National One Health Strategic Plan

2018 - 2022

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA



The Federal Democratic Republic of Ethiopia Ministry of Health

The Federal Democratic Republic of Ethiopia Ministry of Culture and Tourism

The Federal Democratic Republic of Ethiopia Ministry of Environment, Forest and Climate Change

The Federal Democratic Republic of Ethiopia Ministry of Agriculture and Livestock Resources

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Preparedness & Response ONE HEALTH IN ACTION

Foreword

Studies have shown that close to a third of all human pathogens and up to 75 percent of emerging ones are zoonotic in nature, i.e., spread between humans and animals. The rapid increase in human population leading to increased pressure on land resources including encroachment on animal habitats, and the rising demand for animal protein, coupled with increased global trade and travel and other drivers of emerging pandemic threats, have increased the risk of emerging and re-emerging diseases occurring locally and their spread across international borders.

The Government of Ethiopia and its development partners recognize the critical importance of intensifying multisectoral and multidisciplinary collaboration and coordination to be able to effectively prevent, detect, and respond to health threats at the animal, human, and environmental interface. The development of this strategic plan demonstrates the government commitment to action. This document presents our vision, mission, key pillars, strategic objectives, and activities proposed to be implemented in the next five years (2018-2022) to reduce the risks and impacts of emerging health threats to negligible levels.

The development of this strategic plan has been achieved through close collaboration among the leading line Ministries responsible for human health, animal health (domestic and wildlife) and the environment, and other governmental institutions, as well as multi-lateral and bilateral partners, and national and international nongovernmental organizations. This renewed multisectoral and multidisciplinary commitment will continue to drive actions toward achieving the short- and long-term results envisaged in this strategic plan in an effort to make Ethiopia and the larger world safe from infectious diseases.

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ACRONYM AND ABBRIVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AMR	Anti-Microbial Resistance
AHRI	Armauer Hansen Research Institute
CAHW	Community Animal Health Workers
CBHI	Community-Based Health Insurance
CCM	Comitato Collaborazione Medica
CDC	US Centers for Disease Control and Prevention
CSA	Central Statistical Agency
EEITI	Ethiopian Extractive Industries Transparency Initiative
EFMHACA	Ethiopian Food, Medicine and Health Care Administration and Control Authority
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institute
ESA	Ethiopian Standards Agency
EVA	Ethiopian Veterinary Association
EWCA	Ethiopian Wildlife Conservation Authority
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GHSA	Global Health Security Agenda
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
HDA	Health Development Army
HEP	Health Extension Program
HEW	Health Extension Workers
HPAI	Highly Pathogenic Avian Influenza
HSDP	Health Sector Development Plan
IHR	International Health Regulation
ITCZ	Intertropical Convergence Zone

LDC	Least Developed Countries
LIC	Least Income Countries
JEE	Joint External Evaluation
LMP	Livestock Master Plan
MoALR	Ministry of Agriculture and Livestock Resources
MoCT	Ministry of Culture and Tourism
MoEFCC	Ministry of Environment, Forest and Climate Change
MoH	Ministry of Health
MoALR	Ministry of Agriculture and Livestock Resources
NAHDIC	National Animal Health Diagnostics and Investigation Center
NCC	National Coordination Committee
NGO	Non-Governmental Organization
NOH	National One Health
NOHP	National One Health Platform
NOHSC	National One Health Steering Committee
NICETT	National Institute for Control and Eradication of Tsetse and Trypanosomosis
NVI	National Veterinary Institute
OHCEA	One Health Central and Eastern Africa
OHWF	One Health Work Force
PHEM	Public Health Emergency Management
PSNP	Productive Safety Nets Program
TWG	Technical Working Group
USAID	United States Agency for International Development
ULD	Unknown Liver Disease (ULD), now called Pyrrolizidine alkaloid-induced liver disease
VDFACA	Veterinary Drugs and Feed Administration and Control Authority
VRAM	Vulnerability Risk Assessment and Mapping
WHO	World Health Organization

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I. EXECUTIVE SUMMARY

Zoonotic diseases, Anti-Microbial Resistance (AMR), and other public health events of epidemic and pandemic potential are critical threats to health security and socioeconomic wellbeing. With the increasing interactions between humans and animals within the environment and numerous factors exacerbating the emergence, re-emergence, and spread of infectious diseases, the importance of multisectoral and multidisciplinary collaboration and coordination to prevent, detect, and effectively respond to these threats cannot be overemphasized.

The One Health approach, adopted as the core driver of the Global Health Security Agenda (GHSA)–an alliance of more than 60 governments and international partners to make the world safer from infectious diseases--is a mechanism that enhances collaboration among the human, animal, and environment sectors to deliver optimal health for humans, animals, and the environment. Although Ethiopia has made significant steps to strengthen the animal and human health services both in manpower and facilities, cross-sectoral efforts to prevent, detect, and respond to health threats at the interface are still at an initial stage. Cross-sectoral collaborations have been limited in their lifespan and specific in their scope and are disbanded once the threat is contained or reduced.

