotic origin, preventing zoonotic spillover at the human-animal-wildlife-environment interface is crucial. Action packages will address the root causes of zoonotic diseases like wildlife habitat encroachment, wildlife trade, and risky farming practices. This will include monitoring, inspection, and certification of farm, companion, and wild animal trade, reducing human-wildlife conflict, and implementing preemptive measures such as good farming practices with improved biosecurity, disease reporting, animal movement control, and

vaccination. Alongside prevention, strategic focus must also be placed on multisectoral preparedness to respond to potential pandemics.

The Quadripartite One Health Joint Plan of Action also highlights the control of endemic zoonoses, vector-borne diseases, and neglected tropical diseases. Bangladesh plans to revisit its list of priority zoonotic diseases of 2017, including both endemic and emerging diseases, as the context has evolved. Given the high burden of vector-borne and neglected tropical diseases, Bangladesh aims to reduce this burden by applying lessons learned from the successful elimination of diseases like visceral leishmaniasis (Kala-azar) and Lymphatic Filariasis.

Component 7: Coordinated Surveillance

This component intends to develop a functional One Health (OH) early warning system by leveraging both sectoral and integrated digital platforms for routine disease reporting, enhancing coordinated disease surveillance and advanced epidemiological analysis to mitigate the impact of pandemic and endemic diseases. This will be pursued by mapping existing surveillance capacities and identifying gaps in the public health and animal health sectors. The process will emphasize the integration of various surveillance methods, including routine passive surveillance, event-based active surveillance, community-driven participatory disease surveillance, and environmental monitoring. A key deliverable will be the creation of a robust data-sharing platform, seamlessly connected with the OH early warning system, to enable effective coordination, real-time information sharing, and cross-sectoral integration. These measures will aim to enhance early detection, reporting, and response capabilities for emerging health threats, reinforcing global health resilience.

Component 8: Coordinated Outbreak Investigation

This component intends to strengthen coordinated outbreak investigation and response mechanisms under the One Health (OH) approach. Joint investigations will be expanded to address spillover events and threats of newly emerged diseases (Disease X), guided by strategies, SOPs, and capacity building of OH Rapid Response Teams (RRTs) through training and simulations. An OH Lab and Epidemiology network will be established with operational guidelines, and a legal framework will be developed to support collaboration through updated legislation and resource allocation. These efforts aim to create a robust, unified approach for managing complex and emerging disease outbreaks effectively and sustainably.

Component 9: Food Safety

This component intends to develop a robust One Health (OH) system for food safety governance in Bangladesh, ensuring coordinated responses along the value chain, from farm to plate. Updated and harmonized legislation will form the foundation for these efforts. The OH approach will enable hazard identification, risk analysis, mitigation, and community engagement to promote safe practices. Guidelines for safe animal production, aquaculture, agriculture, and food manufacturing will be updated, supported by regulatory capacity building, compliance monitoring, and traceability systems. A coordinated food safety laboratory network will be established for hazard surveillance and analysis, along with systems for data sharing, emergency preparedness, and rapid response. These measures aim to strengthen food safety and protect public health through comprehensive OH coordination.

Component 10: Antimicrobial Resistance (AMR)

The strategic framework for antimicrobial resistance (AMR) containment highlights coordinated AMR and antimicrobial usage (AMU) surveillance and stewardship programs as key actions to promote the rational use of antimicrobials in both medical and veterinary practices. Improved infection prevention and control (IPC) measures in communities, healthcare facilities, and enhanced biosecurity in livestock farms are emphasized to minimize antimicrobial use and mitigate AMR. Community awareness and active engagement are identified as pivotal for sustainable AMR containment efforts. Additionally, reducing the environmental spillover of antimicrobials from hospitals, pharmaceuticals, and livestock farms is critical to prevent the spread of AMR in ecosystems. To achieve these goals, the Government of Bangladesh (GoB) is committed to institutionalizing and operationalizing the One Health (OH) approach, fostering cross-sectoral collaboration for effective AMR control. This comprehensive framework underscores a unified, multi-sector strategy to protect public health and the environment while ensuring the sustainable use of antimicrobials.

Component 11: Health of Environment and Ecosystem

The strategic framework for ecosystem vitality and health of the environment underscores the vital role of preserving ecosystems for the health of humans, animals, and wildlife. It focuses on protecting and restoring ecosystems at the human-domestic animal-wildlife interface by addressing degradation, deforestation, biodiversity loss, and unsustainable land-use changes. Ensuring access to clean water, energy, and air and mitigating climate change impacts on health are key priorities.

Key actions include expanding protected areas, restoring degraded ecosystems, managing forests and fisheries sustainably, and promoting equitable sharing of genetic and traditional resources. Efforts to reduce human-wildlife conflict, combat wildlife crime, and manage invasive species are enhanced. Pollution control and waste management are emphasized, alongside sustainable consumption practices.

The Government of Bangladesh (GoB) commits to implementing a climate-resilient One Health (OH) approach, integrating public, animal, and environmental health sectors. This includes incorporating the Health National Adaptation Plan (H-NAP) into the broader National Adaptation Plan (NAP) to optimize investments in a healthy environment and ecosystems, fostering resilience and well-being for all life forms.

Chapter 1

Introduction

1.1 HISTORY OF ONE HEALTH

The 19th-century German physician, naturalist, anthropologist, and politician Rudolf Virchow said, “Between animal and human medicine there is no dividing line—nor should there be”. Calvin Schwabe introduced the term “One Medicine” [1]. The constant threat of the emergence of zoonotic diseases in the animal–human interface demonstrated the need for intersectoral collaboration, especially in surveillance, risk management, biosafety, and communication and in this context One Health concept emerged [1].

In 2004, the Wildlife Conservation Society organized a symposium in New York, in which the Manhattan Principles were adopted that urged world leaders, civil society, the global health community, and scientific institutions to adopt a holistic approach to the prevention and combat of epidemic/epizootic diseases and the maintenance of ecosystem integrity. Soon, the principles became known as the One World, One Health concept (www.oneworldonehealth.org).

Following the decisions of International Ministerial Conference on Avian and Pandemic Influenza (IMPCAPI), held in New Delhi in December 2007, WHO, WOAH, FAO, the United Nations Children’s Fund (UNICEF), the World Bank, and the United Nations System Influenza Coordination (UNSIC) developed a framework to prevent, detect, control, manage, and eliminate diseases in the human–animal interface using One Health approach.

In 2010 FAO, WHO and WOAH formed a tripartite forum to promote One Health. In 2021, the tripartite forum was further extended to a quadripartite forum with the inclusion of the United Nations Environment Programme (UNEP).

1.2 THE CONCEPT OF ONE HEALTH

One Health is not a new concept and ancient literature and historical evidence demonstrate awareness about interconnectedness of human and animal diseases in ancient civilizations. The definition of One Health evolved over time [2]. At the early stage of One Health it was defined as an effort to collaborate across multiple disciplines on the local, national, and global level to achieve optimal health for people, animals, and the environment (Figure 1). In 2014, One Health Commission defined One Health as “the collaborative effort of multiple disciplines to obtain optimal health for people, animals, and our environment”.

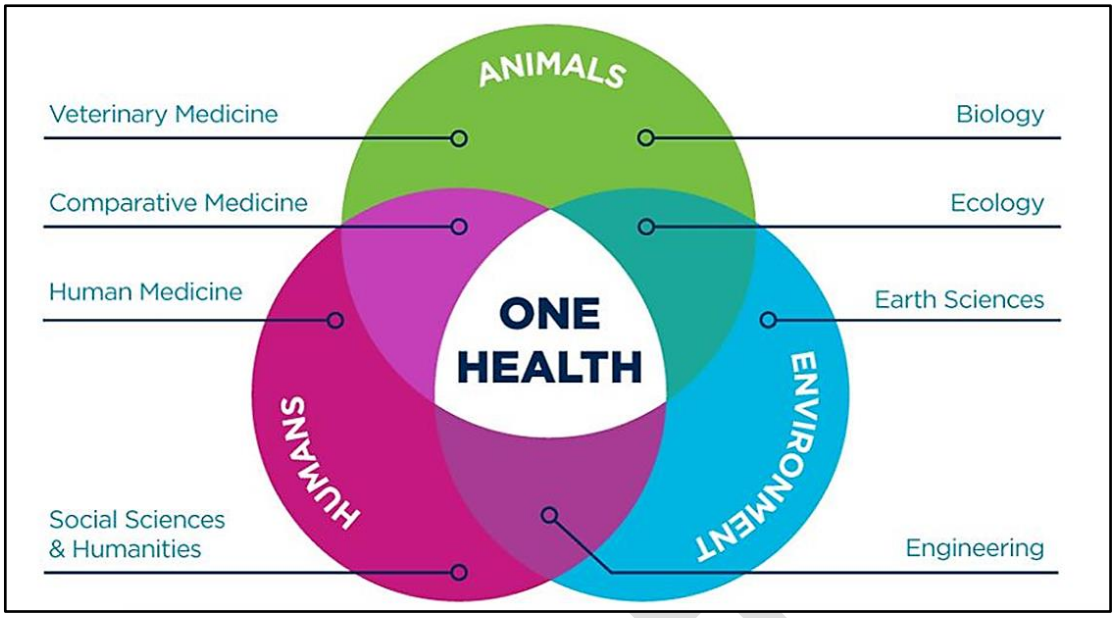


Figure 1: Diagram of one health concept (Source: FAO, EcoHealth Alliance)

In 2022, One Health High Level Expert Panel (OHHLEP) - an advisory group of the quadripartite forum (FAO, UNEP, WHO, WOAH), defined One Health as an integrated, unifying approach that aims to sustainably balance and optimize the health of humans, animals, plants and ecosystems. It recognizes the health of humans, domestic and wild animals, plants and the wider environment (including ecosystems) are closely linked and interdependent. 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 [3]. The scope of One Health following the OHHLEP definition is depicted in Figure 2.

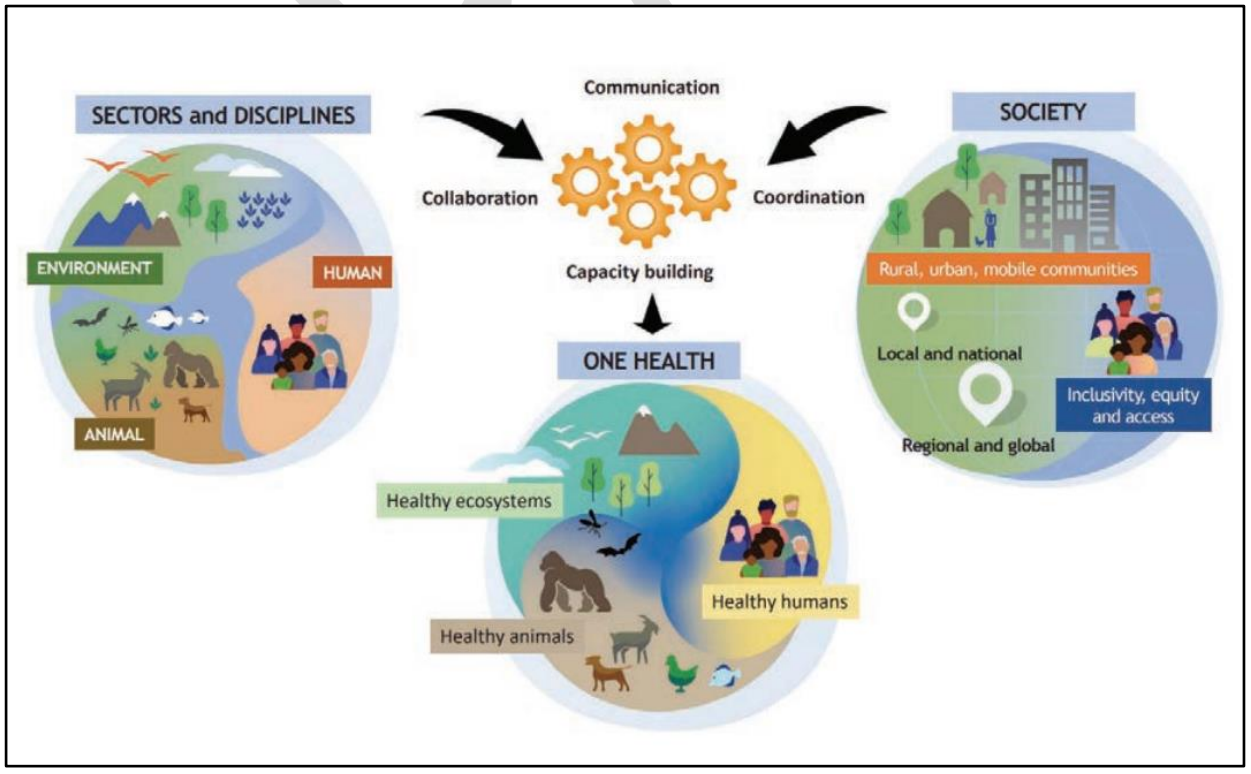


Figure 2: One Health promotes a sustainable and healthy future through collaboration, communication, coordination and capacity building (OHHLEP 2023)

Key underlying principles of One Health are

1. Equity between sectors and disciplines.
2. Sociopolitical and multicultural parity (the doctrine that all people are equal and deserve equal rights and opportunities) and inclusion and engagement of communities and marginalized voices;
3. Socio-ecological equilibrium that seeks a harmonious balance between human-animal-environment interaction and acknowledging the importance of biodiversity, access to sufficient natural space and resources, and the intrinsic value of all living things within the ecosystem;
4. Stewardship and the responsibility of humans to change behavior and adopt sustainable solutions that recognize the importance of animal welfare and the integrity of the whole ecosystem, thus securing the well-being of current and future generations; and
5. Transdisciplinary and multisectoral collaboration, which includes all relevant disciplines, both modern and traditional forms of knowledge and a broad, representative array of perspectives.

1.3 ONE HEALTH INITIATIVE IN BANGLADESH

1.3.1 One Health Initiative – as a civil society movement

The global panzootic (animal pandemic) avian influenza that started in South Asia in 2003 was the important driving factor in the development of One Health initiative in Bangladesh. In 2006 the public health, animal health and wildlife sectors came together to develop the Avian and Human Pandemic Influenza Preparedness and Response Plan. This was the first broadly inclusive One Health engagement process in Bangladesh that resulted in the first pandemic preparedness plan. In 2008, a group of visionary professionals from the human, animal and wildlife sectors formed One Health Bangladesh (OHB) - a civil society platform to promote One Health Concept in Bangladesh. Its membership was open to physicians, terrestrial and aquatic animal health professionals, agriculturists, environmentalists, wildlife experts, ecologists, anthropologists, economists, allied scientists and activists. Now One Health Bangladesh has around 1500 members and this community of practice supports government of Bangladesh and the society to practice One Health by organizing conferences, meetings, workshops and other promotional and knowledge sharing activities for reducing the risk of health threats posed by environmental degradation, intensive agriculture, population growth, unplanned urbanization, transboundary movements of humans, animals and plants, etc.

1.3.2 One Health Strategic Framework and Institutionalization of One Health Coordination

With the One Health Bangladesh initiative and technical assistance and support from the development partners Bangladesh drafted the Strategic Framework and Action Plan for a One Health Approach to Infectious Diseases in Bangladesh in 2012 [4]. Departments under MoHFW, MoFL, and MoEFCC, UN agencies, bilateral and multilateral development partners, civil society organizations, research institutions, and academic institutions were actively engaged in the development of this first One Health Strategic Framework. In 2015, MoFL, MoHFW, and MoEFCC officially endorsed the Strategic Framework and Action Plan.

Following guidance laid down in the Strategic Framework, the government initiated the process of institutionalization of One Health within the government. In 2016, a three-tier coordination mechanism was established which includes the Inter-Ministerial Steering Committee on One Health, Technical Advisory Committee and One Health Secretariat (OHS) coordination committee. The OHS was established at the Institute of Epidemiology, Disease Control and Research (IEDCR) within the MoHFW. The leadership of One Health coordination will rotate between the MoFWF, MoFL and MoEFCC. Three mid-level officers were seconded to OHS from

the Directorate General of Health Services (DGHS), Department of Livestock Services (DLS) and Bangladesh Forest Department (BFD). The key milestones of One Health journey in Bangladesh [6] are depicted in Figure 3.

Figure 3: Timeline of One Health Institutionalization in Bangladesh *[6]*

The One Health Strategic Framework and Action Plan was further revised in 2017 [5]. The title of the strategic framework was modified from "Strategic Framework and Action Plan for a One Health Approach to Infectious Diseases in Bangladesh, 2012" to "Strategic Framework and Action Plan for the Application of a One Health Approach in Bangladesh (2017 – 2021)" to widen the scope of the Framework. The process of developing the third edition of Bangladesh One Health Strategic Framework (2025-2030) commenced in October 2023.

1.4 ONE HEALTH IN SOUTH ASIA

In South Asia, some countries made significant progress in institutionalizing the One Health concept and mechanism for One Health governance. However, policies for managing endemic diseases in the region are largely ad hoc. A range of OH research and training programmes have been implemented in the South Asian region since the outbreak of zoonotic diseases with a pandemic potential in the early 2000s, such as Highly Pathogenic Avian Influenza (H5N1) (HPAI-H5N1) and Severe Acute Respiratory Syndrome (SARS) [7].

Following the outbreaks of HPAI H5N1, the WHO, FAO, and OIE established a tripartite relationship in the South Asian Association for Regional Cooperation (SAARC) and Association of Southeast Asian Nations (ASEAN) countries under the Asia Pacific Strategy for Emerging Diseases (APSED), funded by the European Union. The tripartite forum has facilitated intersectoral relationships and awareness of OH approaches through annual regional meetings on multisectoral collaboration for the prevention and control of zoonoses since 2010. However, effective functional regional collaboration to prevent, detect and respond to emerging health threats using One Health approach is lacking. Each of the three organizations individually contributes to strengthening OH in the region. The WHO South East Asian Regional Office is supporting the development of a regionally integrated rabies control programme. Changes to the WHO's International Health Regulations (IHR) are a driver for the human health sector to

report on zoonotic diseases. With EU and ADB support FAO established Regional Support Unit and Regional epidemiology and lead laboratories for controlling transboundary animal diseases including avian influenza. Unfortunately, with the end of project support from the partners these coordination mechanisms stopped functioning. Massey University implemented a regional OH capacity building programme to strengthen epidemiology and health risk management skills through integrated OH Master's education and applied epidemiology training, funded by the Avian and Human Influenza Facility (AHIF), administered by the World Bank from 2010 to 2013. Under the programme, an OH Hub was established in six countries, led by the two government institutions responsible for human and animal health, respectively, in each country, providing a networking and communication platform for individuals from government, non-government, university institutions, professional bodies, and international organizations working in OH-related areas. The OH Network South Asia was established in Hubnet, a web-based communication and collaborative system developed by Massey University, with a current membership of 249 professionals working in OH-related areas in South Asia [7]. A national OH symposium was supported in each country, culminating with a regional OH symposium (at Paro, Bhutan, December 2013) during which nine regional resolutions were formulated to strengthen OH in the region. Unfortunately with the withdrawal of funding all the activities came to an end and no regional initiative was taken to sustain these regional initiatives. The One Health Alliance of South Asia (OHASA) was established as a regional network of scientists and policy-makers to promote and practice One Health in the region [8].

A small number of multisectoral OH research and OH capacity building programmes were conducted in the region. The governments of Bangladesh and Bhutan have established operational OH strategies with variable progress in institutionalizing OH in other countries. Lack of information sharing mechanism, regional early warning system, collaboraFtive culture, functional regional forum and strong political will hinders functional regional collaboration on One Health.

1.5 QUADRIPARTITE ONE HEALTH JOINT PLAN OF ACTION

In March 2022, at the Twenty-eighth Tripartite Annual Executive Meeting, four organizations signed a memorandum of understanding (MoU) to reflect a change from the tripartite (WHO, FAO, WOAH) to a new quadripartite partnership, with UNEP as an equal partner.

The new quadripartite MoU provides a legal and formal framework to tackle the challenges at the human, animal, plant and ecosystem interface using a more integrated and coordinated approach, which is known as the quadripartite One Health Joint Plan of Action (OH JPA) [9]. This framework will also contribute to reinforce national and regional health systems and services.

The quadripartite OH JPA is built upon six action tracks:

Action Track 1: Enhancing One Health capacities to strengthen health systems (***OH coordination mechanism and capacity***)
Action Track 2: Reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics (***Pandemic preparedness and response)***
Action Track 3: Controlling and eliminating endemic zoonotic, neglected tropical and vector borne diseases ***(Endemic disease control)***
Action Track 4: Strengthening the assessment, management and communication of food safety risks ***(Food safety)***
Action Track 5: Curbing the silent pandemic of AMR ***(AMR containment)*** and
Action Track 6: Integrating the environment into One Health ***(Health of environment)***

1.6 THE PROCESS OF UPDATING BANGLADESH ONE HEALTH STRATEGIC FRAMEWORK

One Health Secretariat (OHS), one behalf of the Government of Bangladesh initiated the process of updating One Health Strategic Framework (OHSF). The revision of the framework takes into account the present national and global context of One Health. The new definition of One Health by OHHLEP embraces a wider scope for mitigating One Health related concerns at global, regional and national level. The COVID -19 pandemic has also changed the dimensions and context at all levels that also require a changed approach for preventing future pandemic. The World Health Assembly has also updated the IHR for transparency and preemptive actions to reduce the risk of future pandemics. These all new developments have created a new context for updating Bangladesh OHSF. The One Health Secretariat (OHS) in collaboration with the One Health Bangladesh played a lead role in the process of updating the framework, while FAO provided technical facilitation support with funding from the World Bank.