To push the GHSA and other international and national commitments forward, Ethiopia has formally set up a National One Health Steering Committee (NOHSC) and Technical Working Groups (TWG)—comprising core Government Ministries and other relevant actors within the human, animal, and environmental health mandates—to strengthen multisectoral coordination and collaboration. To accelerate the multisectoral coordination and collaboration and reduce the risks of health threats at the animal-environment-human interface in the country, One Health actors have come together to develop a five-year strategic plan for the period 2018-2022.

During the strategic planning process, stakeholders assessed the existing strengths and weaknesses, including those within the national platform and multi-stakeholder engagement funding sources, related to resource mobilization, disease surveillance, laboratory capacity, food safety, bio-safety and bio-security, communications, and information exchange.

The strategic vision and mission for the National One Health strategy that guides the actions for achieving the vision have been defined. One Health actors envision “Ethiopia with negligible risks and impacts of endemic, emerging and re-emerging health threats at the animal-environment-human interface.” Accordingly, the mission, or fundamental purpose, of the strategy is “to establish sustainable One Health coordination mechanisms at all levels for multi- disciplinary and multisectoral engagement in the prevention, detection and response to endemic, emerging and re-emerging health threats at the human, animal and environment interface”. Key identified areas of focus or pillars of the strategy are Coordination and Collaboration, Preparedness and Response, Surveillance and Reporting, Policy, Advocacy and Communication, and Research and Capacity Building. Strategic objectives and activities for each objective were also identified and are presented in this strategic document along with the monitoring and evaluation framework, resources, and institutional arrangement and leadership.

II. INTRODUCTION

2.1. OVERVIEW OF ONE HEALTH IN ETHIOPIA

The danger of zoonotic diseases, antimicrobial resistance, and other emerging pandemic threats to public health security and socioeconomic wellbeing increasingly has become a critical global concern. This issue has been attributed to factors such as climate change, globalization, agricultural intensification, growth in human populations leading to pressure on land resources, increased global trade and travel, and increased use of antimicrobial substances in animal production and food preservation. Together these factors pose complex health threats that require multisectoral collaboration mechanisms to either prevent or detect early and respond in a timely manner to contain them at source and mitigate potential impact on humans, their livelihoods, and economies.

Ethiopia is the second-most populous country in Africa and the 13th in the world, with a population of 94.4 million people. It has a growth rate of 2.6 percent[1]. This context coupled with an ambitious livestock intensification plan to cater for the growing population, rich biodiversity, and close interaction between humans and animals, puts Ethiopia at elevated risk of emerging pandemic diseases and other global threats such as antimicrobial resistance and food safety and bio-safety and bio-security issues, in addition to the existing burden of endemic diseases. The One Health approach has been adopted as the core driver of the Global Health Security Agenda (GHSA), which seeks to strengthen countries' health systems to prevent, detect, and respond to public health threats and events of national and international concern.

In the past few decades, the government of Ethiopia (GoE) has made remarkable investments to strengthen the animal and human health services both in workforce and facilities. However, the institutions are set up in such a way that they function independently, and no formal coordination exists especially when dealing with diseases that require cross-sectoral efforts for prevention and/or control.

The recent GHSA/International Health Regulations 2005 (IHR) Joint External Evaluation (JEE)[2], conducted by the World Health Organization (WHO), found that the GoE has a strong political commitment to improve public and animal health systems through their respective ministries. Both sectors were found to have good capacity in the establishment of diagnostic laboratories, surveillance, and response systems. However, there were gaps in communication and collaboration between the animal health and public health sectors and an absence of formal or legal linkages, structures, or policies for collaboration between them and with other sectors, such as wildlife and agriculture.

Although there have been no formal multisectoral coordination mechanisms, Ethiopia has a history of several ad hoc cross-sectoral collaboration initiatives in the management of infectious disease threats, which individual sectors usually lead. Such cross-sectoral collaborations have been limited in their lifespan and specific in their scope and are disbanded once the threat is contained or reduced.

[1] Central Statistics Authority, Country Population Projection (2017)
[2] WHO, GHSA Joint External Evaluation for Ethiopia (2016)

In recognition of the intrinsic relationship between humans, animals, and their environment, and as part of the implementation of the GHSA, Ethiopia increasingly has embraced the One Health approach to prevent, detect, and respond to existing and emerging threats. With the support of partners, the GoE formally established the National One Health Steering Committee (NOHSC) in 2017. The committee comprises representatives of core government ministries, namely: the Ministry of Health (MoH); the Ministry of Agriculture and Livestock Resources (MOALR); the Ministry of Culture and Tourism (MoCT)/Ethiopian Wildlife Conservation Authority; and the Ministry of Environment, Forest and Climate Change (MoEFCC).

The NOHSC is mandated to facilitate multisectoral coordination and collaboration among One Health stakeholders at national and subnational levels and strive toward the establishment of a sustainable institutionalized One Health platform in the country. Efforts to establish disease-specific technical working groups (TWGs) to lead initiatives for their sustainable prevention and control have already begun and are gathering momentum. The TWGs are envisaged to provide expert forums for tackling zoonotic diseases to enhance mutual accountability and collaboration among the sectors and promote greater efficiencies in the management of zoonotic diseases and other health threats using the One Health approach in the country.

2.2. ONE HEALTH STRATEGIC PLANNING

As part of the development of this strategic plan, stakeholders assessed strengths and weaknesses of One Health development in Ethiopia, including within the national platform and multi-stakeholder engagement, related to funding sources and resource mobilization, disease surveillance, laboratory capacity, food safety, bio-safety and bio-security, communications, and information exchange. The analysis also identified opportunities and threats in the external environment, including legislative, socio-economic, technological, and environmental dimensions. These exercises have formed the backbone for the development of the national One Health Strategic Plan.

III. SITUATIONAL ANALYSIS

3.1. NATIONAL ONE HEALTH INITIATIVES

Table 1: Summary of One Health Initiatives, Composition, Roles, and their Status

Multi-Stakeholder One Health Initiatives in the Country	Representation, Leadership and Multi-Stakeholder Involvement	Summary of Roles, Achievements/Areas of Engagement and Current Status
Multi-Disciplinary Team to Identify the Cause of Unknown Liver Diseases (ULD)	▪ Physicians, Veterinary Epidemiologist, Anthropologist, and Environmental and Plant Scientists represented from the Ministry of Health, Ministry of Agriculture, EPHI, WHO-Ethiopia, Food and Agriculture Organization (FAO), Addis Ababa and Mekele Universities	▪ Identify the causes of the then Unknown Liver Disease (ULD), which affected both humans and animals in Tigray Regional State in 2005 ▪ Collaboration with local and overseas institutes ▪ ULD[3] was later re-named "Pyrrolizidine alkaloid induced liver disease", and the initiative is not currently active
National Coordination Committee for Highly Pathogenic Avian Influenza	▪ Ministry of Agriculture and Rural Development (MoARD) and MoH ▪ Chaired by the deputy prime minister, who was also the Minister of Agriculture. ▪ Under the TCC there were three sub committees: resource mobilization, prevention and control, and advocacy and communication	▪ To respond to the emergence of Highly Pathogenic Avian Influenza (H5N1) in 2006. ▪ Jointly developed a National Strategic Emergency Preparedness Plan against the Avian / Human Influenza pandemic threat ▪ Also served in drafting the Rift Valley Fever contingency plan during the 2006-2007 outbreak of the disease in neighboring countries like Kenya The NCC was disbanded when the threat of HPAI abated, and no longer functions.

[3] Evaluation of the Pyrrolizidine Alkaloid Induced Liver Disease (PAILD) Active Surveillance System in Tigray, Ethiopia (2013).

Multi-Stakeholder One Health Initiatives in the Country	Representation, Leadership and Multi-Stakeholder Involvement	Summary of Roles, Achievements/Areas of Engagement and Current Status
Zoonotic Disease Technical Working Group	▪ Led by the EPHI ▪ Has never sat as an entity, and most of the efforts are made on individual basis	▪ An initiative established to coordinate, facilitate, and promote One Health embedded efforts toward zoonotic disease prevention, detection, and response in Ethiopia in line with targets set under the GHSA
Antimicrobial Resistance Prevention and Containment Advisory Committee	▪ Initiated and led by the FMHACA ▪ The task force has members from the VDFACA FMOH; FMOAN; MOALR; MoEFCC; EFMHACA; EPHI; NAHDIC; universities; partners such as WHO-E, USAID/SIAPS, CDC, and FAO; associations and other relevant national and international stakeholders ▪ Getting support from CDC and FAO	▪ This technical working group, established in 2006, has a taskforce and committee ▪ Committee advocates and plays catalyzing role in the respective member institutions and others on AMR containment ▪ Contributed in recommending and reviewing AMR baseline and in developing AMR strategy ▪ It has subcommittees: national alliance, antimicrobials use in humans and animals, surveillance, infection prevention and patient safety in humans and animals, and education and research ▪ Efforts are underway to undertake activities through the formation of a technical subcommittee that involves professionals from human and animal health as well as international organizations such as FAO.
Rabies and Anthrax Technical Working Group	▪ All One Health actors including CDC, FAO, Ohio State GOHi, USAID, and WHO	▪ Coordinate efforts toward Rabies and Anthrax in Ethiopia ▪ The technical working group is currently active and leads the strategic plans on Rabies and Anthrax prepared in 2017
One Health Central and East African University Network	▪ A network of 21 public health and veterinary higher education institutions that are in eight countries in the eastern, central, and western	▪ The universities are undertaking activities to cultivate the culture of multisectoral collaboration through training involving public health, animal health, environment,