As a part of the process of updating the Framework, a qualitative desk review was conducted from October 2023 to February 2024. Following a kick-off sensitization meeting involving all relevant stakeholders, a series of participatory workshops were organized (Appendix 1). In the first scoping workshop, the existing One Health capacity in Bangladesh was assessed using the One Health Assessment Tool (OMAT). Additionally, using a problem-solution tree approach the scopes of One Health in Bangladesh in the present national and global context were defined. The problem-solution trees were built around the six action tracks of the quadripartite OH JPA. As a final outcome of the desk review and the scoping workshop major strategic issues or programmatic areas were identified. In a follow up meeting with the OHS and One Health Bangladesh (OHB) Coordination Committee, the strategic priority areas and possible components of the updated Strategic Framework were identified, which took into consideration the components of the existing Framework, and OH JPA Action tracks. A total of 11 components were selected, which were aligned with the six action tracks of OH JPA. In a separate subsequent workshop organized by the Quadripartite Forum, the alignment of components of Bangladesh OHSF with the OH JPA action tracks were further discussed.

For further development of the OHSF, four thematic workshops were organized with the relevant stakeholders to elaborate the strategic outputs, action packages, and major activities under 11 components. It was ensured that the strategic outputs, action packages and activities adhere to one of the three pathways of changes, namely (a) policy, legislation, advocacy, and financing, (b) organizational development, implementation and sectoral integration, and (c) data, evidence and knowledge. A Theory of Change (ToC) was built defining the long-term and intermediate outcomes and the vision of Bangladesh OHSF.

Chapter 2

Bangladesh One Health Country Profile - A Situation Analysis

2.1 GEOGRAPHIC, DEMOGRAPHIC AND ECOLOGICAL CHARACTERISTICS OF BANGLADESH AND SUSCEPTIBILITY TO HEALTH THREATS

Bangladesh is located in the low-lying Ganges delta. With 165.16 million inhabitants in a geographical area of 147.6 thousand square kilometers, Bangladesh is one of the most densely populated countries in the world (Figure 4) with an average population density of 1,119 per square kilometer, as estimated in 2021 [10]. Approximately 80% of the landmass is made up of fertile alluvial lowland called the Bangladesh Plain [11]. Bangladesh is bordered on the west, north, and east by a 4,095 kilometers land frontier with India and, in the southeast, by a short land and water frontier of 193 kilometers with Myanmar, On the south is a highly irregular deltaic coastline of about 580 kilometres (360 mi), fissured by many rivers and streams flowing into the Bay of Bengal [12]. The mighty network of four river systems flows through Bangladesh plain, namely Jamuna-Brahmaputra, Padma-Ganges, Surma-Meghna and Padma-Meghna river systems. A fifth river system, unconnected to the other four, is the Karnaphuli river system [12]. The rivers of Bangladesh mark both the physiography of the nation and the life of the people. The great river system is at the same time the country's principal resource and its greatest hazard.

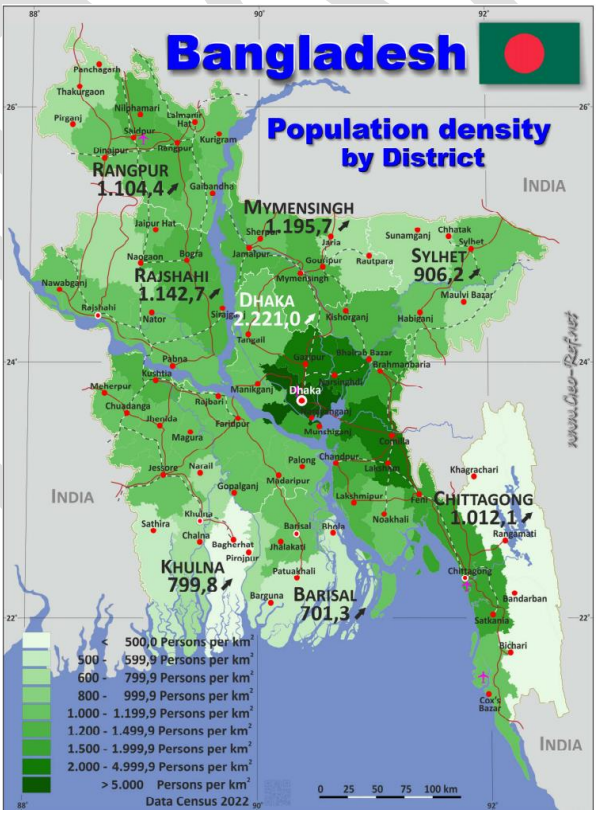


Figure 4: Population Density by Divisions (Bangladesh Census 2022)

Bangladesh reached lower-middle income status in 2015. It is on track to graduate from the UN's Least Developed Countries (LDC) list to a developing country in 2026. Urbanization is growing rapidly with 31.51% of the population living in urban areas [10]. However, a significant proportion of the labour force is still absorbed in agriculture. According to the latest Household Income and Expenditure Survey (HIES) 2022, the main occupation of 27.40% of household heads is agriculture, animal husbandry, fisheries or forestry [13]. A much larger proportion of the population is directly or indirectly involved with agriculture, animal husbandry, fisheries and forestry.

The density of the animal population is also very high in Bangladesh with 26.53 million large ruminants, 31.02 million small ruminants and 396 million poultry [14], giving a livestock density of large ruminants 180/km2, small ruminants 210/km2, and poultry 2,684/km2. Bangladesh has one of the highest livestock densities in the world [15]. The global distribution cattle and chicken densities are shown below (Figure 5).

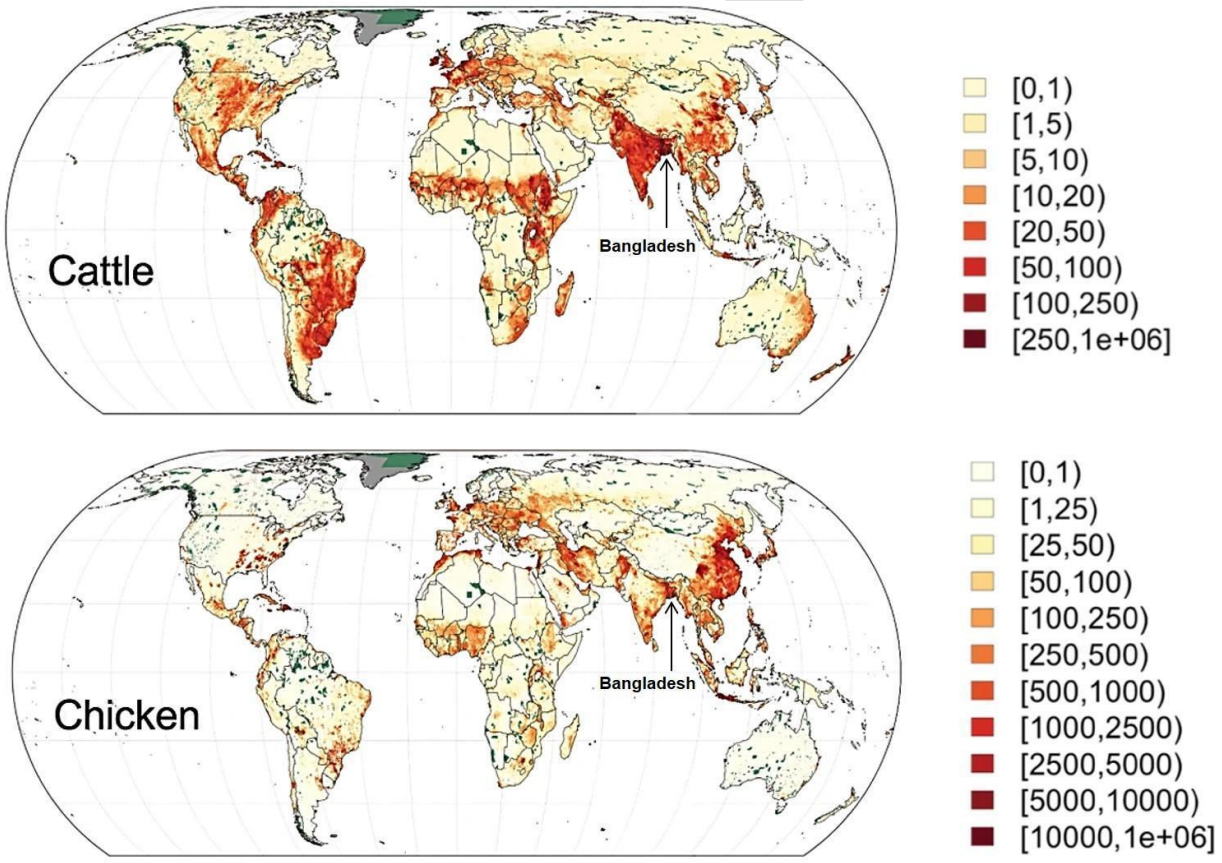


Figure 5:Global distribution of cattle and chickens (After Gilbert et al. 2018 [16])

While the large-scale commercial livestock and poultry farming are developing, most of the livestock is reared in subsistence farms or small-scale commercial farms. Hence, millions of people come into contact with poultry, cattle, sheep, goats, pigs, fish and other animals on a daily basis. Interaction between humans and poultry or other livestock species is intense and frequent in both rural and urban communities through farming as well as trading and processing at live bird markets and slaughterhouses.

The rapid expansion of Bangladesh's poultry sector can be seen in Figure 6, which shows the rise of Live Bird Markets in the Dhaka Metropolitan Area from 2008 to 2022. Among poultry breeds, the explosive expansion of the Sonali breed—a crossbreed of Rhode Island Red cocks and Fayoumi hens—is significant. A 2018 study reported an annual production of 510 million Sonali birds, accounting for 41% of the country's total poultry trade by species. The study also

highlighted major concerns regarding the absence of Avian Influenza vaccinations among Sonali breeders.

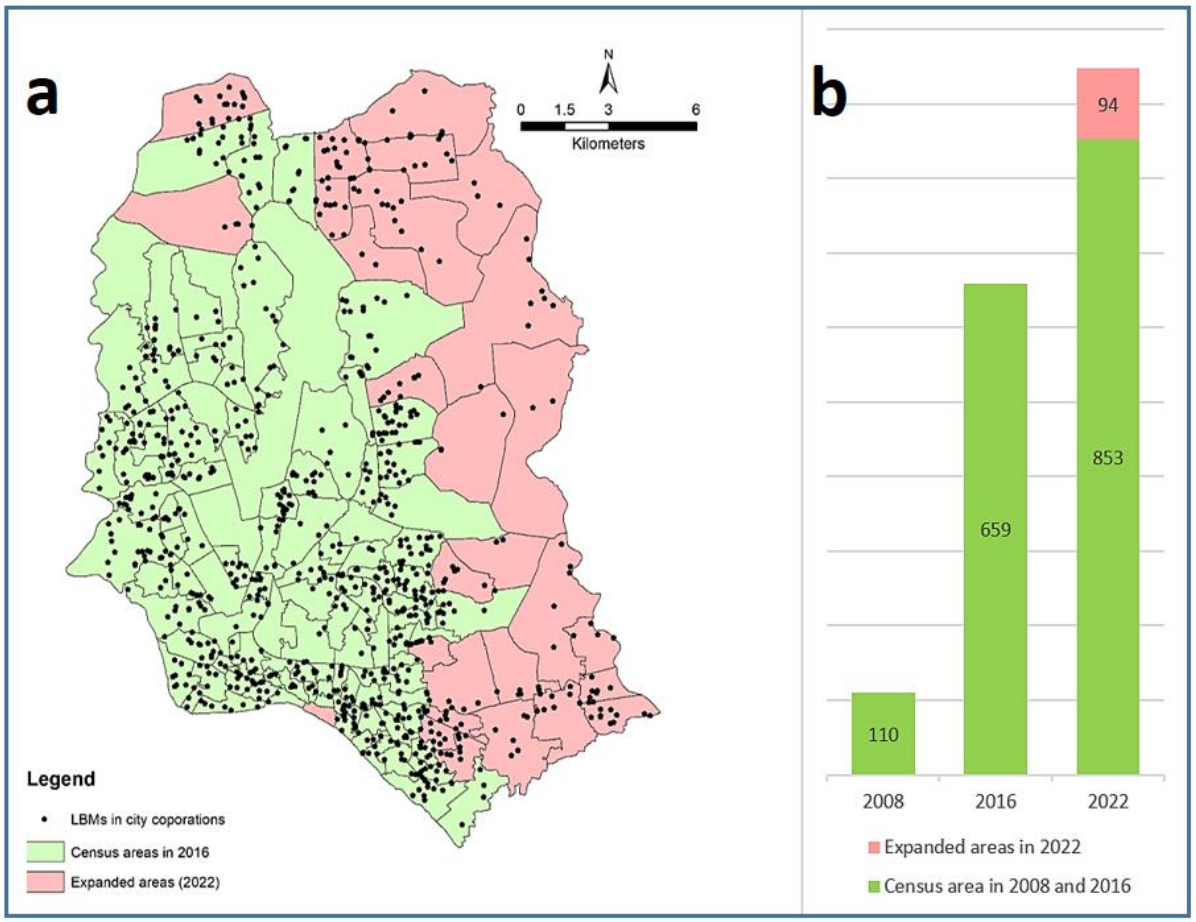


Figure 6:(a) Live Bird Markets (LBM) identified in Dhaka Metropolitan Area (DMA) in 2022; (b) Number of LBMs in DMA in 2008, 2016 and 2022

In terms of transboundary livestock movement, the rapid assessment of animal movement report of 2017 at the boundary of India and Bangladesh suggests that the highest number of livestock are imported into Bangladesh from West Bengal and Uttar Pradesh states of India and mostly concentrated in cities like Dhaka. The high density of and interaction between human and livestock coupled with the fragile and flood-prone ecosystem increases Bangladesh's risk for zoonotic threats, emerging and re-emerging infectious diseases and pandemics. In addition to human contact with domestic animals and livestock, opportunities for disease transmission from wild animals to domestic animals and humans at human-animal-environment interfaces are increasing due to encroachment of wild animal habitats with urbanization, expansion of cultivation and deforestation. A 2023 paper by Nasir Uddin et. al. [17] highlighted the role of Bangladesh in transnational live wild felid trade. The paper highlights the role of Bangladesh as an importer of live felids as well as a source of live felids for at least 15 countries (Figure 7) and necessitates being taken note of in the context of wildlife trafficking and global health security.

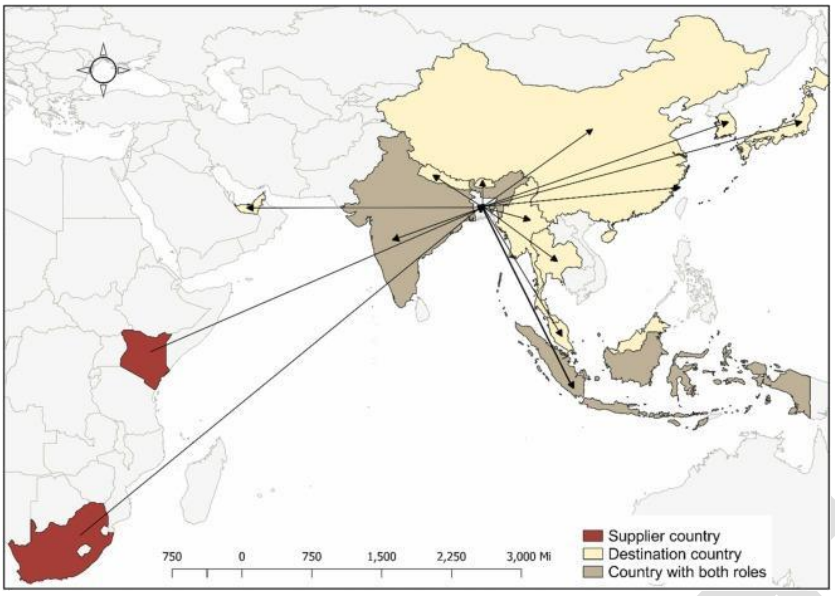


Figure 7:Wild felids trafficking routes into and outside Bangladesh
(Uddin et al., 2023 [17])

The high density of and interaction between human and livestock coupled with the fragile and flood-prone ecosystem increases Bangladesh's risk for zoonotic threats, emerging and re-emerging infectious diseases and pandemics. In addition to human contact with domestic animals and livestock, opportunities for disease transmission from wild animals to domestic animals and humans at human-animal-environment interfaces are increasing due to encroachment of wild animal habitats with urbanization, expansion of cultivation and ecosystem degradation including deforestation and biodiversity loss.

All three planetary crisis, namely pollution, climate change and biodiversity loss are very severe in Bangladesh. Being located on the low-lying Ganges delta, Bangladesh's already stressed environment is susceptible to erosion, flooding, cyclones, and severe monsoons. In addition, excessive use of groundwater for drinking water and irrigation, falling of water table, increased arsenic content in drinking water, pollution of surface water by industrial, agricultural and urban effluents, increasing water and soil salinity in some coastal areas, soil degradation due to intensive cropping, depletion of organic matter and unbalanced use of fertilizers, use of pesticides in crop production, etc. are increasing health hazards and food safety concerns.

Climate change is a critical issue in Bangladesh as the country is one of the most vulnerable to the effects of climate change. Bangladesh's vulnerability to the effects of climate change is due to a combination of geographical factors, such as its flat, low-lying, and delta-exposed topography and socio-economic factors, including its high population density, levels of poverty, and dependence on agriculture. The impacts and potential threats include sea level rise, temperature rise, food crisis, droughts, floods, and cyclones. Natural hazards that come from increased rainfall, rising sea levels, and tropical cyclones are expected to increase as the climate changes, each seriously affecting agriculture, water and food security, and human, animal, aquatic and environmental health.

In 2017, Bangladesh prioritized the following six zoonotic diseases: anthrax, brucellosis, Nipah, rabies, zoonotic influenza, and zoonotic tuberculosis (Table 1) [18].

Table 1. Prioritized zoonotic diseases selected in Bangladesh during the One Health Zoonotic Disease Prioritization Workshop in July 2017 *(Listed alphabetically and not in ranked order)*

Zoonotic Disease	Causative Agent	Human Disease Burden	Animal Disease Burden	Diagnostics, Treatment, and Prevention
Anthrax	Bacteria	Anthrax is present in Bangladesh and in some years hundreds of human cases are reported [3].	Between 2010-2012, nearly 6,000 animals were diagnosed as suspect anthrax cases and 800 animals died due to anthrax based on secondary surveillance data [4].	Effective animal vaccine and treatment for humans exist [5].
Brucellosis	Bacteria	In serological surveys in Bangladesh, human exposure varied according to profession [6, 7], ranging up to 18.6% among dairy milkers.	Brucellosis is present in animal populations of Bangladesh, with nearly 10% of cattle and 20% of goats showing serological evidence of infection [6, 7].	Effective treatment for humans is available. Brucellosis is prevented in humans by controlling the infection in animals and by boiling or pasteurizing milk and dairy products. Effective animal vaccines exist for brucellosis [8].
Nipah	Virus	In Bangladesh, Nipah virus has a human case fatality rate of >70% [9]. The country has experienced recurrent outbreaks since 2001 [7].	*Pteropus* fruit bats are the reservoir host for Nipah virus; however, livestock can also be infected. One serosurvey found 44% of pigs near a bat roost had serological evidence of infection [10].	There are no vaccines or specific treatments to prevent or cure infection by Nipah virus [11].
Rabies	Virus	It is estimated that Bangladesh has 2,000-2,500 human cases of rabies each year [12].	Rabies is endemic and under-reported in animal populations in Bangladesh [4].	Effective animal vaccine exists. Post-bite management for humans is very effective and available. Once symptoms begin in humans, almost all patients have died [13].
Zoonotic influenza	Viruses	Strains of zoonotic influenza virus have caused human infections in Bangladesh; there were eight H5N1 cases from 2008-2016, including one death and several cases (3) of H9N2 [14].	Zoonotic influenza strains routinely circulate in Bangladesh. The country experienced a major H5N1 poultry outbreak in 2007, resulting in 2.6 million birds culled, 3 million eggs destroyed, $3.88 million paid to the farmers as compensation [15], and an estimated loss of Tk 55 billion ($757.9 million) [7].	Treatment for humans is mainly supportive [5]. Specific antiviral is also available.
Zoonotic Tuberculosis	Bacteria	Bangladesh is one of the highest tuberculosis burden countries in the world [7]; however, the proportion due to zoonotic tuberculosis is not known. Globally it is estimated that *M. bovis* results in >120,000 human cases and >10,000 deaths annually [16].	The burden of zoonotic tuberculosis in animals around the world is largely unknown. Studies in Bangladesh have shown evidence of infection in cattle herds [7]. No surveillance data are available.	Effective treatment exists for humans. New candidate vaccines are being tested [17].

Table 1: Prioritized zoonotic diseases selected in Bangladesh during the zoonotic disease prioritization workshop in July 2017

In 2023, a "Climate Sensitive Zoonotic Diseases List" report was jointly developed by the World Bank, International Centre for Diarrheal Disease Research, Bangladesh (icddr,b), and the University of Queensland. The report identified Japanese encephalitis, anthrax, leishmaniasis, Escherichia coli (including EHEC, ETEC and O:157), and salmonellosis as the top climate-sensitive zoonotic disease risks (Figure 8).

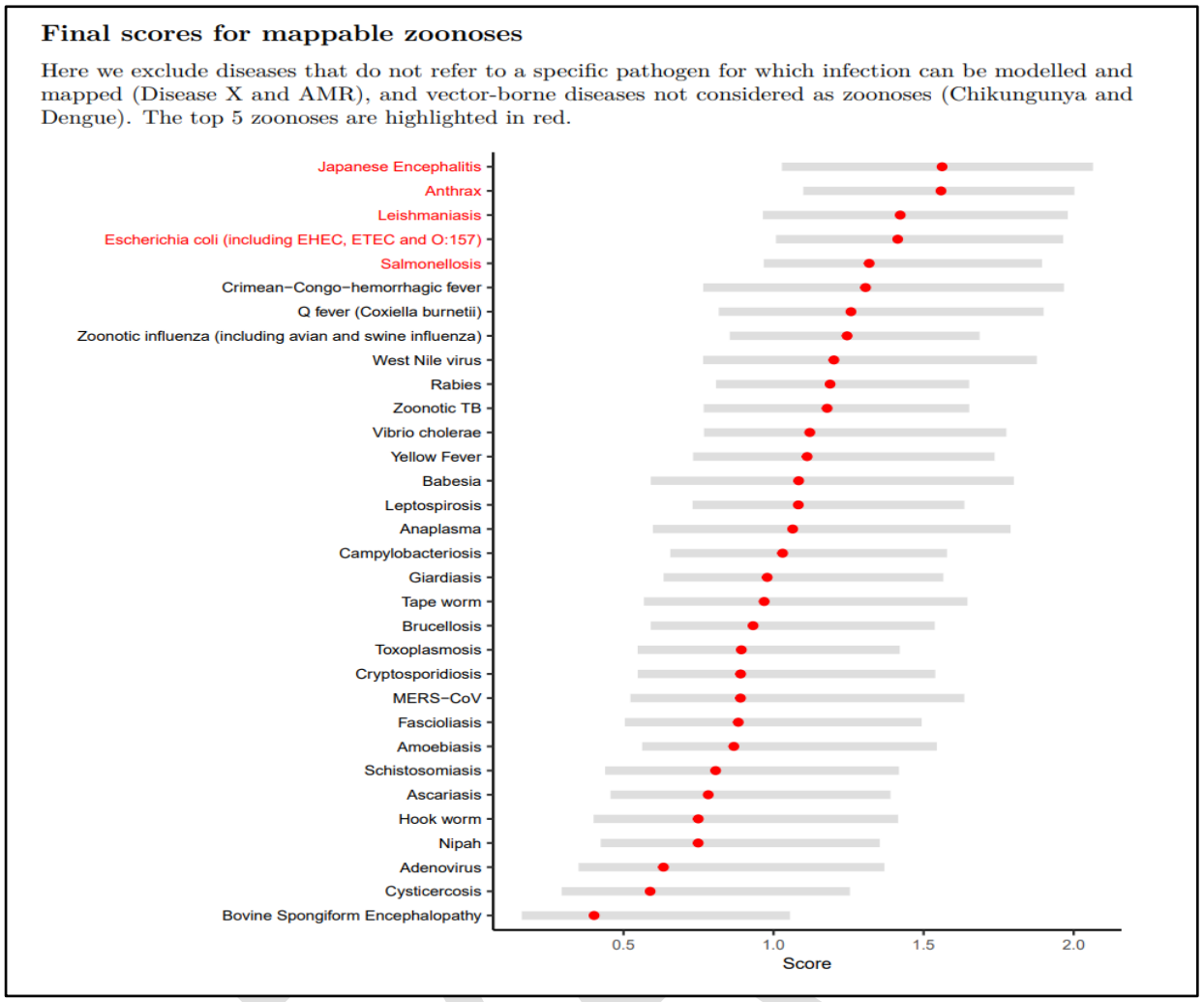


Figure 8: Climate-sensitive zoonotic diseases, (World Bank, Icddr,b, University of Queensland)

Among both the list of prioritized zoonotic diseases and climate-sensitive zoonotic diseases, Nipah virus (NiV) stands out due to its severe health implications and the high case fatality rate associated with infections. Since the first recognized outbreak in 2001, Bangladesh has reported over 300 cases of Nipah virus infection, with 242 fatalities where case fatality rates go up to 70%. The central and northwestern part of Bangladesh is called the 'Nipah Belt' which comprises Rajshahi and Rangpur divisions of the country [19] (Figure 9). The virus has been reported in 34 districts out of the country's 64. The government has established hospital-based sentinel surveillance systems to detect and respond to Nipah outbreaks promptly.

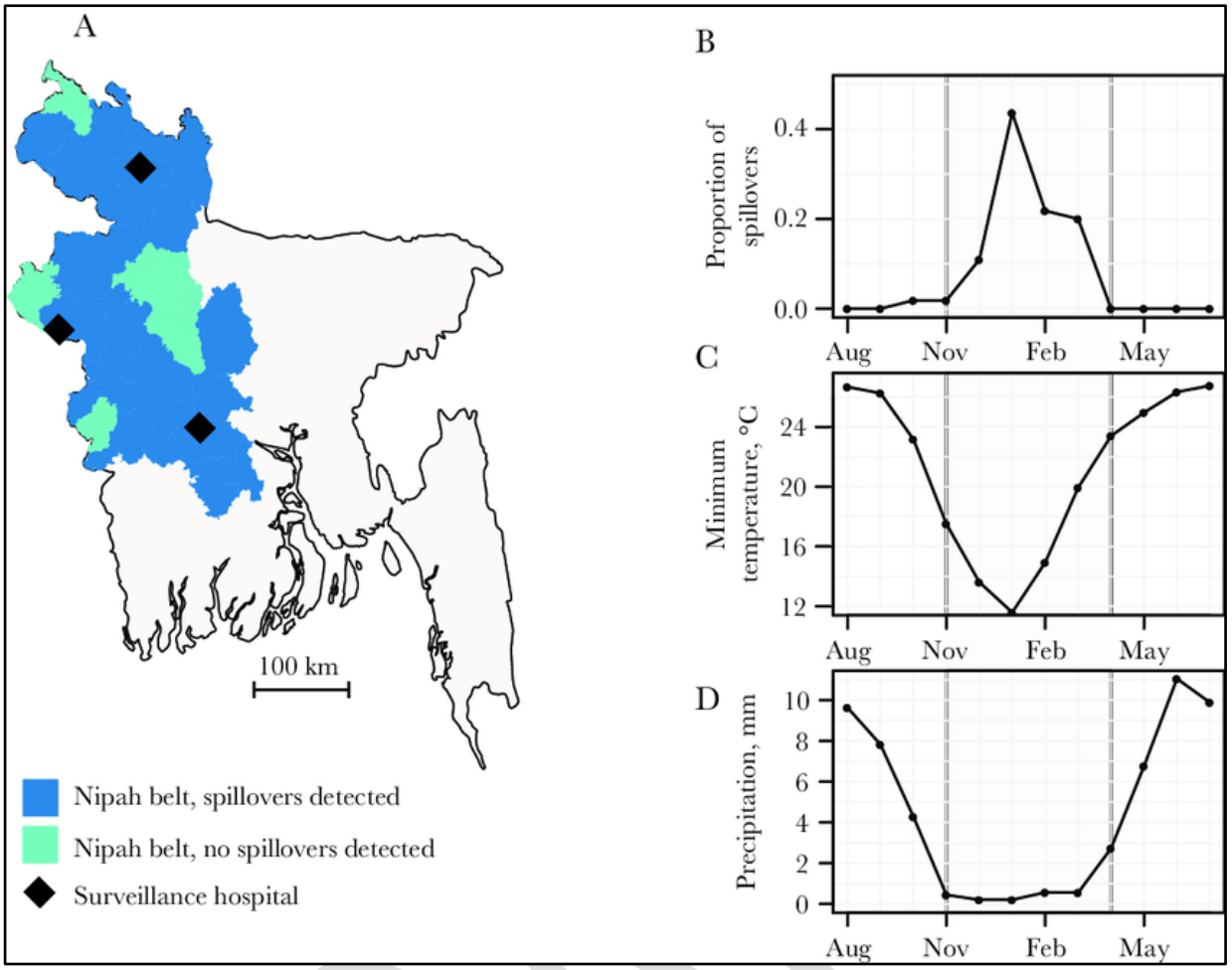


Figure 9: (A) Map of Bangladesh showing Nipah belt. (B) Proportion of all observed spillover events by month. (C) Monthly mean minimum temperature and (D) mean precipitation for 10 districts, averaged for each month during 2007–2013. [19]

2.2 TWO DECADES OF ONE HEALTH COLLABORATION IN BANGLADESH

Following an outbreak of Nipah Virus (NiV) in January 2005, the Institute of Epidemiology, Disease Control and Research (IEDCR), the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and US CDC agreed to a collaborative outbreak investigation, setting the stage for a mutually beneficial and trusting relationship.

The emergence of the global panzootic of highly pathogenic avian influenza (HPAI) was a new driving factor for consolidation of One Health movement across the globe. n 2007, after the incursion of H5N1 HPAI in Bangladesh, public health experts, veterinary community, as well as professionals from the wildlife and agricultural professions partnered together under the framework of Avian Influenza and Pandemic Influenza Preparedness and Response Plan. Multisectoral committees were formed at all tiers of the government to manage HPAI.

In September 2012, FAO delivered a training course on Wildlife Investigation of Livestock Diseases (WILD) and Public Health. In 2013, the MoHFW and MoFL endorsed a FAO, OIE and WHO-supported project in Bangladesh to link animal health and human health epidemiology and laboratory information.

In 2013, the MoHFW partnered with the US CDC to launch a Field Epidemiology Training Program, Bangladesh (FETPB). Beginning in October 2014, a two-year One Health Epidemiology Fellowship Program, funded by the EU, was delivered to postgraduates from human, animal and wildlife health sectors, through a collaboration between Massey University of New Zealand and IEDCR, where the program is housed. One Health is also being introduced at postgraduate-

level curricula in Bangladesh; the Bangladesh University Grants Commission approved a One Health Institute at CVASU in May 2015.

Other notable examples of One Health engagement in Bangladesh are Joint External Evaluation in 2016 and in 2024, prioritization of zoonotic diseases in 2017, development of the draft National Action Plan for Health Security (NAPHS) in 2019, conducting occasional joint outbreak investigations on important health hazards like anthrax, birds die off, cattle mortality, etc., development of Bangladesh AMR Response Alliance (BARA) – a One Health community of practice on AMR, development of national AMR Containment Action Plan, collaborative implementation of rabies elimination program of DGHS involving DLS, local government, NGOs and development partners, etc. The One Health Secretariat also launched a One Health Event Based Surveillance System Dashboard.

The COVID-19 pandemic underscored the need for One Health approach in responding to pandemics. A One Health approach was utilized in laboratory detection of COVID-19 virus. Along with public health laboratories, several animal health laboratories participated in providing COVID-19 virus diagnostic services. Moreover, an One Health expert panel provided training, mentoring and troubleshooting support on laboratory biosafety and quality control. The most recent example of One Health engagement is the development of the Pandemic Fund grant proposal for the first and second call, where the public health, animal health and wildlife sectors actively participated and jointly prepared the proposal.

2.3 ONE HEALTH STAKEHOLDERS IN BANGLADESH

With the ever increasing horizon or spectrum of One Health, the number of One Health stakeholders is increasing. The necessity of involving the Department of Agriculture Extension (DAE), in addition to public health, animal health and wildlife sectors, was felt from the beginning. Subsequently the Department of Environment (DoE) and the Department of Fisheries (DoF) also got involved. During the process of updating the Strategic Framework through a series of thematic workshops, many new stakeholders were identified. They are listed in Figure 10.

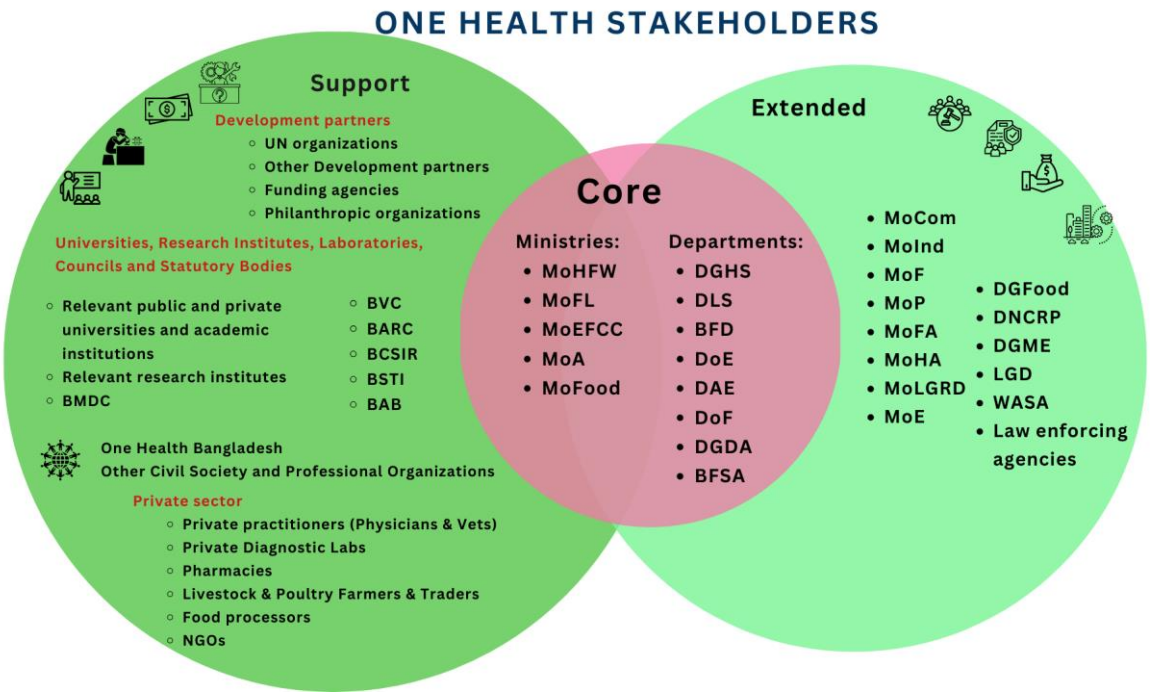


Figure 10: Currently engaged and future potential One Health stakeholders in Bangladesh

[MoHFWF: Ministry of Health and Family Welfare; MoFL: Ministry of Fisheries and Livestock; MoEFCC: Ministry of Environment, Forestry and Climate Change; MoA: Ministry of Agriculture; MoFood: Ministry of Food; MoF: Ministry of Finance, MoP: Ministry of Planning; MoFA: Ministry of Foreign Affairs; MoHA: Ministry of Home Affairs; MoLGRD: Ministry of Local Government and Rural Development; MoE: Ministry of Education; DGHS: Directorate General of Health Services; DAE: Department of Agriculture Extension; DLS: Department of Livestock Services; BFD: Bangladesh Forest Department; DoE: Department of Environment; DoF: Department of Fisheries; DGDA: Directorate General of Drug Administration; BFSA: Bangladesh Food Safety Authority; DGME: Directorate General of Medical Education; BMDC: Bangladesh Medical and Dental Council; BVC: Bangladesh Veterinary Council; BARC: Bangladesh Agriculture Research Council; BCSIR: Bangladesh Council of Scientific and Industrial Research; OHB: One Health Bangladesh; CSO: Civil Society Organization; NGO: Non-government Organization; UN: United Nations; DP: Development Partner; LGD: Local Government Department; BSTI: Bangladesh Standard Testing Institute; BAB: Bangladesh Accreditation Board; DFood: Department of Food; BAEC: Bangladesh Atomic Energy Commission; DNCRP: Department of National Consumer Rights Protection; WASA: Water and Sewerage Authority]

2.4 ONE HEALTH LEGISLATIONS AND POLICIES

2.4.1 Legislations

There is no dedicated One Health Law in Bangladesh. However, there are a number of laws that address issues relevant to One Health. There are overlaps in the laws and inadequate awareness, financial and non-financial resource limitations impede enforcement of these laws. Important relevant laws, their major focus and lead Ministries are presented in tabular form in Appendix 2.

Most of these acts have been developed from sectoral perspectives. Some of the acts have addressed multisectoral dimensions. However, a coordinated One Health approach as such has not yet been reflected in any of these laws.

2.4.2 Policies and action plans

Apart from these laws, there are a good number of policies and action plans relevant to One Health. The one which is exclusively dedicated to One Health is the Bangladesh One Health Strategic Framework and Action Plan. The second Strategic Framework had 7 components, including (1) Governance and coordination, (2) Coordinated surveillance, (3) Coordinated outbreak investigation, (4) Interdisciplinary research, (5) Networking and partnership, (6) Strategic communication and advocacy, and (7) Capacity building (workforce and laboratory. Pandemic prevention, preparedness and response was not addressed exclusively but remained embedded in coordinated surveillance and outbreak investigation. AMR was partly addressed under surveillance. Other new dimensions of One Health, such as food safety and environmental health were not addressed specifically. The third version of the Framework under development will have dedicated components on pandemic prevention, preparedness and response, food safety and environmental health.

The National Health Policy was published in 2011. The National Action Plan for Health Security (NAPHS) was drafted in 2019. Recently, the National Public Health Emergency Preparedness and Response Plan for Infectious Hazards (PHERP-IH) in Bangladesh (2023-2028) also has been developed. The PHERP-IH emphasizes One Health approach, emergency operation centre, incident management system, risk communication and response capacities at the sub-national levels.

In the animal health sector, National Livestock Development Policy and National Poultry Development Policy were approved in 2007 and 2008, which are currently under revision. Recently, An Investment Plan to Strengthen the Regulatory Capacity of the DLS was developed in 2022 with support from FAO, which is very much related to One Health capacity building of

DLS. Among others, the investment plan emphasized on the regulatory capacity building of DLS for livestock disease control and food safety along with the development of a robust animal health database and the organizational and infrastructural set up for veterinary inspection and certification. The National Strategy and National Action Plan for AMR containment (2021-2026) has been approved in 2022.

Several policy documents and action plans are available in the environment sector, such as National Environment Policy 2018, National Adaptation Plan (2023-2050), Bangladesh National Conservation Strategy (2021-2036), and Bangladesh Climate Change Strategy and Action Plan 2009. A separate Health National Adaptation Plan (H-NAP) has also been drafted.

2.5 ONE HEALTH INVESTORS

Recently FAO has published a document "One Health Resource Partner and Investor Profiles" to support One Health investment planning and leverage. Bilateral donors, multilateral development banks, regional organizations, global initiatives for supporting health and environment, research organizations, UN organizations, Philanthropies are major players for funding Global Health Security and One Health in different forms. In Bangladesh, the investors and resource partners supporting programmes related to OH include:

- Gavi, the Vaccine Alliance
- The Coalition for Epidemic Preparedness Innovations (CEPI)
- The World Bank
- Asian Development Bank (ADB)
- Vertical funds, including: The Pandemic Fund GEF and GCF
- UK Foreign, Commonwealth and Development Office (FCDO): Fleming Fund
- United States Agency for International Development (USAID): Supporting various health issues, with a focus on OH system strengthening, OH communication, AMR, TB, and spillover
- Eastern Mediterranean Public Health Network (EMPHNET)
- The Antimicrobial Resistance Multi-Partner Trust Fund (MPTF)
- The US Centers for Disease Control and Prevention (US CDC)

2.6. ONE HEALTH CAPACITY ASSESSMENTS

2.6.1 Assessment of One Health implementation using OHAT

A One Health Assessment Tool (OHAT) has been developed by FAO. This is a facilitated self-assessment tool for the assessment of One Health implementation that uses a set of 10 indicators and requires the contributions from all four sectors (human health, animal health, wildlife, and health of environment). The results of the national One Health implementation assessment against 10 indicators are presented in Figure 11.

The 10 indicators were (1) One Health coordination mechanism, (2) Government commitment of human resources to support One Health, (3) Government support (financial resources) for One Health field activity implementation, (4) National One Health strategy, (5) National One

Health action plan, (6) One Health data sharing, (7) One Health policies, (8) National One Health risk communication strategy, (9) Whole of the society approach to One Health, and (10) Competent One Health workforce.