Multi-Stakeholder One Health Initiatives in the Country	Representation, Leadership and Multi-Stakeholder Involvement	Summary of Roles, Achievements/Areas of Engagement and Current Status
	Africa region. Three universities—Jimma, Mekele, and Addis Ababa— represent Ethiopia.	and natural-resource disciplines. ▪ Established One Health student clubs and are practicing One Health approach through field attachment, experimental learning, training, and research
One Health Jigjiga Initiative (JOHI)	▪ Jigjiga University, the Armauer Hansen Research Institute (AHRI—MOH), and the Swiss Tropical and Public Health Institute in Basel	▪ The initiative is aimed at building the capacity of Jigjiga University to become a center of excellence for One Health studies and create innovative integrated health systems for the improvement of health and wellbeing of pastoral communities. ▪ The initiative was started in 2016 and is expected to be active at least for 12 years
The OSU Global One Health Initiative	▪ Ohio State University established the Ohio State University Health Sciences-Ethiopia One Health Partnership task force.	▪ Focusing on pre-service health professionals in the country ▪ Aims to develop a sustainable and mutually beneficial partnership with Ethiopian academic and affiliate partners ▪ This initiative is currently active and established its African regional office in Addis Ababa in 2017.
The Global Health Security Agenda (GHSA)	▪ In partnership with countries from around the world. ▪ Ethiopia is a Phase 1 GHSA country	▪ Launched in February 2014 and is designed to measurably address global vulnerability to public health threats, strengthen systems, and ensure that a trained workforce has the tools needed to prevent, detect, and respond rapidly and effectively to infectious disease threats ▪ Serves as a roadmap to assist countries in complying with IHR 2005 requirements ▪ It is currently active, and the JEE was undertaken in 2016

Multi-Stakeholder One Health Initiatives in the Country	Representation, Leadership and Multi-Stakeholder Involvement	Summary of Roles, Achievements/Areas of Engagement and Current Status
The National Health Security Council (NHSC)	▪ Initiated and led by the MoH	▪ A multisectoral coordination mechanism to coordinate and respond to all kinds of threats, including those posed by zoonotic diseases, radiation or chemicals introduced intentionally, accidentally, or naturally occurring in the country and which require a united and coordinated response from the national institutes and international community because of their rapid propagation and their extensive destructive behavior. ▪ The MoH has drafted regulations and conducted preliminary consultation. The NHSC is still not yet endorsed by the council of ministers.
One Health Steering Committee (OHSC)	▪ Committee formed from four ministries (MoH, MOALR, MoEFCC, and EWCA) and international partners (EPT-2, WHO, CDC, Ohio State GOHi). It is also supported by other international partners, such as FAO, PREDICT, and OHW (OHCEA), which receive funding from USAID for One Health.	▪ Established by stakeholders following a workshop sponsored by the USAID P&R Project ▪ Since September 2016, the OHSC has been actively involved in advocating for the One Health agenda in the country ▪ Currently spearheading the development and signing of an inter-sectoral One Health collaboration MOU, developing the structure of Ethiopian One Health Platform (institutionalization of the One Health Platform) and the development of the One Health Strategic Plan.

3.2. ASSESSMENT OF NATIONAL POLICIES AND STRATEGIES

The summaries of pertinent national policies and strategies and their relevance to the One Health approach in the country are presented below.

THE SECOND GROWTH AND TRANSFORMATION PLAN (GTP II) (2016-2020)[4]

- GTP II has outlined ambitious transformation targets in nine pillars, namely; sustaining rapid and equitable green economic growth, increasing productivity and competitiveness of the production and manufacturing sectors, enhancing the domestic private sector, addressing the infrastructure gap through building the capacity of the domestic construction sector, managing rapid urbanization and unlocking its potential for structural transformation, accelerating human development and technological capability, democratic development and good governance through public sector capacity development and citizenship participation, promoting youth and women empowerment and ensuring effective participation, and building a climate-resilient green economy.
- GTP II strategic pillars and ambitions are aligned with a climate change resilient green economy.
- The commitments made in the GTP II serve as an opportunity to increase support from and partnership with public sectors.

HEALTH SECTOR TRANSFORMATION PLAN (HSTP)[5]

- Developed through the guidance of the framework of the long-term health sector development program, titled, "VISIONING Ethiopia's Path towards Universal Health Coverage through Primary Health Care."
- HSTP gives strategic guidance for programming and service provision and recognizes the current and persisting gaps in community health.
- It has put significant emphasis in promoting health service delivery through improving access, coverage, continuity, and coordination.
- The Health Extension Workers (HEWs) and Health Development Army (HDA) are stated as a great entry point for improving community participation and engagement.
- The HSTP provides strategic guidance on key issues and strategic areas in the health sector.
- Recognized the strategic relevance of multisectoral collaboration and the importance of non-state actors.

[4] FDRE, Second Growth and Transformation (GTP II) (2015/16)
[5] MoH, Health Sector Transformation Plan (HSTP) (2015/16)

LIVESTOCK MASTER PLAN (2016-2020) [6]

- The LMP informs targets set out in GTP II for the livestock sector. The LMP document aspires to reduce the impact of zoonotic diseases on human health (consumers) by controlling zoonotic diseases and ensuring the safety of animal products.
- Pointed out plans to establish a One Health forum at the federal level—and in the main regions, the building of advanced animal health systems.
- Calls for establishment of a robust animal health information system; reduced production losses by controlling prioritized diseases; increased export earnings by reinforcing the quarantine, inspection, and certification system; decreased impact of zoonotic diseases on public health by controlling them and ensuring safety of animal products, improved infrastructure, and addressing policy issues.
- Suggests broad strategies to address the animal health challenge.
- Improves national capacity for early detection and response to animal diseases/threats.