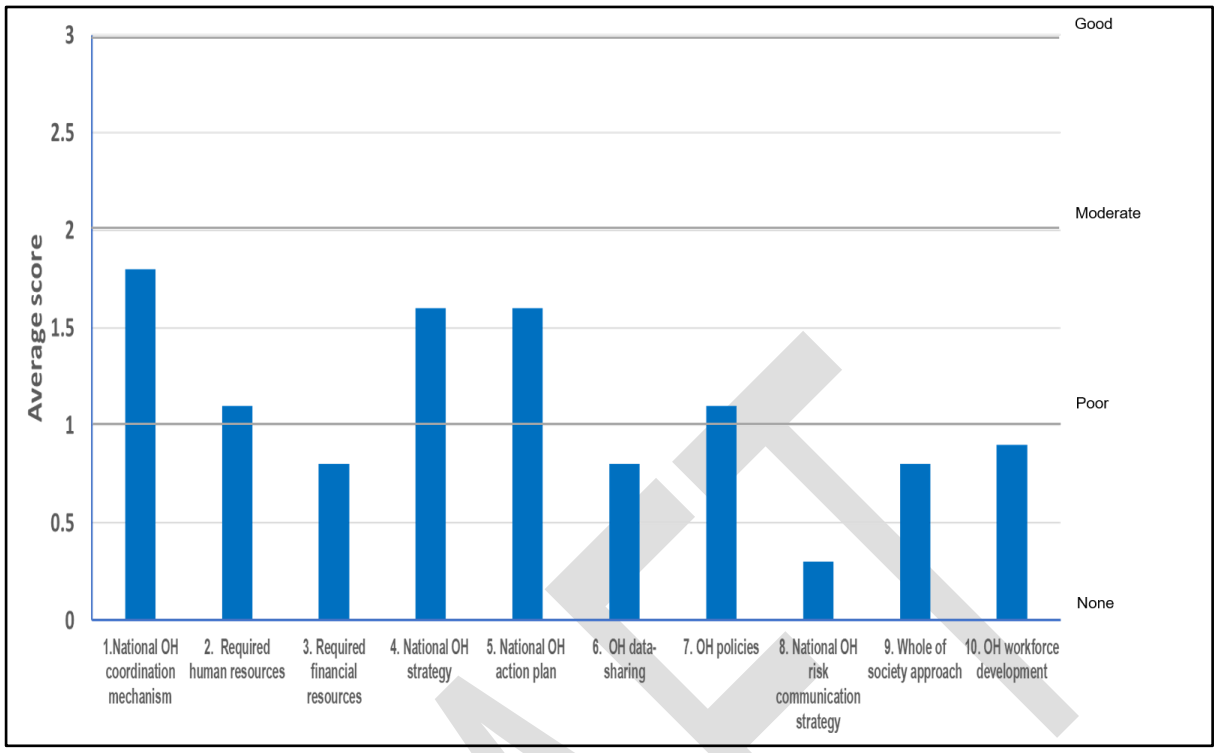


Figure 11: National One Health implementation assessed against the 10 One Health indicators. Responses of the participants from all the sectors were combined

According to the responses from the participants from across the sectors, it was revealed that at national level the indicators that are moderately strong in One Health implementation relating include One Health coordination mechanism, One Health Strategy, and One Health action plan. On the other hand, One Health implementation appeared to be relatively poor with regard to the indicators like human resources, financial resources, data sharing, policies, risk communication strategies, a whole of society approach and One Health workforce. These findings warrant further improvement of national One Health implementation in all regards.

There were some variations in the responses from the participants belonging to different sectors. The sector-wise responses are presented in Figure 12. In general, the human health and animal health sectors rated One Health implementation more strongly than the wildlife and environment sectors. This was not unexpected as the participants from human health and animal health sectors are relatively more involved in One Health activities in the country, while the wildlife, environment and agriculture sectors are relatively new actors and less engaged in One Health implementation to date.

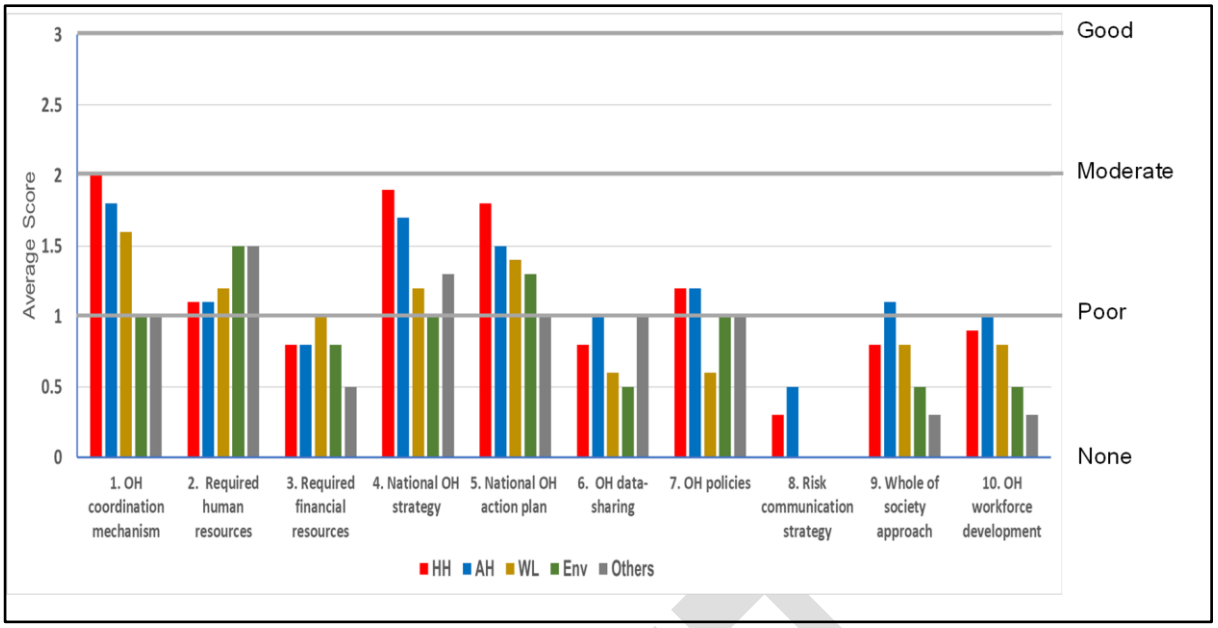


Figure 12: National One Health assessment by sector

(HH: Human health, AH: Animal health, WL: Wildlife health & management, Env: Environment including agriculture)

2.6.2 Joint External Evaluation

Joint External Evaluation (JEE) of International Health Regulation (IHR) capacities have recently been conducted in July 2024. The previous JEE was conducted in 2016. The average scores of IHR capacities in JEE 2024 are presented below (Table 2).

Table 2: Average scores of IHR capacities in JEE 2024

No capacity (score 1)	**Limited Capacity (score 2)**	**Developed Capacity (score 3)**	**Demonstrated capacity (score 4)**	**Sustained Capacity (Score 5)**
	P2. Financing P6. Food safety R4. Infection prevention & control	P1. Legal Instruments P3. IHR coordination, national IHR Focal Point functions & advocacy P5. Zoonotic diseases P7. Biosafety and biosecurity R1. Health emergency management R2. Linking public health and	P4. Antimicrobial resistance D1. National laboratory system D2. Surveillance D3. Human resources R5. Risk communication & community engagement PoE. Points of entry RE. Radiation emergencies	P8. Immunization

		security authorities R3. Health services provision CE. Chemical events		

The evaluation conducted in 2024 revealed that Bangladesh had made great strides in immunization, but there were opportunities for improvement in each technical area that requires the country's highest commitment and support, working closely together with development partners. The evaluation identified the following overarching issues that need improvement:

Bangladesh has an extensive array of legal instruments which have been effectively utilized for responding to the COVID-19 pandemic and through the lessons learned, moves are afoot to review and revise or enact needed legislation. *Commissioning a comprehensive and rapid legal mapping, analysis and review to aid legislation to ensure compliance to the International Health Regulations (IHR), fast tracking the generation of rules based on bills; endorsement of strategies, policies and guidelines developed; and ensuring enforcement and compliance through the establishment of effective implementation monitoring and accountability frameworks is essential to advance the critical interventions needed for strengthening health security through the One Health approach.*

The momentum created by an impressive average annual growth rate of 6.6 percent over the decade preceding the COVID-19 pandemic - which has relatively dampened real GDP growth, is keeping Bangladesh on track to graduate from the UN's Least Developed Countries list in 2026. The World Bank is advocating for fiscal reforms to generate more domestic revenue for development to enable Bangladesh to achieve its vision of attaining upper middle-income status by 2031. *In parallel, strategic enhancement of financial allotment for national health system development and national health security strengthening, especially using domestic resources and effective utilization by optimized financial management practices is critical for enhancing International Health Regulations (IHR) core capacities through advancing the priority actions recommended by this Joint External Evaluation of IHR.*

The Global Strategy on Human Resources for Health: Workforce 2030 (GSHRH) emphasizes the criticality of the health workforce (HWF) for a well-functioning and resilient health system. Bangladesh is committed to achieving universal health coverage (UHC) and is a pioneer in advancing the One Health approach for enhancing national health security. *An adequate and motivated One Health workforce especially in the public sector, with the appropriate competencies and skill-mix, distributed equitably in areas of highest need through rapid recruitment to fill shortfalls, addressing incentive, performance and retention challenges, and commitment to continuous professional development is imperative for enhanced human, animal and environmental health in the country.*

The overall and sectoral development programmes of Bangladesh in health have enabled noteworthy improvements and innovations in systems and delivery of services leading to accelerated poverty reduction, human development and life-expectancy. *To meet the rapid and complex changes in environmental and epidemiological risks, a thorough review of the existing*

one health service delivery systems and referral pathways for continuity of care is essential to streamline access, assure quality and enhance coverage of human, animal and environmental health services and discharge essential public functions for system security and resilience.

One Health Epidemiological and Laboratory Surveillance, epidemiological and laboratory capacity to ensure risk-based public health and social measures, including at Points of Entry, have significantly improved between the last and the current JEE-IHR. *To strengthen and sustain these impressive gains it is essential to move towards next-generation collaborative multi-source One Health surveillance systems that foster seamless information exchange between sectors leveraging digital innovations and stakeholders for rapid decision making and risk-informed response; deepen epidemiological capacity by scaling up and expanding the epidemiological units established at sub-national levels; and strengthen infrastructure, human resources and capabilities at all Points of Entry – both IHR designated and non-designated, especially at border ground crossings to seamlessly link them to the national surveillance and health emergency and disaster risk management systems.*

The COVID-19 experience showed that the estimated JEE scores often did not reflect the actual capacity on the ground.

2.6.3 WHO e-SPAR

The 2022 State Party Self Assessment Annual Report (SPAR) report) for Bangladesh revealed significant challenges within its public health infrastructure (Figure 13). It reveals a critical shortage of skilled health personnel, with only 50% operational capacity, which severely limits the country's ability to effectively manage public health emergencies. The report also indicates moderate effectiveness in infection prevention and control (IPC), functioning at 53% capacity, highlighting the urgent need for improved standards and practices. Although food safety mechanisms are established, they operate at 60% capacity, suggesting that further enhancements are required to meet international standards. While policies, legal, and normative instruments are in place, their effectiveness in supporting International Health Regulations (IHR) implementation is also limited, with a noted capacity of 60%. This comprehensive evaluation points to essential areas where strategic improvements are necessary for bolstering Bangladesh's public health response capabilities.

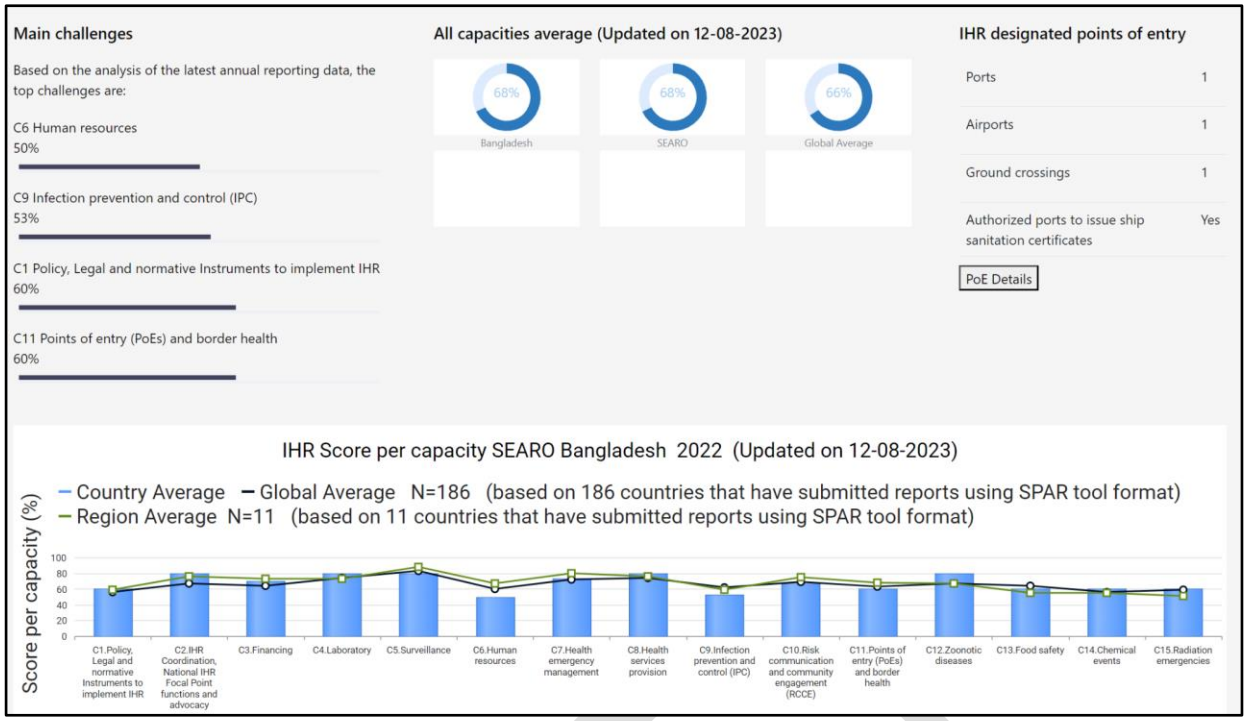


Figure 13: WHO, e-SPAR for Bangladesh

2.6.4 Performance of Veterinary Services (PVS)

PVS Gap Analysis was performed in 2015. The average scores for critical competences of veterinary services at the time of evaluation (2015) and the expected level of advancement are shown in Table 3.

Table 3: Overall scores in PVS Gap Analysis 2015

Critical competencies	Level of advancement	
	Current	Expected
Human, physical and financial resources		
I.1.A. Veterinarians and other professionals	1	3
I.1.B. Veterinary para-professionals and other technical personnel	3	3
I.2.A. Professional competencies of veterinarians	1	2
I.2.B. Competencies of veterinary para-professionals	2	3
I.3. Continuing education	2	3
I.4. Technical independence	1	3
I.5. Stability of structures and sustainability of policies	1	2
I.6.A. Internal coordination (chain of command)	3	4
I.6.B. External coordination	2	3
I.7. Physical resources	2	3
I.8. Operational funding	2	3
I.9. Emergency funding	2	3
I.10. Capital investment	2	3
I.11. Management of resources and operations	2	4
Technical authority and capability		
II.1.A. Access to veterinary laboratory diagnosis[2]	1	2
II.1.B. Suitability of national laboratory infrastructures	-	3
II.2 Laboratory quality assurance	1	2
II.3 Risk analysis	1	3
II.4 Quarantine and border security	1	3
II.5.A. Passive epidemiological surveillance	2	3
II.5.B. Active epidemiological surveillance	1	3
II.6 Emergency response[3]	1	3
II.7 Disease prevention, control and eradication	2	3
II.8.A. Regulation, authorisation and inspection of establishments[4]	-	3
II.8.B. Ante and post mortem inspection	1	3
II.8.C. Inspection of collection, processing and distribution	1	3
II.9 Veterinary medicines and biologicals	1	2
II.10 Residue testing	1	3
II.11 Animal feed safety[5]	-	2
II.12.A. Animal identification and movement control	1	3
II.12.B. Identification and traceability of products of animal origin	1	2
II.13 Animal welfare	1	3
Interaction with interested parties		
III.1 Communication	2	3
III.2 Consultation with interested parties	2	3
III.3 Official representation	2	3
III.4 Accreditation / authorisation / delegation	1	2
II.5.A. Veterinary Statutory Body authority	2	3
II.5.B. Veterinary Statutory Body capacity	2	3
III.6 Participation of producers and other parties in joint programmes	1	2
Access to market		
IV.1 Preparation of legislation and regulations	1	3
IV.2 Implementation of legislation/regulations and compliance	1	2
IV.3 International harmonisation	1	2
IV.4 International certification	2	3
IV.5 Equivalence and other types of sanitary agreements	1	3
IV.6 Transparency	2	3
IV.7 Zoning	1	2
IV.8 Compartmentalisation	1	2

The national priorities identified during the Gap Analysis were improving food security by increasing livestock meat and dairy production with improved disease control; developing export markets; improving food safety at slaughterhouses and along the value chain; prudent use of veterinary medicines; developing a pilot residue control programme; strengthening disease surveillance and the early detection of emergency diseases; improving control of economic and zoonotic diseases; reducing the impacts of priority animal diseases; and implementing a pilot traceability programme.

Last PVS was conducted in 2011, followed by Gap Analysis in 2015, and the situation has changed over the time. The present capacity needs to be evaluated by another round of PVS followed by Gap Analysis.

2.6.5 Environmental Performance Index (EnPI)

The 2024 Environmental Performance Index (EnPI) provides a data-driven summary of the state of sustainability around the world. Using 58 performance indicators across 11 issue categories, the EnPI ranks 180 countries on climate change performance, environmental health, and ecosystem vitality. These indicators provide a gauge at a national scale of how close countries are to established environmental policy targets. The EnPI offers a scorecard that highlights leaders and laggards in environmental performance and provides practical guidance for countries that aspire to move toward a sustainable future. The summary EnPI score for Bangladesh (https://epi.yale.edu/country/2024/BGD) is presented below in Figure 14 and Table 4.

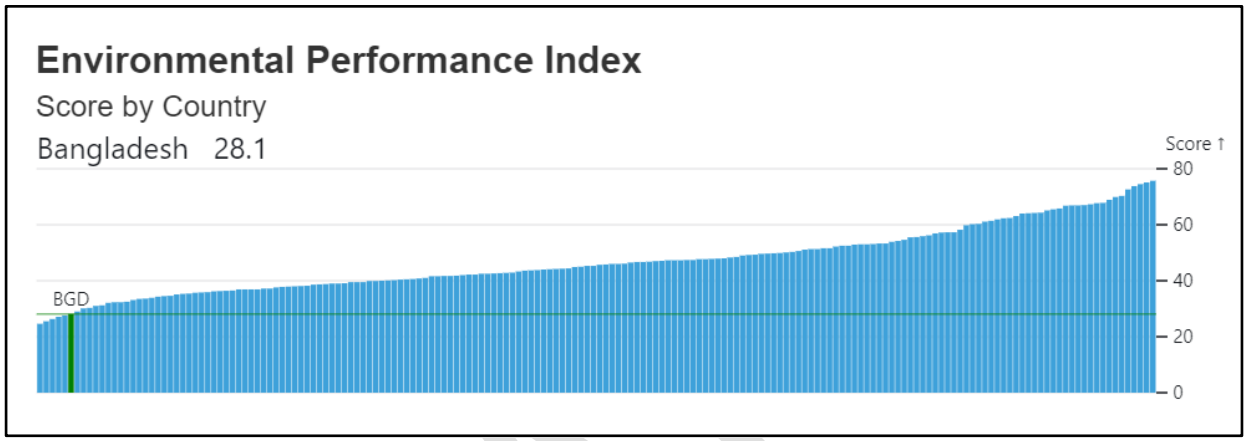


Figure 14: Environmental Performance Index of Bangladesh in global context

Table 4: Environmental Performance Index (EnPI) of Bangladesh:

Index	Issues considered	Score	10y Δ
Ecosystem Vitality	Biodiversity and habitat, Forests, Fisheries, Air pollution, agriculture and water resources	31.4	4.0
Environmental Health	Air quality, sanitation and drinking water, heavy metal, waste management,	15.0	1.9
Climate Change	Climate Change Mitigation	33.0	0.4

2.7 IMPLEMENTATION OF BANGLADESH ONE HEALTH STRATEGIC FRAMEWORK (2017-2021): ACHIEVEMENTS AND GAPS

The status of implementation of the Action Plan of Bangladesh OH Strategic Framework (2017-2021) was assessed in a participatory workshop. The participants representing different sectors were divided into seven groups and were provided with the list of activities included in the Work Plan under seven components to review their status of implementation. Then each group presented their findings in a plenary session for discussion. The summary of the achievements and gaps is presented below in Table 5:

Table 5: Implementation of Bangladesh One Health Strategic Framework (2017-2021): components, achievements gaps recommendations.

Components	Achievements	Gaps	Recommendations
1. Governance and coordination	● Institutional One Health governance with OHS, committees established. ● Some progress in collaborative planning for joint surveillance and outbreak investigation.	● Limited convening power of OHS. ● Expansion of OHS and OH coordination at sub-national level not implemented. ● Laws and acts identified but not revised for OH mainstreaming. ● Limited activities leveraging OH approach. ● Ineffective communication across sectors.	● Reconsider the structure and ToR of OHS. ● Expand Coordination Committee, form thematic sub-committees. ● Assign high-level OH focal points from the Ministry. ● Develop M&E framework
2. Coordinated surveillance	● Development of AMR and event-based surveillance data sharing platforms. ● Upazila to Community (U2C) program in the animal health sector was developed.	● Coordinated surveillance strategy and framework lacking. ● High risk areas for zoonotic diseases not identified. ● No formal assessment of surveillance capacities. ● Limited community-based strategies for disease management apart from U2C.	● Emphasize on coordinated surveillance and information sharing. ● Develop a formal OH surveillance strategy and identify high-risk areas.

3. Coordinated outbreak investigation	● Joint outbreak investigations conducted on an ad hoc basis. ● Occasional training sessions arranged	● No coordinated outbreak investigation strategy, contingency plan, or SOPs developed. ● Lack of standard training modules. ● Inadequate outbreak response personnel, epidemiologists, and equipment. ● Limited simulation exercises. ● No coordination between EOCs.	● Consider a National EOC for health emergencies. ● Develop outbreak investigation strategy and training modules. ● Establish national emerging disease preparedness program with contingency planning for all sectors ● Conduct simulation exercises for animal health, aquatic and wildlife health personnel.
4. Interdisciplinary research	● One Health conference (biannual) and technical seminars scheduled and conducted. ● OH bulletin published.	● Advocacy of research findings limited. ● Other listed activities like OH research priority setting, fellowships not implemented.	● Engage different research councils and strengthen advocacy. ● Develop a process and control of dissemination of new OH messages from research work.
5. Networking and partnership	● Limited progress noted.	● Stakeholder mapping, networking mechanisms, and international collaboration activities pending. ● Community level networking and participatory communication approach not developed.	● Leverage networking opportunities and implement strategic communication tools to communities.

6. Strategic communication and advocacy	● Disease-specific communication materials developed.	● National OH communication strategy not developed. ● No advocacy meetings organized beyond event invitations.	● Develop a common OH communication strategy or separate strategies for different components with cross-reference.
7. Capacity building (workforce and laboratory)	● Bangladesh Health Workforce Strategy 2023 Report was developed for human health sector ● Proficiency testing conducted for laboratory diagnosis of a few diseases. ● FETP and FETPV programs administered.	● No comprehensive workforce strategy in animal health, fisheries and wildlife sectors. ● Fragmentary assessment of workforce requirements. ● Limited capacity building for wildlife and fisheries labs. ● Networking of labs across sectors is not functional.	● Update workforce strategies across all sectors. ● Develop capacity for wildlife and fisheries labs. ● Ensure retention of laboratory personnel. ● Incorporate OH orientation in curriculum.

2.8 STRATEGIC PRIORITIES FOR ONE HEALTH IN BANGLADESH

The concept of One Health is evolving. Initially One Health was primarily focused on zoonotic diseases. Naturally, public health, animal health and wildlife sectors were the key actors. Later, food safety emerged as an important One Health issue. Subsequently, AMR emerged as a silent pandemic and its mitigation demanded a One Health approach. From the beginning a healthy ecosystem particularly at human-animal-environment interface was considered very important to prevent the emergence of new zoonoses and pandemics of zoonotic origin. However, according to the new definition of One Health the health of humans, domestic and wild animals, plants and the wider environment (including ecosystems) are closely linked and interdependent. In this new global context, the horizon of One Health has further expanded. The FAO, UNEP, WHO, WOAH quadripartite forum has developed a One Health Joint Plan of Action (JPA) with six Action Tracks. Based on the assessments, desk review and workshop outputs, 11 strategic priorities of One Health in Bangladesh were identified, which would constitute 11 components of the Bangladesh One Health Strategic Framework and Action Plan (2025-2030). The strategic priorities were in alignment with the six JPA Action Tracks. The identified strategic priorities are as follows:

1. Strengthening One Health governance and coordination with sustained financing and development of One Health community of practices through networking and partnership
2. Strategic communication and advocacy for protecting health of human, animal, plant and environment

3. Development and deployment of skilled One Health workforce
4. Sustained laboratory capacity and network
5. Transdisciplinary research for generating evidence-based One Health solutions
6. System strengthening for pandemic prevention, preparedness and response, and control of endemic zoonoses, vector borne diseases and neglected tropical diseases
7. Strengthening coordinated surveillance for rapid detection and early warning
8. Mainstreaming coordinated outbreak investigation and response
9. Reducing food safety risks through One Health approach
10. Ensuring good governance and stewardship through One Health approach for rational use of antimicrobials
11. Protection and restoration of ecosystems to support the health of human, animal, aquatic, plant and environment.

Chapter 3

The Strategic Framework

3.1 THE SCOPE

In the face of the increasing number of multidimensional health challenges that the world is facing, a shared vision of coherent and coordinated action on all levels is more important than ever. The new version of One Health Strategic Framework would provide a unique opportunity to take the partnership of the stakeholders to a new level to achieve the transformations required to mitigate the impact of current and future health challenges.

The scope of the Framework is guided by the imperative for an inclusive One Health approach to addressing the health threats of humans, animals and plants in an integrated and coordinated manner, while promoting environment and biodiversity protection and acknowledging the broader systems benefits of cross-sectoral collaboration to achieve collective outcomes.

Specifically, the Framework addresses the risks and consequences of emerging zoonotic diseases with epidemic and pandemic potential, endemic infectious diseases of zoonotic and vector-borne origin, food and water safety hazards, AMR and the health of the environment.

3.2 THEORY OF CHANGE

Theory of Change (ToC) of the Bangladesh One Health Strategic Framework (OHSF) recognizes the need of multisectoral coordinated action at national and subnational levels to achieve balanced and optimal health of humans, animals, plants and wider environment including ecosystems contributing to sustainable development in Bangladesh. It reduces the impact of pandemic, infectious diseases including zoonoses, AMR burden, ensures food safety and conserves environment and ecosystem health through a functional one health approach by improving evidence-based information generation and sharing, planning, early warning, surveillance and response capacities. The ToC of Bangladesh OHSF (2025-2030) is presented in Figure 15, and it aligns with the generic concept of ToC for One Health proposed by OHHLEP [20],

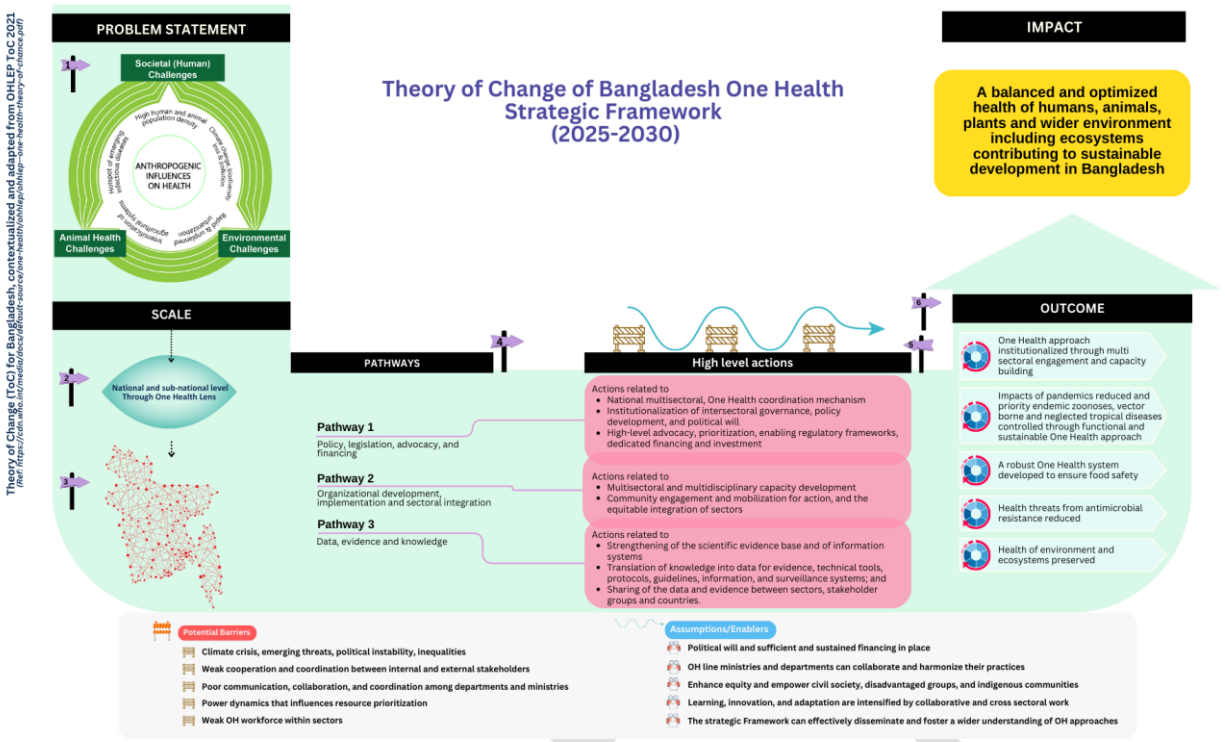


Figure 15: The Theory of Change of Bangladesh One Health Strategic Framework (2025-2030)

3.2.1 Vision (Impact)

The vision or expected impact of the Bangladesh One Health Strategic Framework (2024-2030) envisions a **balanced and optimized health of humans, animals, plants and wider environment including ecosystems contributing to sustainable development in Bangladesh.**

3.2.2 Problem statement

Anthropogenic influences on environment and planetary boundaries have a profound impact on the health and well-being of humans, animals, and the ecosystem we co-habit. Societal (human), animal and environmental challenges stem from inter-linked categories of human activities. Bangladesh is the worst victim of climate change, biodiversity loss and pollution. High population density, hotspot of emerging infectious diseases, intensification of agricultural systems, rapid and unplanned urbanization in Bangladesh further aggravated the health burden.

3.2.3 Scale

Bangladesh One Health Strategic Framework, 2025-2030 (OHSF, 2025-2030) will be implemented in human health, animal health, agriculture, fisheries, environment, wildlife and food sector at the national and sub-national level. One Health Secretariat (OHS) will work as nucleus of the system where top up committees like OH inter-sectoral technical committee, OH inter-Ministerial Steering committee and National OH Advisory Committee and top-down committees like divisional OH coordination committee, district OH coordination committee and Upazila OH coordination committee will work in collaboration to each other.

3.2.4 Pathways of Changes

One Health in Bangladesh exists in a vulnerable and complex institutional architecture of OH activities and initiatives. The action packages and activities, outputs are defined comprehensively to adhere to the three pathways of changes:

Pathway 1. Policy, legislation, advocacy, and financing:

This encompasses all aspects of a national multisectoral, One Health coordination mechanism for the institutionalization of intersectoral governance, policy development, political will expressed through high-level advocacy, prioritization, enabling regulatory frameworks, dedicated financing and investment. This also includes raising awareness of the One Health approach among all stakeholder groups.

Pathway 2. Organizational development, implementation and sectoral integration:

This includes all aspects of putting One Health into action, including multisectoral and multidisciplinary capacity development at national levels, community engagement and mobilization for action, and the equitable integration of sectors.

Pathway 3. Data, evidence and knowledge:

This comprises strengthening of the scientific evidence base and of information systems; translation of knowledge into data for evidence, technical tools, protocols, guidelines, information, and surveillance systems; and sharing of the data and evidence between sectors, stakeholder groups and countries.

3.2.5 Barriers and assumptions/ enablers

Both external and internal factors will influence achieving ToC outcomes of interest. To carry out prioritized activities and successfully implement the BOHSF potential barriers to change and options available to adapt to a constantly changing set of internal and external conditions have been identified.

Potential barriers:

- Climate crisis, emerging threats, political instability, inequalities.
- Weak cooperation and coordination between internal and external stakeholders
- Poor communication, coordination and collaboration among departments and ministries
- Power dynamics that influence resource prioritization.
- Weak OH workforce within sectors etc.

Assumptions/ Enablers:

- Political will and sufficient and sustained financing in place.
- OH line ministries and departments can collaborate and harmonize their practices.
- BOHSF 2024 will enhance equity and empower stakeholders including civil society, disadvantaged groups, and indigenous communities.

- Learning, innovation, and adaptation are intensified by collaborative and cross sectoral work.
- The strategic Framework can effectively disseminate and foster a wider understanding of OH approaches etc.

3.2.6 Strategic Outputs, action packages and activities

The expected strategic outputs, action packages and major activities are listed in the subsequent sections under each component of the OHSF 2025-2030

Details of the inputs required for undertaking the specific activities and achieving the stated objectives along with the timeline and implementing agencies have been listed in a supplementary document on the Costed Action Plan.

3.2.7 Outcomes

The strategic framework has identified long term and medium-term outcomes to be achieved through strategic outputs. These long-term outcomes are linked to six action tracks of Quadripartite One Health Joint Plan of Action (OH JPA). Achieving each long-term or high level outcome will involve realizing one or more intermediate outcomes. Each intermediate outcome will have the cumulative effect of several specific outputs and action packages that will be elaborated under different components of the Bangladesh One Health Strategic Framework. The long-term and intermediate outcomes of OHSF (2025-2030) are presented in Figure 16.

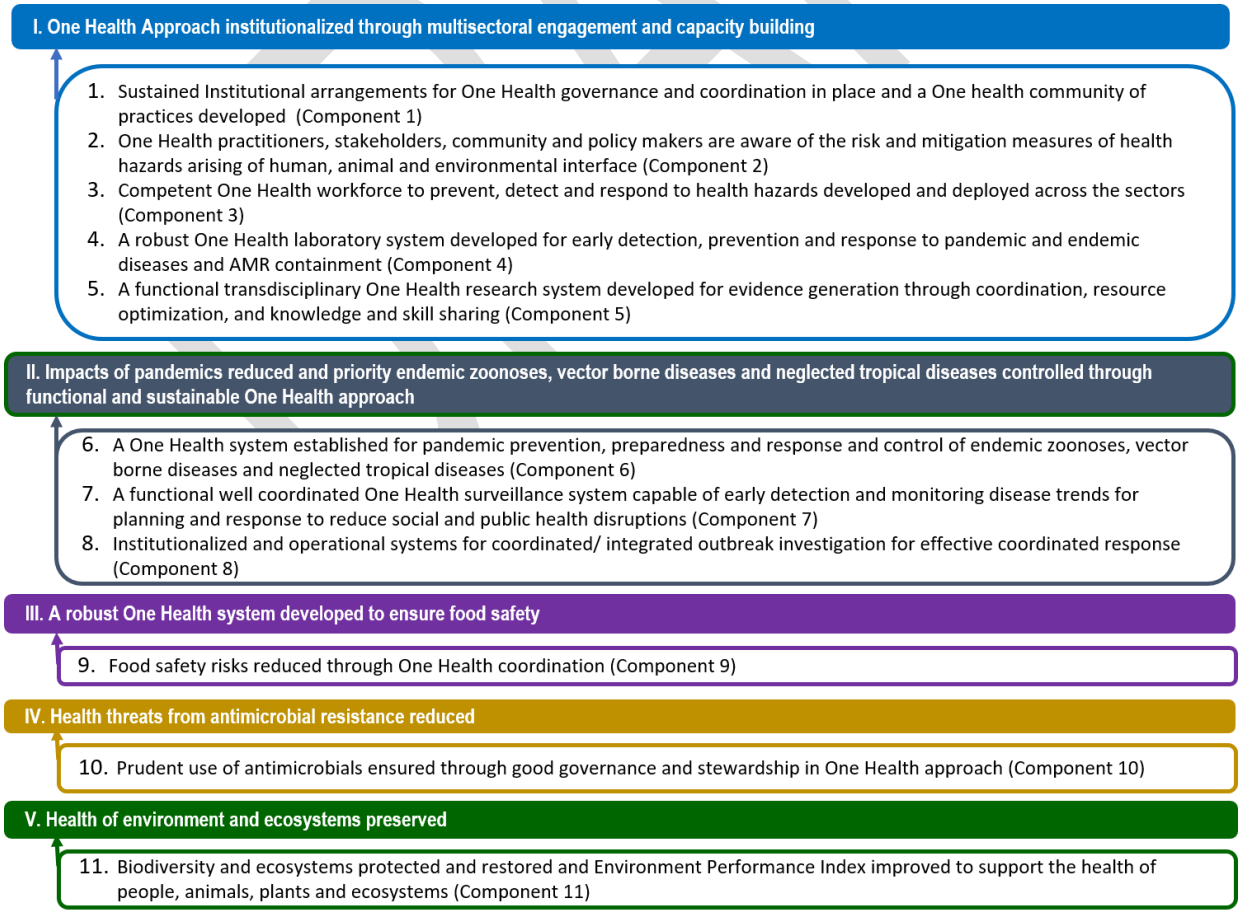


Figure 16: The long-term outcomes (roman numerals) and intermediate outcomes (arabic numerals) of Bangladesh One Health Strategic Framework (2025 – 2030)

3.3 COMPONENTS OF BANGLADESH ONE HEALTH STRATEGIC FRAMEWORK (2025 - 2030) AND THEIR ALIGNMENT WITH ONE HEALTH JOINT PLAN OF ACTION AND LONG-TERM OUTCOMES

Components of Bangladesh One Health Strategic Framework (2024 – 2030)	Long-term outcome	Corresponding Quadripartite OH JPA Action Track
Component 1: Governance, financing, coordination, networking and partnership	I. One Health Approach institutionalized through multisectoral engagement and capacity building	OH JPA Track 1: Enhancing One Health capacities to strengthen health systems
Component 2: Strategic communication and advocacy		
Component 3: Workforce development		
Component 4: Laboratory capacity building and networking		
Component 5: Transdisciplinary research		
Component 6: Pandemic prevention, preparedness and response and control of endemic zoonoses, vector borne diseases and neglected tropical diseases	II. Impacts of pandemics reduced and priority endemic zoonoses, vector borne diseases and neglected tropical diseases controlled through functional and sustainable One Health approach	OH JPA Track 2: Reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics OH JPA Track 3: Controlling and eliminating zoonotic, neglected tropical and vector-borne diseases
Component 7: Coordinated surveillance		
Component 8: Coordinated outbreak investigation		
Component 9: Food safety	III. A robust One Health system developed to ensure food safety	OH JPA Track 4: Strengthening the assessment, management and communication of food safety risks
Component 10: Antimicrobial resistance (AMR)	IV. Health threats from antimicrobial resistance reduced	OH JPA Track 5: Curbing the silent pandemic of AMR

Component 11: Health of Environment	V. Health of environment and ecosystems preserved	OH JPA Track 6: Integrating the environment into One Health

Bangladesh One Health Strategic Framework (2025-2030) has 11 components. The components are aligned with the Quadripartite OH JPA Action Tracks and Long-term outcomes. The components are as follows:

3.4 COMPONENT-WISE STRATEGIC OUTPUTS, ACTION PACKAGES AND ACTIVITIES

Component 1: Governance, Financing, Coordination, Networking and Partnership

Establishment of OHS and One Health oversight committees was a milestone decision for institutionalization of One Health in Bangladesh. However, the OHS and oversight committees are not fully functional. OHS suffers from the scarcity of financial and non financial resources and the lack of convening power further complicates the situation. The oversight and functional coordinating mechanism not yet fully engaged all relevant stakeholders and is not extended to subnational level where it is critical for achieving OH targets.

As elsewhere in the world, the GOB budget is allocated to the ministry and a clear mechanism of cost sharing for OHS and functional coordination is yet to be defined. Despite continuous advocacy, strong political and policy support is still lacking for garnering support for a well resourced multisectoral coordination mechanism. There is a necessity to make investments in One Health more appealing to both the public and private sectors. This can be addressed by emphasizing the potential returns on investment, which should account for both financial gains and social benefits. Also, demonstrating societal benefits of the One Health approach to policy makers will help in influencing public and private investment. OH Community of Practice developed organically can influence the government and can also complement government efforts through effective networking and partnership of the relevant stakeholders.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 1 are described below:

Long-term Outcome:

I. One Health Approach institutionalized through multisectoral engagement and capacity building

Intermediate Outcome:

1. Sustained Institutional arrangements for One Health governance and coordination in place and a One Health community of practices developed

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. One Health governance and coordination strengthened	1.1 Develop a legal framework for One Health updating or enacting new laws, rules and regulations	1.1.1 Reviewing of existing law that influences One Health
		1.1.2 Enacting new law or framing regulation under existing law for One Health
	1.2 Strengthen and expand One Health governance mechanism from central to sub-national levels with the involvement of the key stakeholders	1.2.1 Formation of the following One Health governance, technical and coordination bodies from national to the sub-national level: ● National One Health Advisory Committee

		• One Health Inter-ministerial Steering Committee • One Health Intersectoral Technical Committee • One Health Secretariat Coordination Committee • Divisional One Health Co-ordination Committee • District One Health Co-ordination Committee • Upazila One Health Co-ordination Committee
	1.3 To strengthen One Health Secretariat	1.3.1 Developing an organogram for the One Health Secretariat
		1.3.2 Ensuring secondment of Technical Officers from the core departments (Health, Livestock, Forest, Environment, Fisheries, Agriculture and BFSA), as well as a senior Coordinating Officer from the technical agency of the lead ministry.
		1.3.3 Create Administrative Officer, IT personnel and other support staff positions at One Health Secretariat as per organogram
2. Financing for One Health ensured	2.1 To establish a mechanism for collaborative financial planning for One Health programmes	2.1.1 Development of a national One Health investment plan
		2.1.2 Inclusion of One Health activities in the budget plan of the respective sector programs/ 5-year plan of major stakeholders and development of an economic code for One Health
		2.1.3 Development of a mechanism of inter-ministerial collaborative planning and resource mobilization for One Health
3. Effective One Health networking and partnership developed	3.1 To develop a functional network and partnership of One Health stakeholders	3.1.1 Building partnership with UN agencies, donors, NGOs, private sector and other philanthropic organizations
	3.2 To strengthen One Health University Network	3.2.1 Institutionalization of Bangladesh One Health University Network
		3.2.2 Establishing collaboration with regional and international One Health University Networks

	3.3 To improve One Health information sharing	3.3.1 Developing a platform for One Health information sharing and its operational mechanism
		3.3.2 Regular publication of One Health Bulletin
	3.4 Promote One Health concepts in professional and civil society platforms	3.4.1 Support OH related activities of "One Health Bangladesh" and other professional and civil society platforms
		3.4.2 Developing/ strengthening One Health Youth or Students' forum
4. Regional One Health collaboration established	4.1 Develop networking and collaboration with international and regional forums on One Health	4.1.1 Dialogue with international, regional and other national forums on One Health to foster collaboration
		4.1.2 Supporting the development of regional programmes on One Health
5. One Health monitoring and evaluation system developed	5.1 Develop a One Health M&E framework	5.1.1 Reviewing One Health M&E tools available locally and globally
		5.1.2 Developing M&E plan, tools and guidelines appropriate for Bangladesh
		5.1.3 Conducting M&E according to the developed framework

One Health Governance and Coordination Structure:

One Health requires a structured approach for effective coordination, involving a broad and diverse stakeholders. A multi-tier governance and coordination structure will be developed from the national to sub-national level. The One Health Secretariat will provide secretarial services to all tiers. The core sectors of One Health in Bangladesh and the governance and coordination structure is presented in Figure 17. All committees will include representatives from all the core sectors. Other relevant stakeholders will be engaged as required.