ETHIOPIA NATIONAL ANTHRAX PREVENTION AND CONTROL STRATEGY AND IMPLEMENTATION PLAN (2017-2021)[7]

- The strategy was prepared to prevent and control anthrax in human and animals in the country.
- The strategy aims to contribute to the country's long-term vision of seeing that anthrax is no longer a significant public and animal health problem in Ethiopia by 2030.
- Focused strategy on one of the priority zoonotic diseases—Anthrax. It is under development and not yet endorsed.

STRATEGY FOR THE PREVENTION AND CONTAINMENT OF ANTIMICROBIAL RESISTANCE FOR ETHIOPIA (2015-2020)[8]

- The strategy includes effective antimicrobial resistance (AMR) prevention and containment of the ever-increasing range of infectious threats caused by bacteria, parasites, viruses, and fungi in humans, animals, agriculture, and the environment. The multiple stakeholders across sectors and the whole of society will be coordinated for the prevention and containment of AMR. The five strategic objectives are to:

  Raise awareness and understanding and improve education on antimicrobial use and resistance, prevention, and containment through effective communication and training

[6] MoLF, Livestock Master Plan (LMP) (2015/16)
[7] National Anthrax TWG**,** Ethiopia National Anthrax Prevention and Control Strategy and Implementation Plan (2017)
[8] EFMHACA, Strategy for the Prevention and Containment of Antimicrobial Resistance for Ethiopia (2015)

Strengthen the knowledge and evidence on antimicrobial use and resistance through One Health surveillance and research.

Improve infection, prevention, and contain the spread of resistant microorganisms across human and animal communities and health care settings through individual and environmental sanitation, hygiene, and infection-prevention measures.

Optimize the use of antimicrobials in human and animal health through effective stewardship practices.

Strengthen and establish national alliances and partnerships, management and governance arrangements, and resource mobilizations for the prevention and containment of AMR at all levels.

CLIMATE RESILIENT GREEN ECONOMY (CRGE) STRATEGY[9]

- Build resilience to the negative impacts of climate change, reduce greenhouse gas emissions, and transform the country to a middle-income economy.
- Formulated to embark on building a green economy.
- Gave pathways for the establishment of the MoEFCC to oversee and coordinate the implementation of the CRGE strategy.
- Indicated the need for formulating and effectively implementing environmental strategies and laws that are essential to accelerate the process of building a climate-resilient green economy.

NATIONAL STRATEGY FOR RABIES CONTROL[10]

- Designed to execute multisectoral activities, projects, and programs related to prevention and control of rabies in domestic dogs and humans in Ethiopia, with the goal of eradicating the disease by 2030.
- Has put in place plans to set up regional multisectoral rabies TWGs using a One Health approach.
- Focused strategy on one of the priority zoonotic diseases, rabies. It is under development and not yet endorsed.

ENVIRONMENT POLICY OF ETHIOPIA[11]

- Formulated to embark on building a green economy.
- To implement the CRGE, new institutions and/or organizational structures have been put in place. Key among these efforts is the establishment of the Ministry of Environment and Climate Change to oversee and coordinate the implementation of the CRGE strategy.

[9] FDRE, Climate Resilience Green Economy Strategy (2011)
[10] Rabies TWG, National Rabies Control and Elimination Strategy (2017)
[11] FDRE, The Environmental Policy of Ethiopia (1997)

- Formulating and effectively implementing environmental strategies and laws are essential to accelerate the process of building a climate-resilient green economy.

NATIONAL POLICY AND STRATEGY ON DISASTER RISK MANAGEMENT (DRM)[12]

- Supports a comprehensive framework of Disaster Risk Management (DRM) measures to reduce disaster risks and potential damage caused by a disaster through setting up a comprehensive and coordinated DRM system in the context of sustainable development.

ETHIOPIAN NATIONAL HEALTH CARE QUALITY IMPROVEMENT STRATEGY 2016-2020[13]

- Shows strategies for quality planning, quality improvement, and quality control dimensions for safe, effective, patient-centered, efficient, accessible, comprehensive, affordable, and prompt healthcare services.
- Recognizes the relevance of the efforts of nongovernmental organizations in the health sector and suggested areas for contribution in influencing health care quality.
- Reflects the common concern in healthcare and gives recognition to nongovernmental organizations' role in the issue.
- Contribution areas suggested by the strategy are already being applied in the organization's existing interventions and can be expanded.

EPHI STRATEGIC PLAN (SP) (2015/16-20/21)[14]

- Study on priority zoonotic diseases at human, animal, ecosystem interface. It emphasized a One Health approach as a mechanism to implement the strategy.
- The SP also indicated the development, institutionalization, and implementation of the One Health approach for strengthening cross-sectoral collaboration and partnership in public health research.