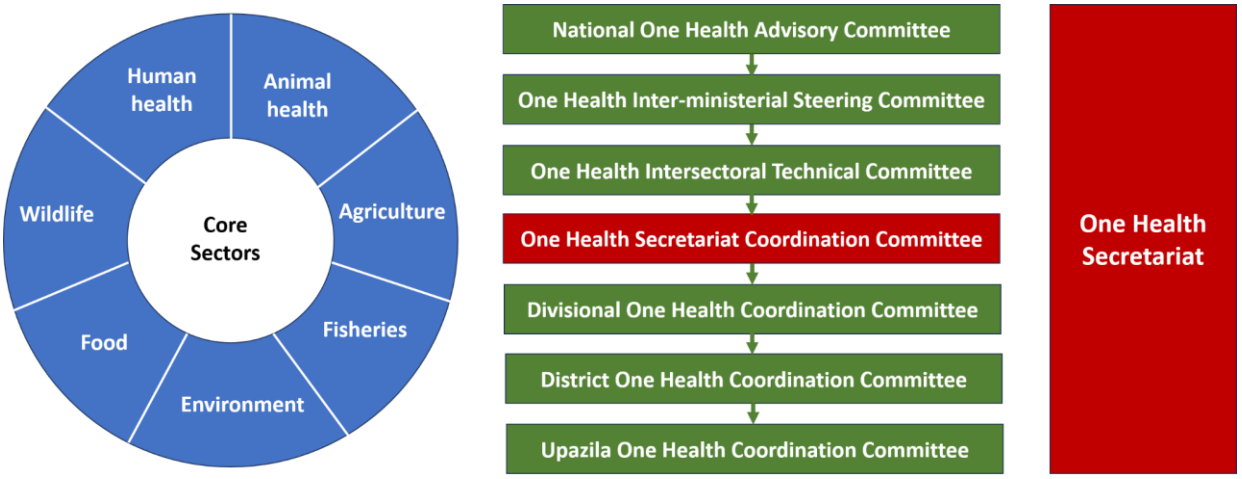


Figure 17: One Health Core Sectors and the Governance and Coordination Structure

The core sectors for One Health in Bangladesh are human health, animal health, wildlife, agriculture, fisheries, food, and environment under the Ministry of Health and Family Welfare (MoHFW), Ministry of Fisheries and Livestock (MoFL), Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Agriculture (MoA) and Ministry of Food (MoFood). Hence, the respective ministries and departments will be actively engaged in One Health governance and coordination at different tiers. Other relevant stakeholders like One Health experts, representatives of One Health Bangladesh, academia and research organizations, other relevant ministries, UN organizations and other development partners will also be engaged in different committees as per requirement.

The Central One Health Coordination Committee (Director level committee) will be responsible for routine coordination of One Health activities in Bangladesh under the guidance and advice of One Health Intersectoral Technical Committee (Director General or Chairman level committee), One Health Inter-ministerial Steering Committee (Secretary level committee) and National One Health Advisory Committee (Minister level committee). The National One Health Coordination Committee will also facilitate and monitor One Health coordination at sub-national levels through Divisional, District and Upazila One Health Coordination Committees.

The One Health Secretariat will provide all secretarial support for One Health governance and coordination and will work under direct guidance and supervision of the National One Health Coordination Committee. The office of the One Health Secretariat is located at IEDCR.

The leadership of One Health governance and coordination at all tiers will rotate among the core ministries (MoHFW, MoFL, MoEFCC, MoA and MoFood) every two years.

The composition of different governance and coordination committees will be as follows:

(1) National One Health Advisory Committee -

- Honourable Minister, Ministry of Health and Family Welfare
- Honourable Minister, Ministry of Fisheries and Livestock
- Honourable Minister, Ministry of Environment Forest and Climate Change
- Honourable Minister, Ministry of Agriculture
- Honourable Minister, Ministry of Food
- One Health Expert (to be co-opted)

On invitation:

- Representatives of other relevant ministries
- Coordinator, One Health Bangladesh
- Representatives of UN Technical agencies (FAO, UNEP, UNICEF, WHO)
- Representatives of development partners

(2) One Health Inter-ministerial Steering Committee

- Secretary (Health Services), Ministry of Health and Family Welfare
- Secretary, Ministry of Fisheries and Livestock
- Secretary, Ministry of Environment Forest and Climate Change
- Secretary, Ministry of Agriculture
- Secretary, Ministry of Food
- One Health Expert (to be co-opted)

On invitation:

- Representatives of other relevant ministries
- Coordinator, One Health Bangladesh
- Representatives of UN Technical agencies (FAO, UNEP, UNICEF, WHO)
- Representatives of development partners

(3) One Health Intersectoral Technical Committee

- Director General, Directorate General of Health Services
- Director General, Department of Livestock Services
- Chief Conservator of Forest, Bangladesh Forest Department
- Director General, Department of Environment
- Director General, Department of Agriculture Extension
- Director General, Department of Fisheries
- Director General, Directorate General of Drug Administration
- Chairman, Bangladesh Food Safety Authority
- Coordinator, One Health Bangladesh
- An academician with OH expertise (to be co-opted)
- A researcher with OH expertise (to be co-opted)

On invitation:

- Representatives of UN Technical agencies (FAO, UNEP, UNICEF, WHO)
- Representatives of development partner

(4) One Health Secretariat Coordination Committee

- Director, Institute of Epidemiology Disease Control and Research (IEDCR), DGHS
- Director, Disease Control, DGHS
- Director, Administration, Department of Livestock Services
- Director, Directorate General of Drug Administration
- Conservator of Forest, Wildlife and Natural Conservation Circle, Bangladesh Forest Department

- Director/PSO (Fish Inspection and Quality Control), Department of Fisheries
- Director, Natural Resource Management, Department of Environment
- Member, Public Health and Nutrition, Bangladesh Food Safety Authority
- Director, Plant Protection, Department of Agriculture Extension

On invitation:

- One Health Expert(s)
- Representatives of One Health Bangladesh
- Representatives of UN Technical agencies (FAO, UNEP, UNICEF, WHO)
- Representatives of development partners

(5) Divisional/ District/ Upazila One Health Coordination Committee

Divisional/ District/ Upazila Officers of Health Services, Department of Livestock Services, Bangladesh Forest Department, Department of Agriculture Extension, Department of Fisheries, Department of Environment, and Bangladesh Food Safety Authority

One Health Secretariat

A Senior Coordinating Officer of One Health Secretariat will be deputed from the agency under the lead ministry.

In addition, Technical Officers, one each, will be seconded from the Directorate General of Health Services, Department of Livestock Services, Bangladesh Forest Department, Department of Environment, Department of Agriculture Extension, Department of Fisheries, and Bangladesh Food Safety Authority.

The support staff, such as Administrative Officer, IT personnel, Office Assistant and other Support Staff of the One Health Secretariat will be recruited as per organogram.

The Terms of Reference of different committees and One Health Secretariat are given in Appendix 3 which might be further elaborated and refined depending on the context and need.

Component 2: Strategic Communication and Advocacy

The success of OH initiatives largely depends on strategic communication and advocacy for engaging community and influencers. A mechanism of effective and timely communication of hazards and risks arising at human, animal and environmental interface, and their mitigation measures to the OH professionals and communities is crucial for addressing OH challenges. Bangladesh needs to develop and implement a OH Communication Strategy and community engagement programmes. Additionally, OH advocacy should be a regular process considering frequent turnover at policy level.

The long term outcome, intermediate outcome, strategic outputs, action packages and activities of Component 2 are described below:

Long-term Outcome:

I. One Health approach institutionalized through multisectoral engagement and capacity building

Intermediate outcome:

2. One Health practitioners, stakeholders, community and policy makers are aware of the risk and mitigation measures of health hazards arising of human, animal and environmental interface

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	Action package	Activity
1. One Health strategic communication improved	1.1 Develop a One Health Communication and Community Engagement Strategy	1.1.1 Reviewing existing communication strategies relevant to One Health (Risk communication, SBCC and Advocacy)
		1.1.2 Developing a dedicated One Health Communication and Community Engagement Strategy
	1.2 To build communication capacity of key stakeholders	1.2.1 Development of ToT modules and materials for capacity building training on strategic communication
		1.2.2 Conducting capacity building training and workshops on strategic communication for key stakeholders
	1.3 Develop and implement One Health communication and community engagement programmes	1.3.1 Identifying priority areas and approaches for One Health communication and community engagement
		1.3.2 Developing specific communication materials for social and behavioral change and community engagement

		1.3.3 Development and implementation of coordinated priority One Health communication and community engagement programs
2. One Health advocacy strengthened	2.1 Develop and implement One Health advocacy programmes	2.1.1 Developing advocacy packages on key One Health issues for policy makers, political and opinion leaders
		2.1.2 Organizing advocacy meetings and dialogues with policy makers, political and opinion leaders at national and sub-national level
		2.1.3 Documentation and dissemination of evidences, examples of good practices, and success stories

Component 3: Workforce Development

The lack of mapping and strategic planning of OH workforce in all relevant sectors is a major gap that requires formulation of a multisectoral OH workforce strategy. The strategy will guide to strengthen, expand and mainstream FETPs and other OH field training programs, and OH continuing education. In addition it will help to develop OH diplomas and incorporate OH content in existing medical, veterinary, environmental sciences and other relevant curricula. The multisectoral One Health workforce strategy will guide proper deployment of OH professionals and their career path for best utilization of investment in workforce development.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 3 are described below:

Long-term Outcome:

I. One Health approach institutionalized through multisectoral engagement and capacity building

Intermediate Outcome:

3. Competent One Health workforce to prevent, detect and respond to health hazards developed and deployed across the sectors

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. One Health workforce plan developed	1.1 Develop One Health Workforce Strategies	1.1.1 Need assessment of OH human resources in all sectors
		1.1.2 Develop sectoral and national OH workforce strategies
2. One Health education strengthened	2.1 Incorporate OH concept in the undergraduate medical, veterinary, wildlife biology, agriculture, fisheries, food safety, and environmental science/health curriculum	2.1.1 Mapping OH contents in the existing undergraduate curriculum
		2.1.2 Design or update contents for the OH modules/courses for undergraduate curriculum
		2.1.3 Advocacy with statutory bodies and University academic bodies for curriculum revision
	2.2 To introduce OH education at postgraduate level	2.2.1 Need assessment for One Health education
		2.2.2 Development of OH modules for existing postgraduate programmes

		2.2.3 Development of Diploma or Masters programme on OH
		2.2.4 Development of teachers' pool with OH expertise and pedagogical skills
		2.2.5 Fellowship for OH postgraduate studies
		2.2.6 Faculty and student exchange programmes
3. In-service training and continuing education strengthened	3.1 Internalize Field Epidemiology Training programmes (eg., FETPs, FETPV), and Field Training Programme for Wildlife, Environment, Biodiversity and Ecosystem (FTP-WEBE) to Government workforce development Programs	3.1.1 Assessment of transition status of FETPs to GOB programs
		3.1.2 University affiliation of FETPs where required
		3.1.3 Start FTP-WEVE for staffs of BFD and DoE
		3.1.4 Financial resource planning for FETPs and FTP-WEBE and their inclusion in sectoral budgets
		3.1.5 Review and update the contents/modules of FETPB, FETPV, FTP-WEBE, and ensure that contents of common OH approaches are included in all the three curricula
	3.2 To provide in-service training on OH	3.2.1 Assessment of OH training needs for all sectors and all tiers
		3.2.2 Development of training modules
		3.2.3 Developing trainers pool from all sector
		3.2.4 Incorporating the OH training modules within in-service training plan of all sectors
		3.2.5 Financial resource planning OH training programmes in sectoral budgets
4. One Health workforce deployed at right places	4.1 To ensure deployment of adequate OH workforce in all sectors	4.1.1 Gap analysis of OH workforce for each sector and identification of critical OH workforce for public health, terrestrial and aquatic animal health, environmental health, food safety and AMR
		4.1.2 Deployment of critical OH workforce on priority basis
		4.1.3 Planning for further OH workforce deployment
	4.2 To develop career path for OH workforce	4.2.1 Development and implementation of a Career Path Plan for OH workforce in each sector

	4.3 To strengthen staffing of OH Secretariat	4.3.1 Development of an organogram for One Health Secretariat
		4.3.2 Creation of necessary posts and recruitment
		4.3.3 Training for One Health Secretariat staff

Component 4: Laboratory Capacity Building and Networking

Strong, sustained and state-of-the-art laboratory capacity is indispensable for rapid diagnosis, early warning and reducing the impact of pandemic and endemic diseases. Assessment-based capacity building with sustained flow of funding and deployment of appropriate human resources will help sustain and improve early detection capacity across the sectors. Establishment of laboratory referral systems and networks within and across the sectors with specific mandates will streamline sample flow and optimize the limited resources for best results. Improvement of the laboratory quality control and quality assurance, laboratory biosafety and biosecurity, laboratory management system will ensure better and sustainable laboratory services. In addition, strategies for retention of laboratory personnel will assist in sustainability and quality assurance.

The long-term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 4 are described below:

Long-term Outcome:

I. One Health approach institutionalized through multisectoral engagement and capacity building

Intermediate Outcome:

4. A robust One Health laboratory system developed for early detection, prevention and response to pandemic and endemic diseases and AMR containment.

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. Functional laboratory network established	1.1 Develop functional laboratory networks within and across the sectors	1.1.1 Updating National Laboratory Strategy
		1.1.2 One Health laboratory system mapping for networking, collaboration and resource optimization
		1.1.3 Identification of scopes and development of guidelines for laboratory network within and across the sectors
		1.1.4 Developing guidelines and protocols for sample collection, transportation and specimen referral
		1.1.5 Review the current status of laboratory data sharing and develop a system of data sharing in the laboratory network within and across the sectors
2. Laboratory diagnostic capacity enhanced	2.1 To strengthen laboratories at national and sub-national levels for	2.1.1 Identification of national reference laboratories with clear mandate in each sector

	advanced molecular techniques and routine tests	
		2.1.2 Providing necessary laboratory equipment to national reference laboratories in each sector based on gap assessment
		2.1.3 Technical capacity building at national level for metagenomic analysis to detect novel pathogens
		2.1.4 Establishment/ strengthening of wildlife disease diagnostic and research laboratories
		2.1.5 Establishment/ strengthening sub-national regional laboratories with defined mandate under the laboratory network
		2.1.6 Regular training and mentoring on routine laboratory diagnosis for staff at sub-national regional laboratories
		2.1.7 Providing necessary equipment and manpower to sub-national laboratories
		2.1.8 Ensuring regular maintenance of equipment, supply of consumables and reagents
		2.1.9 Establishment/ strengthening of biomedical engineering support to laboratories in each sector
3. Laboratory biosafety and biosecurity improved	3.1 To ensure laboratory biosafety and biosecurity at all levels	3.1.1 Developing/updating national laboratory biosafety and biosecurity guideline
		3.1.2 Developing/updating biosafety and biosecurity SOP for each laboratory
		3.1.3 Regular training on laboratory biosafety and biosecurity
4. Quality of laboratory services assured	4.1 To develop a functional laboratory quality assurance system	4.1.1 Regular calibration, testing and certification of laboratory equipment
		4.1.2 Installation of laboratory information management system
		4.1.3 Developing proper specimen management system
		4.1.4 Laboratory assessment at regular intervals
		4.1.5 Accreditation of selected laboratories
		4.1.5 Developing QC and QA plan including regular proficiency testing (for national labs by international reference lab and for sub-national labs by national labs)
		4.1.6 Capacity building for in-house/in-country production of laboratory reagents, primers, probes, etc.)

Component 5: Transdisciplinary Research

Evidence-based solutions to OH problems require transdisciplinary research to generate data and evidence. Research on OH related problems are siloed at different universities and research institutes, and the number of transdisciplinary research is meagre. Developing a strategic plan and mobilization of resources for transdisciplinary research on OH through the engagement of national research coordination bodies, universities and research institutes, government executing agencies, private sectors and development partners will be an immediate action to implement under this strategy. The strategy will promote dissemination of research findings and translating those into action through scientific seminars and advocacy meetings, etc.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 5 are described below:

Long-term Outcome:

I. One Health approach institutionalized through multisectoral engagement and capacity building

Intermediate Outcome:

5. A functional transdisciplinary One Health research system developed for evidence generation through coordination, resource optimization, and knowledge and skill sharing.

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	Action package	Activity
1. Transdisciplinary research on One Health promoted	1.1 Develop a mechanism of collaborative planning and resource mobilization for transdisciplinary research on One Health	1.1.1 Identifying the opportunities of transdisciplinary research
		1.1.2 Preparing a lists of priority areas for transdisciplinary research in One Health in the fields of pandemic PPR, epidemiology and disease control, food safety, AMR, and biodiversity and the health of environment and ecosystem
		1.1.3 Planning resource mobilization to support One Health research involving national and international agencies
	1.2 Encourage institutional collaboration within the country and internationally	1.2.1 Stakeholder consultation to identify the scopes of collaboration between national institutes for transdisciplinary research in One Health
		1.2.2 Exploring opportunities of international collaboration, visits and

		fellowships for transdisciplinary research in One Health
2. Translation of research findings into actions and policies	2.1 Support regular dissemination of research findings	2.1.1 Organizing conferences, seminars and meetings for dissemination of research findings
		2.1.2 Archiving research publications on One Health
		2.1.3 Publishing One Health bulletins incorporating research findings
	2.2 Facilitate the utilization of research findings	2.1.1 Advocacy with policy makers for utilization of research findings in policy formulations and interventions

Component 6: Pandemic Prevention, Preparedness and Response, and Control of Endemic Zoonoses, Vector Borne Diseases and Neglected Tropical Diseases

Pandemic prevention, preparedness and response (Pandemic PPR) is a core issue in OH approach. Because of the zoonotic origin of most of the pandemic diseases, it is crucial to prevent at source, i.e, preventing zoonotic spillover at human- animal- wildlife- environment interfaces by addressing the root causes of zoonotic diseases, such as encroachment of wildlife habitat, wildlife trade, and risky farming practices. Monitoring, inspection and certification of farm, companion and wild animal trade, reducing human-wildlife conflict at interfaces, and undertaking preemptive measures for good farming practices, disease reporting, animal movement control and vaccination can contribute to the prevention of zoonotic spillover. Apart from this, strategic focus also should be on multisectoral preparedness for responding to any future pandemic. In the Quadripartite One Health Joint Plan of Action special attention has been paid to the control of endemic zoonoses, vector borne diseases and neglected tropical diseases. Prioritization of zoonotic diseases was done in 2017. Bangladesh will revisit the priority of zoonotic diseases including endemic zoonoses and emerging zoonotic diseases since the context has been changed. Considering the high burden of vector borne and neglected tropical disease, Bangladesh will take actions to reduce the burden using the lessons learned from elimination of some neglected tropical diseases in the country such as visceral leishmania (Kala azar) and Lymphatic Filariasis.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 6 are described below:

Long-term Outcome:

II. Impacts of pandemics reduced and priority endemic zoonoses, vector borne diseases and neglected tropical diseases controlled through functional and sustainable One Health approach

Intermediate Outcome:

6. A One Health system established for pandemic prevention, preparedness and response and control of endemic zoonoses, vector borne diseases and neglected tropical diseases

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. Potential pandemics prevented at source (stop zoonotic spillover)	1.1 Assess the risks of zoonotic spillover from livestock and wildlife (including environmental and behavioral risks)	1.1.1 Risk analysis for drivers of zoonotic spillover and risk mapping for spillover of potential pandemic zoonotic pathogens
	1.2 Reduce the risks of zoonotic spillover from farm, companion and wild animal	1.2.1 Development of a plan for risk mitigation for animal diseases of pandemic potential

		1.2.2 Strengthening animal health regulatory capacity including farm, companion and wild animal animal health monitoring, reporting, and certification system
		1.2.4 Development of guidelines and standards for farm biosecurity
		1.2.5 Development and use of biosecurity compliance monitoring tools, and enforcement
		1.2.6 Developing guideline and SOP for wildlife handling and rules, regulation and monitoring system for wildlife trade and movement
2. Priority endemic zoonoses prevented, controlled or eliminated	2.1 Develop and implement programme for vaccination at source against priority endemic zoonotic diseases (e.g., Rabies, Anthrax) through OH coordination	2.1.1 Prioritizing endemic zoonotic diseases for control or elimination
		2.1.2 Developing and implementing disease-specific vaccination plan for priority zoonotic diseases
3. Important vector borne diseases and neglected tropical diseases controlled	3.1 Develop strategic plans and implement control measures against priority vector borne diseases and neglected tropical diseases through OH coordination (e.g., Dengue, TB)	3.1.1 Prioritizing vector borne diseases and neglected tropical diseases for control
		3.1.2 Developing/ updating disease-specific control strategy for priority vector borne diseases and tropical neglected diseases
		3.1.3 Implementing the programmes for the control of priority vector borne diseases and neglected tropical diseases through OH coordination
4. Preparedness enhanced for potential pandemics	4.1 Develop /update Pandemic Preparedness and Response Plan	4.1.1 Develop/update Pandemic Preparedness and Response Plan for Respiratory pathogens
		4.1.2 Developing/ updating Public Health Emergency Preparedness and Response Plan
		4.1.3 Implementing Public Health Emergency Preparedness and Response Plan
		4.1.4 Developing/updating multi-hazard action plan based on Public Health Emergency Preparedness and Response Plan
		4.1.5 Implementing multi-hazard action plan based on Public Health Emergency Preparedness and Response Plan