ARMAUER HANSEN RESEARCH INSTITUTE (AHRI) STRATEGIC PLAN (2016 - 2020)[15]

- Established by the council of ministers with regulation 376/2016, AHRI operates under the governance of the MoH and is mandated to research, adapt, and implement biomedical, clinical, and medical biotechnologies in the country.

[12] FDRE, National Policy and Strategy on Disaster Risk Management (1993)
[13] MoH, Ethiopian National Health Care Quality Improvement Strategy (2015/16)
[14] EPHI, Strategic Plan for the EPHI (2015)
[15] AHRI, Strategic Plan for AHRI (2016)

- The One Health approach in research and capacity building training is part of the AHRI strategic plan (capacitate regional health professionals; capacity building at university level). Main zoonotic research portfolio includes BTB, Brucellosis, and others.
- Close collaboration with other sectors (e.g., wildlife, environment, MOALR). Emphasis now is on One Health approaches among pastoral communities in terms of integrated human-animal research/surveillance/health delivery systems.

3.3 ANALYSIS OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS

Table 2: Strengths and Weaknesses Identified Internally

Strength	Weakness
National One Health Platform	
▪ Strong interest from technical people in ministries to adopt One Health approach ▪ Establishment of the National One Health Steering Committee ▪ Key One Health sectors, MoH, MoFCC, MOALR, EWCA included in the structure ▪ Interim leadership for the National One Health steering committee is in place ▪ Apart from the core members, the platform has representation from relevant ministries and non-voting partners such as CDC, USAID, OSU GOHi,WHO, and EPT-2 partners (FAO, P&R, PREDICT, OHW/OHCEA) ▪ The committee has also agreed to include others, such as the MOANR, MOE, and DRM, as needed ▪ Ongoing development of an inter-sectoral collaboration MOU on Zoonosis and other health threats (AMR, food safety, etc.) ▪ Identification of priority zoonotic diseases for inter-sectoral collaboration has been conducted ▪ Technical Working Groups (such as Rabies, Anthrax, AMR) established and are active ▪ Various universities throughout the country provide pre-service and in-service trainings on	▪ NOHSC terms of reference (ToR) not yet endorsed by the Security Council (SC) member institutions ▪ A lack of clarity on the status of the National Health Security Council ▪ Competing priorities lead OHSC members to not fully commit themselves to the committee activities ▪ Lack of an endorsed intersectoral collaboration MOU among the relevant sectors ▪ The committee doesn't include gender ministries ▪ There has not been discussion related to gender so far ▪ Leadership and commitment from the higher government officials is not strong ▪ Absence of a harmonized National One Health Strategy and policy ▪ Poor integration among sectors in data and analysis sharing and communication between the animal and human health sectors ▪ Lack of integration among stakeholders ▪ Limited ownership among stakeholders ▪ Most One Health initiatives are on an ad-hoc basis

One Health (such as Jimma, Mekele, Jigjiga, AAU) ▪ Existing institutional administrative structure (at EPHI, Zoonotic disease research team in both EPHI & MOALR(AMR, food safety and microbiology, PHEM) ▪ Existence of civil society organizations (CSOs) and professional societies that can contribute to One Health	▪ Limited competent workforce at regional level (subject matter expertise) ▪ Lack of clarity in mandates and responsibilities between different ministries ▪ Lack of ongoing advocacy ▪ Poor mapping of efforts contributing to One Health at National level ▪ Poor institutionalization of One Health ▪ Weak capacity of sector offices, as indicated in the JEE in 2016 ▪ Relies heavily on support/technical assistance from USAID-funded Preparedness & Response activity
Communications and Information Exchange	
▪ WHO's JEE assessment has been conducted ▪ Efforts are underway to establish National One Health communication network	▪ The communication among TWGs is not vibrant. Communication and information exchange system is under development. There is no formal information exchange system yet, such as for surveillance and reporting of disease outbreaks. There are mostly informal email exchanges and telephone communications. ▪ There are gaps in communication among the steering committee member organizations. ▪ There is a lack of a mechanism for analyzing and sharing data among One Health institutions. ▪ There is a lack of quality IEC/BCC materials.
Funding Sources and Resource Mobilization	
▪ There are One Health related activities funded by the ministries.	▪ Absence of specific budget to implement One Health plans/activities ▪ Many One Health activities are funded by donors (USAID, CDC); however, the future funding environment is uncertain
Disease Surveillance	
▪ Availability of regulatory system ▪ MoH and MOALR have started collaboration since the Ebola outbreak to test suspect samples ▪ A compliance requirement for laboratories is in	▪ Food-borne disease outbreaks are rarely detected, reported, or investigated, and are seldom traced back to the source of the contagion

place for bio-safety ▪ Have existing animal and human diagnostic laboratories ▪ The country has experience in One Health threats (such as in ULD, H5N1) ▪ There is production of animal vaccine locally	▪ Bio-security lacks national regulation and is limited in its implementation ▪ Limited diagnostic capacity especially at regional level ▪ No local human vaccine production