		4.1.6 Development of relevant operational guidelines and SOPs
	4.2 Strengthen quarantine and isolation capacity for public health emergencies	4.2.1 Establishment/strengthening of quarantine and isolation facilities
		4.2.2 Strengthening of Infectious diseases hospitals including IHR designated hospitals
		4.2.3 Developing/updating guidelines and SOPs for the operation of quarantine and isolation facilities and IHR designated hospitals
	4.3 Strengthen the technical capacity at the PoEs and animal (domestic and wildlife) quarantine stations	4.3.1 Developing/ updating guidelines and SOPs for PoEs and animal (domestic and wildlife) quarantine stations
		4.3.2 Joint Technical capacity building of the staffs at PoE for human and animal (domestic and wildlife) quarantine stations aligning with the workforce capacity building efforts
5. Pandemic response capacity strengthened	5.1 Establish/ strengthen Public Health Emergency Operation Centres (EOCs) and ensure coordination across the sectors	5.1.1 Mapping of existing EOCs across the sectors at all levels
		5.1.2 Establishing/strengthening EOCs across relevant sectors at different levels (national and sub-national)
		5.1.3 Development of organogram, operational guidelines and SOPs for EOCs
		5.1.4 Development of networking and a coordination mechanism among the EOCs of the relevant sectors through One Health Secretariat
		5.1.5 Technical capacity building of EOCs including training and simulation exercise
	5.2 Develop surge capacity for responding to Public Health Emergencies	5.2.1 Developing of a surge response plan including protocol for public health emergencies
		5.2.2 Surge capacity building (training and simulation exercise) for public health emergencies
	5.3 Strengthen capacity for infection prevention and control (IPC) and Hospital Acquired Infection (HAI)	5.3.1 Establishing/strengthening of HAI surveillance
		5.3.2 Strengthening health care facilities for rapid diagnosis and case management in public health emergencies

		5.3.3 Capacity building and activating the IPC committees at all health facilities (both public and private)
		5.3.4 Awareness building of healthcare providers and recipients
		5.3.5 Building and maintaining logistics stockpiles
		5.3.6 Vaccine Contingency/ deployment plan for diseases of pandemic potential

Component 7: Coordinated Surveillance

Developing a functional OH early warning system powered by sectoral as well as integrated digital platforms for routine disease reporting and epidemiological analysis remains a top priority to reduce the impact of pandemic and endemic diseases. Coordinated or integrated disease surveillance in OH approach has been discussed for quite some time but a strategy and action plan for coordinated or integrated surveillance is yet to be developed. This would require mapping of the existing surveillance capacity and gaps in public health and animal health sectors. Coordination and cross-sectoral integration of routine passive surveillance, event-based active surveillance, community-engaged participatory disease surveillance as well as environmental surveillance will be implemented. A functional surveillance data sharing platform linked with OH early warning system will be developed.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 7 are described below:

Long-term Outcome:

II. Impacts of pandemics reduced and priority endemic zoonoses, vector borne diseases and neglected tropical diseases controlled through functional and sustainable One Health approach

Intermediate Outcome:

7. A functional well coordinated One Health surveillance system capable of early detection and monitoring disease trends for planning and response to reduce social and public health disruptions

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. One Health coordinated/integrated surveillance strengthened	1.1 Establish OH coordinated/ integrated surveillance system at human, animal- and environment sectors, and at interfaces	1.1.1 Reviewing and updating the list of zoonoses of pandemic potentials, endemic zoonoses, neglected tropical and vector borne diseases that require coordinated surveillance
		1.2.1 Mapping of stakeholders for coordinated/integrated surveillance and assessment of surveillance capacities
		1.2.2 Developing coordinated/ integrated surveillance strategy and plan for priority diseases
		1.2.3 Developing relevant SOPs

		1.2.4 Mobilizing joint resource for coordinated/ integrated surveillance
		1.2.5 Implementation of coordinated/ integrated surveillance at human, animal, environment sectors and at interfaces
		1.2.6 Joint OH capacity building training on coordinated/ integrated surveillance
2. Early warning system developed	2.1 Develop a coordinated/ integrated disease reporting and early warning system	2.1.1 Establishing/revamping of event-based surveillance at all OH relevant sectors
		2.1.2 Establishing horizon scanning for disease detection
		2.1.3 Establishing environmental surveillance of endemic/epidemic-prone diseases
		2.1.4 Developing/ strengthening functional digital platforms (for human health,terrestrial and aquatic animal health, wildlife and environment sectors and for common interfaces) for disease reporting and early warning
		2.1.5 Developing a OH disease reporting and early warning system integrating human health, terrestrial and aquatic animal healthand wildlife sector platforms relying on block-chain technology and artificial intelligence
		2.1.6 Epidemiological capacity building for data analysis, modeling, disease reporting and early warning in each sector
3. Participatory zoonotic disease surveillance strengthened through OH coordination	3.1 Develop participatory disease surveillance (PDS) systems for priority zoonotic diseases	3.1.1 identifying priority zoonotic diseases, target communities and sites for PDS
		3.1.2 Developing/adopting PDS tool kit
		3.1.3 Building technical capacity across the sectors for conducting PDS
		3.1.4 Conducting PDS for priority zoonotic diseases by multisectoral teams
4. Surveillance information shared at real-time	4.1 Develop/ strengthen real-time surveillance Information sharing mechanism	4.1.1 Developing protocol for sharing surveillance data between the sectors at real time

		4.1.2 Policy level advocacy and sensitization, and identifying focal point from each sector
		4.1.3 Strengthening the capacity of OHS on information management
		4.1.4 Updating OH dashboard for event-based surveillance and linking it with OH disease reporting and early warning system

Component 8: Coordinated Outbreak Investigation

Bangladesh has limited experiences of coordinated outbreak investigation on Anthrax, and Nipah. The practice of coordinated outbreak investigation will be mainstreamed, in particular, for diseases or events having the likelihood of spillover or spill back. The joint/coordinated outbreak investigation will be expanded to investigate disease X, i.e., a disease of unknown etiology. The government will develop mechanisms to facilitate coordinated and integrated outbreak investigation.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 8 are described below:

Long-term Outcome:

II. Impacts of pandemics reduced and priority endemic zoonoses, vector borne diseases and neglected tropical diseases controlled through functional and sustainable One Health approach

Intermediate Outcome:

8. Institutionalized and operational systems for coordinated/ integrated outbreak investigation for effective coordinated response

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	**Action package**	**Activity**
1. Coordinated outbreak investigation strengthened	1.1 Establish OH outbreak investigation and response mechanism	1.1.1 Developing OH outbreak investigation and response strategy, manual, and SOPs
		1.1.2 Reorganization of OH Rapid Response team (RRT) at all levels (national, district and upazila)
		1.1.3 Building technical capacity (training, simulation exercise etc.) of OH RRT
	1.2. Establish a OH Lab and Epi network	1.2.1. Networking among different laboratories (including public and private) and epidemiology institutes/centres across the sectors
		1.2.2 Developing operational guidelines for Lab and Epi network

	1.3.. Develop a legal framework for coordinated/joint outbreak investigation	1.3.1.. Reviewing and updating existing legislations for coordinated/joint outbreak investigation
		1.3.2 Issuance of administrative standing order for coordinated/joint outbreak investigation
		1.3.3 Joint resource planning to allocate funds for coordinated outbreak investigation and response
	1.4 Build technical capacity for coordinated/joint outbreak investigation and response	1.4.1 Development of SOPs for coordinated/joint outbreak investigation and response
		1.4.2 Joint training for technical capacity building for coordinated/joint outbreak investigation and response

Component 9: Food Safety

Food safety risks could arise along the whole value chain from farm to plate. A large number of stakeholders are involved requiring OH coordination and response. A robust system of food safety governance with effective coordination at all levels is required. Bangladesh will develop One Health mechanisms for surveillance, hazard identification, risk analysis, risk mitigation, community awareness and engagement for ensuring food safety. Additionally, Bangladesh will develop systems for preparedness and response through OH coordination in the event of a food safety emergency.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 9 are described below:

Long-term Outcome:

III. A robust One Health system developed to ensure food safety

Intermediate Outcome:

9. Food safety risks reduced through One Health coordination

Strategic Outputs, Action Packages and Activities:

Key Strategic Output	Action package	Activity
1. Food safety governance institutionalized and coordinated	1.1 Update food safety legislations and rules, policy guidelines and action plans	1.1.1 Reviewing Food Safety Act 2013 and other acts of different ministries relevant to food safety
		1.1.2 Reviewing, updating or developing food safety rules and regulations
		1.1.3 Development of food safety policies, strategies and action plans
		1.1.4 Reviewing, updating, adoption, harmonization and development of Food Standards
	1.2 Ensure coordination in food safety governance addressing gaps and overlaps	1.2.1 Identification of gaps and overlaps in food safety governance of different sectors along the food chain
		1.2.2 Ensuring effective coordination of food safety governance across the sectors under the leadership by BFSA (Bangladesh Food Safety Authority)
	1.3 Institutionalize a system for analyzing food safety hazards and risks	1.3.1 Development of a plan for routine food safety hazard and risk analysis across the food/value chain
		1.3.2 Identification of stakeholders in food safety hazard and risk analysis

		1.3.3 Developing/updating of a mechanism and protocol for routine food safety hazard and risk analysis
2. Good food production practices ensured for food safety	2.1 Promote good practices in animal production, aquaculture and agricultural practices to ensure food safety	2.1.1 Developing/ updating guidelines and standards of good animal production practices, good aquaculture practices and good agricultural practices for food safety (at production, harvesting, transportation, marketing, primary processing/ slaughtering)
		2.1.2 Regulatory capacity building at respective departments for monitoring the compliance of food safety guidelines and standards in animal production, aquaculture and agriculture
		2.1.3 Routine monitoring and certification of food safety compliance in animal production, aquaculture and agriculture
3. Good manufacturing practices ensured for food safety	3.1 Ensure good practices in processing and manufacturing of food products	3.1.1 Monitoring the compliance of good manufacturing practices (GMP), hazard analysis and critical control points (HACCP) principles and Food Safety Standards in the manufacturing and marketing of processed food items
		3.1.2 Ensuring traceability of processed/marketed food items
4. A coordinated food safety laboratory analysis network developed across the sectors	4.1 Establish laboratory network and build capacity for food safety analysis	4.1.1 Mapping and assessment of the food safety laboratories across the sectors
		4.1.2 Developing a network of food safety laboratories for effective collaboration based on capacities and defined mandates
		4.1.3 Physical and technical capacity building of different food safety laboratories
		4.1.4 Identification of stakeholders and development of a strategy for multi-sectoral coordinated microbial and chemical food safety surveillance programme along the whole food chain/value chain
	4.2 Develop a mechanism for food safety data sharing	4.2.1 Development of a food safety database and data sharing platform
		4.2.2 Developing guidelines and SOPs for food safety data sharing within and across the sectors

5. Food safety emergencies are quickly responded	5.1 Develop a mechanism for responding to food safety emergencies	5.1.1 Developing/ updating guidelines and SOPs for food safety emergency response
		5.1.2 Development and implementation of a surveillance programme for food borne illness in humans and animals

Component 10: Antimicrobial Resistance (AMR)

Coordinated AMR and antimicrobial usage (AMU) surveillance, stewardship programmes on the rational use of antimicrobials in medical and veterinary practices are important strategic actions for AMR mitigation. Improved infection prevention and control (IPC) in communities, health care facilities, as well as farm biosecurity in livestock farms to reduce the use of antimicrobials can contribute to AMR mitigation. Community awareness and engagement play a significant role for AMR containment. It is also important to reduce the spillover of antimicrobials from hospitals, pharmaceuticals and livestock farms and thus the spread of AMR to the environment. GOB will institutionalize and operationalize OH approach for effective control of AMR.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 10 are described below:

Long-term Outcome:

IV. Health threats from antimicrobial resistance reduced

Intermediate Outcome:

10. Prudent use of antimicrobials ensured through good governance and stewardship in One Health approach

Key Strategic Outputs, Action packages and Activities:

Key Strategic Output	Action package	Activity
1. One Health coordination strengthened for AMR containment	1.1 Strengthen multisectoral coordination in planning and implement AMR mitigation programmes	1.1.1 Enhancing national and international partnership for coordination
		1.1.2 Increasing engagement of national focal point and sectoral focal points
		1.1.3 Conducting meetings of National Steering Committee (NSC), National Technical Committee (NTC), and Core Working Group (CWG) on a regular basis
		1.1.4 Identifying priority areas and resource gaps of all sectors
		1.1.5 Coordinated resource planning
	1.2 Review, update and enforce AMR related policies and laws	1.2.1 Implementation of the national AMR containment policy
		1.2.2 Enforcement of "Drugs and Cosmetics Act 2023"

		1.2.3 Formulation of rules and regulation on "Drugs and Cosmetics Act 2023"
		1.2.4 Reviewing and updating the rules and regulation of "Communicable disease Act 2018" and “Diseases of Animal Act 2005” to incorporate items on AMR and reviewing and updating Animal Feed Rules, 2013 Fish Feed Rules, 2011
		1.2.5 Formulation of strategy for regulated use of antimicrobials in plants
2. Integrated AMR surveillance and laboratory capacity strengthened	2.1 Enhance laboratory capacity for AMR surveillance	2.1.1 Ensuring sufficient laboratory manpower and technical capacity
		2.1.2 Ensuring regular logistic supply
		2.1.3 Quality control and quality assurance in laboratory practice
	2.2 Establish AMR laboratory network	2.2.1 Developing policy and guidelines for AMR laboratory networking
		2.2.2 Sharing expertise and resources between the laboratories following the guidelines
		2.2.3 Inter-laboratory collaboration on quality control and quality assurance of AMR related laboratory work
	2.3 Develop public-private partnership for AMR surveillance	2.3.1 Mapping private laboratories involved in AMR testing
		2.3.2 Engagement of private laboratories in AMR surveillance programme based on public-private partnership
		2.3.3 Sharing expertise between public and private laboratories
	2.4 Develop a coordinated mechanism of AMR laboratory data management and sharing	2.4.1 Installation of AMR laboratory information management system (LIMS) or its integration with existing LIMS and development of digital reporting system

		2.4.2 Technical capacity development on laboratory data management
		2.4.3 Development/ maintenance of AMR data dashboard
		2.4.4 Developing a mechanism of reporting of unusual resistant pattern and emerging multidrug resistant organism
		2.4.5 Sharing AMR antibiogram and trend data with clinicians through AMR dashboard and/or published bulletins
	2.5 Develop AMR biorepository	2.5.1 Development of SOP for AMR biorepository
		2.5.2 Identification of laboratories for developing and maintaining AMR biorepository
		2.5.3 Development of physical and technical capacity for AMR biorepository
		2.5.4 Ensuring biosafety and biosecurity of biorepository
3. Antimicrobial consumption (AMC) and antimicrobial usage (AMU) properly monitored	3.1 Develop/improve antimicrobial consumption (AMC) and antimicrobial usage (AMU) surveillance	3.1.1 AMU surveillance in healthcare facilities, communities and livestock,poultry and aquaculture farms
		3.1.2 Integrated data management from human, animal and fisheries sectors
		3.1.3 Three way linking of AMR, AMC and AMU data of human, animal, fisheries and environment sectors
4. AMR Stewardship programmes strengthened for rational use of antimicrobials	4.1 Expand AMR stewardship program	4.1.1 Reviewing/updating existing AMR stewardship programmes and development of new programmes for health care facilities
		4.1.2 Developing/updating standard treatment guidelines for medical and terrestrial and aquatic animal healthpractices
		4.1.3 Developing a prescription audit system

		4.1.4 Promoting evidence-based use of antimicrobials by the physicians and terrestrial and aquatic animal health professionals
5. Use of antimicrobial reduced through effective infection prevention and control and improvement of hygiene and sanitation	5.1 Improve hygiene and sanitation in the communities, health care facilities and livestock and aquaculture farms	5.1.1 Identification of the risks and points of intervention for improving hygiene and sanitation in communities, health care facilities and livestock and aquaculture farms to reduce infection and use of antimicrobials
		5.1.2 Awareness building on common sanitation and hygienic practices in the community, health care facilities,livestock and aquaculture farms
		5.1.3 Ensuring good practices in livestock, aquaculture and agricultural production
6. Environmental spread of AMR reduced	6.1 Reduce the spillover of antimicrobials in the environment	6.1.1 Assessment of the risks of environmental spread of AMR
		6.1.2 Improving waste disposal and effluent treatment in pharmaceuticals
		6.1.3 Proper disposal of hospital waste
		6.1.4 Proper disposal and treatment of litter from livestock and effluents from aquaculture farms
7. Stakeholders engaged in AMR containment programmes	7.1 Increase the awareness and engagement of different stakeholders in containing AMR	7.1.1 Mapping stakeholders and community for engagement in AMR mitigation programme
		7.1.2 Development of evidence based, integrated/sector-specific communication materials for social behavioral change and community engagement
		7.1.3 Implementation of the risk communication and community engagement programme

Component 11: Health of Environment and Ecosystem

Health of the environment and ecosystem are key drivers of preservation of health across human, animal and wildlife interfaces. Protection and restoration of ecosystems at human-domestic animals-wildlife interface by preventing ecosystem degradation including deforestation and biodiversity loss and change in land use patterns are a priority OH areas. It is essential to ensure clean water, energy and air for the health of humans, animals and ecosystems. Mitigating climate change impact on human, animal, plant and environmental health is another important strategic issue. GOB will endorse and implement One Health approach for best use of investment for a healthy environment and ecosystems.

The long term outcome, intermediate outcome, key strategic outputs, action packages and activities of Component 11 are described below:

Long-term Outcome:

V. Health of environment and ecosystems preserved

Intermediate Outcome:

11. Biodiversity and ecosystems protected and restored and Environment Performance Index (EnPI) improved to support the health of people, animals, plants and ecosystems

Key strategic outputs, Action packages and Activities:

Key Strategic Output	Action Package	Activity
A. Ecosystem Vitality		
1. Biodiversity and habitat conserved, restored, and sustainably used	1.1 Extend coverage of protected and conserved areas	1.1.1 Preparing biodiversity inclusive spatial planning within the national jurisdiction of Bangladesh
		1.1.2 Extending the coverage of protected area (PA), ecologically critical area (ECA), and other effective area-based conservation measures (OECM) in terrestrial, freshwater, and coastal and marine ecosystems.
		1.1.3 Prepare management effectiveness evaluation report of PA, ECA & OECM
		1.1.4 To reduce human-wildlife conflict and wildlife hunting and illegal trade
		1.1.5 Ensure community engagement such as women, children, young, local community and ethnic minorities group in conservation and sustainable use of biodiversity in PA, ECA & OECM
	1.2 Restore degraded ecosystem	1.2.1 Preparing a red list of ecosystems

		1.2.2 Developing ecosystem (terrestrial, freshwater, and coastal and marine) **management and** restoration strategy and action plan.
		1.2.3 Rehabilitation of highly polluted aquatic ecosystem
		1.2.4 Establish aquatic and wildlife sanctuary to retain biodiversity
		1.2.5 Extending the restoration coverage of degraded ecosystems.
		1.2.6 Conduct vulnerability assessment of major and critical unidentified wetlands in Bangladesh as per guidelines of Ramsar Convention (1971) & Convention on Biological Diversity (CBD, 2006) as well as Millennium Ecosystem Assessment (MEA, 2005) will be undertaken.
		1.2.7 Accomplish economic valuation of ecosystem services and ensure payment of ecosystem services.
	1.3 Increase the Sharing of Benefits from Genetic Resources, Digital Sequence Information and Traditional Knowledge	1.3.1 Ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources.
		1.3.2 Ensure the documentation of traditional knowledge, gene sequence of commercially important genetic resources, traditional community Knowledge associated with genetic resources
	1.4 Implement species conservation program	1.4.1 Prepare and update species red list
		1.4.2 Implement conservation action plan already prepared for tiger, elephant, Ganges river and Irrawaddy dolphin, Shark and Ray, Vulture and Gharial.