Table 3: Opportunities and Threats Identified

Opportunities	Threats
Political	
▪ Existence of favorable government policies and good political commitment on human and animal health and the environment ▪ GTP II and aligned sectoral plans (LMP, Tourism Master Plan, CRGE, and HSTP) offer enough support for One Health issues ▪ Possible future establishment of a National Public Health Security Council, and Public Health Emergency Management Institute and technical working groups ▪ Existing One Health initiative in neighboring countries such as in Kenya ▪ GHSA phase 1 country and political commitment to implementation of GHSA agenda ▪ Joint external evaluation already has been conducted	▪ Gaps in implementing pertinent policies and strategies by the respective government authorities ▪ Some stakeholders may not be as supportive as they are expected to be ▪ Weak communication and collaboration between sectors ▪ Gaps in policy and technical collaboration between sectors ▪ Legislative gaps for bio-safety and bio-security ▪ Competing priorities, such as drought and health emergency ▪ Institutional and organizational silos ▪ Weaknesses in the implementation of international health regulations for humans and animals ▪ Lack of clear legislation on public-private partnership pertinent to One Health
Socio-economic	
▪ Improving physical infrastructure–including telecommunications and road network ▪ Continuous economic growth in the country ▪ Improving health and education infrastructure at the community levels ▪ Communities' interest in zoonotic disease approaches, especially in the pastoral areas	▪ High inflation rate and increasing cost of operation ▪ Sustainability issues in approaches on One Health initiatives ▪ Unpredictable nature of zoonotic disease and associated impacts ▪ Internally displaced persons (IDP), refugees,

▪ Improved educational opportunities that will contribute to better outcomes in health and wellbeing ▪ Improving health care seeking behavior of the community ▪ Multiple emerging zoonotic and trans-sectoral diseases gaining attention ▪ Interest from NGOs on One Health approaches ▪ Africa sustainable livestock 2050 program (ASL2050) ▪ Livestock intensification program	import of modified products, medicines, travel ▪ Migration among wildlife and humans ▪ Continuing prevalence of social and economic and environmental factors for the spread of communicable diseases ▪ Lack of awareness of One Health among the general population ▪ Existence of trans-boundary diseases ▪ Requirement of high investment to maintain health of the animals ▪ Cultural influences such as eating raw meat, sharing the same house with animals ▪ Existence of emerging and re-emerging zoonotic disease ▪ Lack of awareness among community members on zoonotic diseases and the impact of climate change
Technological	
▪ Ethiopia is key player in global climate change leadership and the green economy growth	▪ Global warming and environmental degradation ▪ Multiple new threats and climate change ▪ Increasing environmental pollution as result of industrialization
Environmental	
▪ Ethiopia is key player in global climate change leadership and the green economy growth	▪ Global warming and environmental degradation ▪ Multiple new threats and climate change ▪ Increasing environmental pollution as a result of industrialization

IV. THE STRATEGIC APPROACH

4.1. THE PROCESS (REVIEW, ANALYSIS, AND DEVELOPMENT OF THE STRATEGIC PLAN)

Although the country has a long history of multisectoral engagements to detect and respond to zoonotic diseases, there has not been a vibrant mechanism to foster collaboration. Currently, with the involvement of many initiatives and other coordinating mechanisms, the issue of One Health has gained momentum at the national level, especially since the National One Health Steering Committee was established. To keep the momentum and elevate the collaboration of One Health actors at national and regional levels, it was imperative that the national One Health actors have a strategic guide. A thorough review and analysis of the current situation of animal and human health as well as the ecosystem; the wide range of stakeholders that potentially contribute to One Health implementation; and existing One Health policies, strategies, and institutional frameworks has been conducted with the leadership and active involvement of the National One Health Platform in the country. Following review of background data and information, and consultation among sectors and partners, an initial stakeholders workshop was held in October 2017 to initiate development of the strategic plan, including participation from the MoH/EPHI, MOALR, MEFCC, EWCA, NAHDIC, and EFMHCA; development partners such as the WHO, FAO, and CCM; OHWF/OCHEA; and the International Livestock Research Institute (ILRI).

This effort created an opportunity for key actors in One Health at the national level to hold a participatory review and analysis of the strengths, weaknesses, opportunities, and threats outlined in the tables above—including the political, socio-economic, environmental, and technological dimensions that need to be considered in the development of its future strategy. A detailed review on the country profile, socio-economic activities, institutional and policy frameworks, private and civil society, and zoonotic disease is included in Appendices 1-5. Based on this analysis, stakeholders devised the vision, mission, strategic focus, and objectives for the national One Health Strategic Plan and proposed different interventions (activities) that are essential to achieving the desired change.

The USAID Preparedness and Response Project helped to consolidate further inputs from the stakeholders to develop an advanced the draft of the strategic plan, which was further refined during a follow-up stakeholders workshop in December 2017.

4.2. OUR VISION AND MISSION STATEMENTS

4.2.1. VISION

Ethiopia with negligible risks and impacts of endemic, emerging, and re-emerging health threats at the human, animal, and environment interface.

4.2.2. MISSION

To establish sustainable One Health coordination mechanisms at all levels for multi-disciplinary and multisectoral engagement in the prevention, detection, and response to endemic, emerging, and re-emerging health threats at the human, animal, and environment interface.