		1.4.3 Continue conservation breeding program of saltwater crocodile, gharial, turtle and tortoises, marine turtles, Asiatic black bear, nilgai, elephant, spotted deer, Sambar deer and so on
		1.4.4 Undertake conservation breeding program of slow loris, pangolin, wild dog, wild goat, gharial, freshwater crocodile and so on
	1.5 Strengthen Alien Invasive Species (IAS) Management	1.5.1 Prepare country checklists of alien invasive species, within the Global Register of Introduced and Invasive Species (GRIIS)
		1.5.2 Implement IAS management plan in Protected Areas including ECAs of Bangladesh
		1.5.3 Promote the mechanism to defend entry, exposure, spread and eradication of alien invasive species with strengthening quarantine at ports
	1.6 Minimize human wildlife conflict	1.6.1 Prepare species-specific human-wildlife conflict mitigation strategy and action plan.
		1.6.2 Strengthen Elephant Response Team (ERT), Village Tiger Response Team (VTRT)
		1.6.3 Develop and implement Communication, Education, Participation, and Public Awareness (CEPA) Strategy and Action Plan
		1.6.4 Implement transboundary MoU, Protocol and SOP for the mitigation of Human-Wildlife Conflict.
	1.7 Strengthen Wildlife Crime Control Unit (WCCU) to combat illegal hunting and trafficking	1.7.1 Formulate Wildlife Crime Control Unit (Operation) rules 1.7.2 Develop endowment fund for WCCU

	1.8 Promote nature-based solution (NBs) for human wellbeing	1.8.1 Develop Sectoral Action Plan to promote NBs and Eco-Disaster Risk Reduction (EDRR) 1.8.2 Increase coverage of green and blue spaces in major cities
	1.9 Manage ecosystem of the blue economy	1.9.1 Develop and update ecosystem management policies, guidelines and institutional capacities for management of the blue economy
		1.9.2 Resource inventory / stock assessment for blue economy
		1.9.3 Restoration of the coral reef ecosystem in the St. Martin Island
2. Tree and forest coverage increased and sustainable forest management promoted	2.1 Extend tree cover and promote sustainable forest management	2.1.1 Conducting National Forest Inventory and publishing report
		2.1.2 Increasing tree cover of the country
		2.1.3 Extending forest cover in relation to forest area of the country
		2.1.4 Restoring Forest land to at least 15% of the total degraded forest land
		2.1.5 Strengthening collaborative forest management in and outside PA's
		2.1.6 Implementation of PA Management Rules and Global Center on Adaptation rules
3. Sustainable fisheries management promoted	3.1 Ensure sustainable fishery management	3.1.1 Preparing fish stock assessment reports in freshwater, coastal and marine ecosystems
		3.1.2 Extending coverage of sustainable and safe fisheries in freshwater and coastal and marine ecosystems to ensure protein supply
		3.1.3 Promoting ecosystem approaches to fisheries (EAF) to ensure realistic, equitable and sustainable fisheries management
	4.1 Strengthen air pollution monitoring	4.1.1 Updating and implementation of Air Pollution (Control) Rules, 2022

4. Air Pollution monitoring system strengthened	system and mitigation program	4.1.2 Extending air quality monitoring stations in major cities and vulnerable border areas
		4.1.3 Declaring degraded airshed
		4.1.4 Installation of Air Pollution Control (APC) Technology in Industries
5. Sustainable and safe agricultural practices promoted	5.1 Promote sustainable and safe agriculture for human wellbeing	5.1.1 Developing legal, policy and regulatory framework to ensure sustainable fertilizer management and reducing the use of harmful pesticides and PGRs (Plant Growth Regulators)
		5.1.2 Promoting Integrated Pest management (IPM) and biopesticides in safe agricultural practices
		5.1.3 Preparing relative crop productivity report regularly
		5.1.4 Ensuring sustainable food production system and implementing resilient agricultural practices
		5.1.5 Conducting a situation analysis to identify plant pathogens causing health hazards to human and animal health
6. Sustainable and safe water resources management promoted	6.1 Promote sustainable water management and control water pollution for human wellbeing	6.1.1 Reducing use of ground water and promoting economic use of surface water
		6.1.2 Preparing report on total wastewater generated, collected, treated, and recycled regularly
		6.1.3 Promoting zero liquid discharge among business and community
		6.1.4 Continuous Water Quality Monitoring
		6.1.5 Connectivity establishment among rivers and it's canals and wetlands
		6.1.6 Water pollution control Model for decision support
		6.1.7 Promoting no discharge of waste from industry, hospital, dairy and livestock

		farms into aquatic environment etc without proper treatment
		6.1.8 Water shed protection
		6.1.9 Conservation of aquatic ecosystems
		6.1.10. Establishment of wetland center
		6.1.11. Capacity building and awareness raising
		6.1.12 Update wetlands and reservoirs mapping
B. Health of Environment		
7. Air Quality Health Index improved	7.1 Increase air quality health index for human health and wellbeing	7.1.1 Developing Air Quality Health Index
		7.1.2 Implementation of Air Quality Management Plan
		7.1.3 Facilitating environment friendly electric vehicles.
		7.1.4 Encouraging/ facilitating use of non-fired bricks/ blocks.
		7.1.5 Reducing and removal of anthropogenic air pollutants and GHG exposure
8. Monitoring unsafe sanitation strengthened and access to safe water increased	8.1 Strengthen monitoring unsafe sanitation and to increase access of safe water	8.1.1 Strengthening monitoring of unsafe sanitation for human health, animal health and wildlife
		8.1.2 Increasing access to safe drinking water inclusive of climate vulnerable communities
9. Release of heavy metals into the environment reduced	9.1 Strengthen legal and policy framework for reducing heavy metal pollution	9.1.1 Develop **and implement** legal, policy and regulatory framework to reduce/ eliminate lead, mercury pollution and other heavy metals
10. Sustainable consumption promoted and food	10.1 Promote sustainable consumption and reduce food waste	10.1.1 Developing legal, policy and regulatory framework to promote sustainable consumption and reduce food waste.

waste generation reduced		10.1.2 Promoting conversion of waste to clean energy.
		10.1.3 Strengthening awareness for avoiding use of single-use plastic and encouraging businesses to adopt circular economy (3R).
11. Waste management improved	11.1 Ensure proper management of all sorts of waste	11.1.1 Strengthening implementation of existing rules and coordination among sectors and communities for all sorts of waste management.
12. Noise Pollution monitoring system strengthened	12.1 Strengthen monitoring of noise pollution	12.1.1 Updating and implementation of Noise Pollution (Control) Rules, 2006
		12.1.2 Declaration of silent zone in major city areas.
		12.1.3 Strengthening monitoring of noise pollution in major city areas.
C. Climate Change		
13. One Health coordination ensured for climate change resilience	13.1. To promote climate resilient One Health	13.1.1 Developing collaboration between public health, animal health, fisheries and aquaculture,wildlife, and environment sector on climate resilient health issues
		13.1.2 Incorporating Health National Adaptation Plan (H-NAP) with National Adaptation Plan (NAP) focusing One Health agenda

3.5 IMPLEMENTATION, MONITORING AND EVALUATION OF THE STRATEGIC FRAMEWORK

The third edition of Bangladesh One Health Strategic Framework (2024 -2030) will be endorsed by the core ministries, i.e., the MoHFW, MoFL, MoEFCC, MoA, and MoFood. The national and sub-national One Health committees will be formed and their ToR will be finalized. One Health Secretariat will be the main custodian for the implementation of the strategic framework ensuring participation of all the relevant stakeholders. A full-fledged organogram of One Health Secretariat along with the ToR of its staff will be developed. The Government will ensure a sustained operational budget of the Secretariat.

For implementation of One Health activities a mechanism will be established for inter-ministerial coordinated financial resource planning and mobilization. One Health investment plan and investment cases will be developed to leverage funding from GoB and international donors.

Under the leadership of One Health Secretariat will develop and use necessary tools and plan for monitoring and evaluation of the Bangladesh One Health Strategic Framework.

References

[1] Schneider, M., Munoz-Zanzi, C., Min, K., & Aldighieri, S. (2019, April 26). "One Health" From Concept to Application in the Global World. Oxford Research Encyclopedia of Global Public Health. https://doi.org/10.1093/acrefore/9780190632366.013.29.

[2] One Health Commission. What is One Health? https://www.onehealthcommission.org/en/why_one_health/what_is_one_health/

[3] One Health High-Level Expert Panel (OHHLEP), Adisasmito WB, Almuhairi S, Behravesh CB, Bilivogui P, Bukachi SA, et al. (2022) One Health: A new definition for a sustainable and healthy future. PLoS Pathog 18(6): e1010537. https://doi.org/10.1371/journal.ppat.1010537

[4] Strategic framework for One Health approach to infectious diseases in Bangladesh, 2012. Available at https://www.iedcr.org/pdf/files/One%20Health/Strategic_framework_for_One_Health_Bangladesh-26%20Jan.pdf

[5] Strategic Framework and Action Plan for the Application of a One Health Approach in Bangladesh (2017 – 2021). Available at https://iedcr.portal.gov.bd/sites/default/files/files/iedcr.portal.gov.bd/page/14255b07_1648_4beb_b86f_af1ec91f74ca/2023-05-31-03-17-5f66ed7036d805aae332f882ebb15e74.pdf

[6] Debnath, N. et al. (2024). Toward the Institutionalization of a One Health Agenda: What the World can Learn from Bangladesh. One Health Cases, CABI. https://doi.org/10.1079/onehealthcases.2024.0018

[7] McKenzie, J.S. et al. (2016). One Health research and training and government support for One Health in South Asia. *Infection Ecology & Epidemiology*, *6*(1). https://doi.org/10.3402/iee.v6.33842

[8] OHASA (One Health Alliance of South Asia). https://www.ecohealthalliance.org/program/ohasa-one-health-alliance-of-south-asia

[9] FAO, UNEP, WHO and WOAH. 2022. One Health Joint Plan of Action (2022–2026). Working together for the health of humans, animals, plants and the environment. Rome. https://doi.org/10.4060/cc2289en

[10] Bangladesh Bureau of Statistics. Population and Housing Census 2022, Preliminary Report. https://sid.portal.gov.bd/sites/default/files/files/sid.portal.gov.bd/publications/01ad1ffe_cfef_4811_af97_594b6c64d7c3/PHC_Preliminary_Report_(English)_August_2022.pdf

[11] Classification of Wetlands of Bangladesh http://dbhwd.portal.gov.bd/sites/default/files/files/dbhwd.portal.gov.bd/page/7b217360_7c6b_4cf3_aa2f_909e31dce458/Volume%201%20Final%20Report.pdf

[12] Geography of Bangladesh. https://en.wikipedia.org/wiki/Geography_of_Bangladesh

[13] Household Income and Expenditure Survey HIES 2022. Final Report. https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/b343a8b4_956b_45ca_872f_4cf9b2f1a6e0/2023-12-28-14-40-ac2b3d298f569f155a80871a49b7dd9e.pdf

[14] Department of Livestock Services. Livestock Economy.
https://dls.gov.bd/site/page/22b1143b-9323-44f8-bfd8-647087828c9b/Livestock-Economy

[15] National Livestock Development Policy 2007.
https://faolex.fao.org/docs/pdf/bgd161823.pdf

[16] Gilbert, M., et al. Global distribution data for cattle, buffaloes, horses, sheep, goats, pigs, chickens and ducks in 2010. *Sci Data* **5**, 180227 (2018).
https://doi.org/10.1038/sdata.2018.227

[17] Uddin, N. et al. (2023) Laundered alive? The transnational trade in wild felids through Bangladesh. *Global Ecology and Conservation*, 41. e02356.
https://doi.org/10.1016/j.gecco.2022.e02356

[18] One Health Zoonotic Disease Prioritization for Multisectoral Engagement in Bangladesh.
https://www.cdc.gov/one-health/media/pdfs/bangladesh-508.pdf

[19] Cortes M.C. et al. (2018). Characterization of the spatial and temporal distribution of Nipah virus spillover events in Bangladesh, 2007–2013, *Journal of Infectious Diseases*, 217:1390-1394.
https://doi.org/10.1093/infdis/jiy015.

[20] One Health High-Level Expert Panel (2023) One Health action for health security and equity. *The Lancet,* 401 (10376), 530 - 533.
https://doi.org/10.1016/S0140-6736(23)00086-7.

Appendices

Appendix 1

Participatory workshops conducted to update the Strategic Framework

Date	Activity
04 Oct 2023	Kick-off Meeting
Oct 23 – Feb 24	Desk review
27-28 Nov 2023	Scoping workshop (OH capacity assessment, Scope of OH in the present global context – Problem/solution tree)
14-15 Jan 2024	Thematic workshop 1 (Pandemic PPR, Surveillance, Outbreak investigation; workforce; laboratory; Assessment of implementation of 2nd Strategic Framework)
05 Feb 2024	Thematic workshop 2 (Environmental health)
22 Feb 2024	Thematic workshop 3 (Food safety and AMR)
09 June 2024	Thematic workshop 4 (Governance, coordination, networking, communication, research)
July – Sept 2024	Preparation and sharing of draft
02 Oct 2024	Finalizing workshop

Appendix 2:

Laws and legislations relevant to One Health

Sector	Acts	Content
Human health	Communicable Disease (Prevention, Control and Eradication) Act, 2018	The Act was enacted for the purpose of increasing awareness, preventing, controlling, and eradicating infectious diseases, with the aim of managing public health emergencies and reducing health risks. To fulfill the objectives of this Act, the government may formulate rules and amend the schedule by notification in the official gazette.
	Bangladesh Medical and Dental Council Act, 2010	The Act enables the establishment of the Bangladesh Medical and Dental Council which regulates medical and dental education, institutions, and qualifications, and cooperates with international licensing bodies, with committees handling administration and recognition.
	Drugs and Cosmetics Act, 2023	The Drugs and Cosmetics Act, 2023 has relevance to AMR mitigation as this is the legal instrument for regulating the manufacturing, import and marketing of drugs. The Act details licensing procedures for manufacturing and sale, adherence to WHO's Good Practices, and outlines the process for drug registration and market authorization. It also prohibits the sale of substandard or counterfeit drugs and regulates their import and export.
Fisheries and livestock	Animal Disease Act, 2005	The Act provides regulations on identifying animal diseases, separating diseased animals, restriction on movement of animals and organization of fairs during outbreaks, post-outbreak vaccination, diagnostic testing , prohibition on marketing of diseased animals and registration of animals and products.
	Fish Quarantine Act, 2018	The Bangladesh Fish Quarantine Act 2018, enacted by the Ministry of Fisheries and Livestock, regulates fish quarantine, pathogen

		control, import permits, and designates an authority for fish quarantine management.
	Livestock and Animal Products Quarantine Act, 2005	The Act aims to prevent animal disease outbreaks, protect public health, and regulate quarantine, import, and export of animals and animal products, detailing quarantine officer roles, governance rules, and import/export criteria. Animal disease rule 2008
	Animal Welfare Act, 2019	The Animal Welfare Act 2019, replaced the 1920 law. It enhances protections against animal cruelty, raising penalties and covering humane treatment, especially for farm animals. It includes strict penalties for cruelty, provisions for humane euthanasia, and allows further regulations through official gazettes.
	Bangladesh Veterinary Council Act, 2019	This Act establishes the Bangladesh Veterinary Council and regulates the veterinary profession in Bangladesh.
	Zoo Act, 2023	The Act regulates the collection, care, welfare, breeding, conservation, management, and development of government-run zoos.
	Fish Feed and Animal Feed Act, 2010	The Act comprises 24 sections covering regulations for processing, quality control, import, export, marketing, sale, distribution, and transportation of fish and animal feed, with licensing authority designated to the Directors General of Fisheries and Livestock Services.
	Animal Slaughter and Meat Quality Control Act, 2011	An Act to enact the provisions on animal slaughtering and ensuring the availability of quality meat for public consumption and related matters.
Plant and agricultural health	Plant Quarantine Act, 2011	The Act establishes measures to prevent the introduction and spread of pests through international plant trade, focusing on phytosanitary controls within Bangladesh.
	Plant Varieties Protection Act, 2019	The Act establishes a Plant Variety Protection Authority to oversee plant variety registration and protect breeders' and farmers' rights.

Food safety	Food Safety Act, 2013	This Law makes provisions for the establishment of an efficient, effective, scientifically based Bangladesh Food Safety Authority and for regulating, through coordination, the activities relating to food production, import, processing, stockpiling, supplying, marketing and sales as well as to ensure the people's right toward access to safe food through science and technology.
	Fish and Fish Products (Inspection and Quality Control) Act, 2020	The Act mandates standards for the import, export, production, and sale of fish products, requiring licenses for export and factory operations. The Government may set up quality control labs to test fish products and related materials for purity.
Environmental conservation and climate change	Bangladesh Environment Conservation Act, 1995	The Act of 1995 and its 1997 Rules are key for managing industrial water pollution, focusing on environmental conservation, quality improvement, and pollution mitigation; it is enforced by the Department of Environment.
	Climate Change Trust Act, 2010	The Trust aims to develop and implement capacity-building plans to help climate-affected communities improve their livelihoods and resilience. It focuses on advancing adaptation, mitigation, technology transfer, and funding to address climate impacts on people, biodiversity, and nature.
	Sustainable and Renewable Energy Development Authority Act, 2012	The act aims to control global warming, reduce natural calamity risks, and decrease fossil fuel dependence by promoting renewable energy. It is under the Ministry of Power, Energy and Mineral resources.
	Wildlife (Conservation and Security) Act, 2012	This Act mandates the conservation and protection of the country's biodiversity, forests, and wildlife, establishing a Wildlife Advisory Board, regulating hunting, listing vulnerable and endangered species, and detailing penalties for violations.
	Bangladesh Biodiversity Act, 2017	This Act governs biodiversity conservation, sustainable resource use, fair benefit sharing, and

		related activities, detailing committee roles, management structures, biota distribution, biodiversity strategy, funding, and penalties for violations.
	The Forest Act, 2019 (draft)	The Act consolidates laws on forest management, forest-produce transit, and duties on timber and other forest resources. The Forest Act 2019 draft proposes amendments to modernize the Forest Act of 1927, making it relevant to Bangladesh's current context.

Appendix 3:

Terms of References of different committees for One Health Governance and Coordination and One Health Secretariat (OHS)

1. National One Health Advisory Committee

1. Advise and support intersectoral collaboration.
2. Provide guidance on adaptation of integrated policies for human, terrestrial and aquatic animal, and environmental health.
3. Engage with international commissions and boards to represent Bangladesh's One Health policy and pursue actions when required.
4. Offer guidance to the One Health Inter-ministerial Steering Committee as required.
5. Provide coordination and policy-level decision-making support during health emergencies that impact humans, animals, fishes and the environment.
6. Frequency of meeting: The Steering Committee will meet once in a year.

2. One Health Inter-ministerial Steering Committee

1. Approval of establishment of Divisional/ District/ Upazila One Health Coordination Committees and TOR of Secretariat and other relevant One Health entities
2. Establish policy for OH implementing partners on issues pertaining to One Health
3. Guide One Health Secretariat for the implementation of One Health activities in Bangladesh and sustainable resource mobilization of One Health Secretariat
4. Advise the Government of the People's Republic of Bangladesh on any issues related to One Health
5. Evaluate the Progress of One Health activities and give guidance for further improvement
6. Relevant desk of the lead ministry will provide the secretarial support to the Steering Committee. In case of Ministry of Health, the Public Health -3, Ministry of Health and Family Welfare
7. Frequency of meeting: The Steering Committee will meet twice in a year

3. One Health Intersectoral Technical Committee

1. Provide technical feed to any emergency response management issues pertaining to One Health
2. Provide technical, managerial and administrative guidance to One Health Secretariat for effective coordination and collaboration among One Health partners
3. Propose to the Steering Committee on issues related to One Health
4. Give an option for guidelines/document/protocol development, endorse and forward to the Steering Committee
5. Guide One Health Secretariat for advocacy on different cross cutting One Health issues

6. Monitor, review and evaluate the work and progress of One Health Secretariat and suggest corrective measures as an when necessary
7. Frequency of meeting: The Intersectoral Technical Committee will meet every 6-months (twice in a Calendar year)

4. One Health Secretariat Coordination Committee

1. The National One Health Coordination Committee (Director level committee) will be responsible for routine coordination of One Health activities in Bangladesh under the guidance and advice of One Health Intersectoral Technical Committee (Director General or Chairman level committee), One Health Inter-ministerial Steering Committee (Secretary level committee) and National One Health Advisory Committee (Minister level committee).
2. The National One Health Coordination Committee will also facilitate and monitor One Health coordination at sub-national levels through Divisional, District and Upazila One Health Coordination Committees.
3. Monitor and review the activity of One Health Secretariat
4. Provide onsite guidance to the Secretariat on any relevant issue
5. Report to Technical Advisory Group on the performance of One Health Secretariat
6. Frequency of meeting: As and when required

5. Divisional/ District/ Upazila One Health Coordination Committee

1. Coordinate One Health-related events across core sectors, including human health, animal health, the environment, agriculture, fisheries, and food safety at divisional/district/upazila level.
2. Raise awareness among stakeholders and communities at the divisional, district, and upazila levels about One Health.
3. Maintain regular coordination with the National One Health Coordination Committee to ensure effective implementation of OH related activities and new developments
4. Frequency of meeting: As and when required

One Health Secretariat in Bangladesh (OHSB):

The secretariat will:

1. Develop and continue a sustainable and functional network among One Health partners for the prevention, detection and response for averting emergence of pandemic and other health hazards arising at human, animal. ecosystems interface;
2. Support the development or updating of policies, plans, protocols, standard operating procedures pertaining to One Health issues with special focus on Emerging Infectious Diseases, Zoonoses and Antimicrobial Resistance;
3. Facilitate the development of evidence-based advocacy and communication packages for advocacy and communication with policy planners and the community.

4. Ensure information sharing among the partners about any event having potential impact on the health of human, animal, aquatic and ecosystems those requiring coordination and collaboration among the key One Health partners, publish One Health Newsletter and manage One Health website.
5. Facilitate formation of problem specific working group(s) drawing experts from the key One Health partners and multi- disciplinary response teams for responding to health events arising at human, animal, ecosystems interface and coordinate joint outbreak investigation and surveillance;
6. Facilitate disease prioritization process involving multi stakeholders and recommend priority research and action;
7. Develop monitoring and evaluation tool for assessing One Health status of the country and suggest appropriate interventions for improving the status;
8. Facilitate One Health capacity building across the partners, sectors and disciplines; and organization of meetings, workshops, and conferences on One Health
9. Any other functions or responsibilities assigned or directed by the Inter-ministerial Steering Committee on One Health

Management, Reporting and Accountability:

1. The Secretariat will be directly supervised by Chairperson, Co-ordination committee and will also follow the technical guidance from the technical advisory group.
2. Chairperson, Co-ordination committee will report to the inter-Ministerial Steering Committee on One Health Secretariat

Appendix 5

Structured Engagement: A Visual Compilation of Participatory Workshops

Picture 2: Group works during component wise thematic workshops