4.3. OUR VALUES

We, the national One Health actors, defined the following values that reflect the purpose of One Health and the OHSP, promote ethical engagement, and offer moral guidance on the conduct of actors in crisis situations.

1. **Adaptability**: open to bold, innovative strategies; responsive to changing circumstances; ready to take advantage of strategic opportunities; and prepared to share the risks inherent in the work of resisting and transforming oppressive structures and systems
2. **Collaboration**: dedicated to forging collaborative partnerships across a wide range of stakeholders and other coordination mechanisms and partners to achieve shared goals
3. **Accountability:** committed to proving accountability in using resources and rolling out its responsibilities
4. **Sustainability**: determined to make real, lasting improvements in One Health multisectoral approaches
5. **Safeguard the Environment**: committed to promote a culture that recognizes the importance of environmentally friendly practices
6. **Leadership**: we serve with a vision for the future instilled with the highest level of trust to develop and implement an integrated strategy for improved health nationwide
7. **Excellence**: promote the highest standards of excellence throughout the scope of One Health to ensure the development of a transcending culture of quality and continuous improvement at all levels
8. **Integrity**: pursue our mission with commitment, discipline, and rigor at all times and strive for absolute scientific integrity through all communications to ensure the credibility of our work along with the importance of the One Health approaches
9. **Transparency**: we strive for open and interactive communications with and among members, partners, staff, and other stakeholders to create the highest level of ethics throughout our work
10. **Equality & Inclusion**: we are committed to promoting gender equality, cultural sensitivity, and inclusion of disability issues in our approaches
11. **Sense of Urgency**: we are committed to exercising an elevated level of urgency in dealing with public health threats
12. **Ownership**: we, One Health actors, fully undertake individual and collective institutional responsibilities in line with our regular duties and responsibilities

4.4. KEY PILLARS AND STRATEGIC OBJECTIVES

4.4.1. KEY PILLARS

The NOH Strategic Plan has identified the following areas as key pillars to achieve the vision and the mission:

1. Coordination and Collaboration
2. Preparedness and Response
3. Surveillance and Reporting
4. Policy, Advocacy, and Communication
5. Research and Capacity Building

4.4.2. STRATEGIC OBJECTIVES

To achieve our vision, strategic objectives aligned with key pillars have been identified. The strategic objectives identified for the strategic plan period are listed below.

PILLAR ONE: COORDINATION AND COLLABORATION

Objective 1.1. To ensure effective and functional One Health coordination mechanisms at all levels by 2022

Proposed Activities:

- Finalize and endorse an intersectoral collaboration Memorandum of Understanding (MoU) among collaborating core One Health sectors
- Develop a national One Health platform organizational structure
- Endorse and implement the national One Health platform organizational structure
- Operationalize the One Health platform
- Establish and operationalize One Health platforms in all regions and city administrations
- Establish, strengthen, and monitor TWGs for specific emerging and re–emerging health threats

Objective 1.2: To mainstream One Health activities in all relevant government sectors by 2020

Proposed Activities:

- Identify and assign focal persons to coordinate activities
- Allocate budget in respective ministries

- Incorporate One Health initiatives into institutional policies and plans

Objective 1.3: Develop and implement a monitoring and evaluation system for One Health at the national and regional levels

Proposed Activities:

- Develop a monitoring and evaluation plan for One Health in the country
- Supervise activities
- Conduct annual review meetings

PILLAR TWO: PREPAREDNESS AND RESPONSE

Objective 2.1: Establish and strengthen multisectoral and multidisciplinary capacities at all levels for timely detection of and rapid response to emerging and re-emerging priority threats at the human-animal-environment interface by 2021

Proposed Activities:

- Establish multisectoral and multi-disciplinary technical working group and taskforce
- Establish sectoral and intersectoral outbreak rapid response teams
- Establish One Health participatory community level prevention and response appraisal team
- Conduct Vulnerability Risk Assessment and Mapping (VRAM) for each priority threat
- Identify multisectoral capacity need (lab, workforce, and logistics) at national and regional levels
- Allocate budget and resources for prevention and control of threats
- Procure necessary supplies (consumable and equipment) to prepare for and respond to emerging threats
- Provide training and other capacity development support to human and animal health professionals (short-term) at national and regional levels
- Provide capacity building support to vaccine-producing institutions

Objective 2.2: Develop multisectoral prevention and control strategies for priority emerging and re-emerging zoonotic diseases

Proposed Activities:

- Develop and/or update multisectoral and multi-disciplinary preparedness and response plans for priority One Health threats (priority zoonotic diseases, AMR, public health events of initially unknown etiology, and so on) based on VRAM

- Develop and/or revise tools, guidelines, and standard operating procedures for the implementation of the Preparedness and Response plans
- Develop and/or revise national strategic prevention and control plans for priority endemic One Health threats at the human-animal-environment interface

Objective 2.3: Implement and promote multisectoral prevention and control strategies and preparedness and response plans for priority emerging and re-emerging zoonotic diseases using the One Health approach

Proposed Activities:

- Conduct simulations of national Preparedness and Response plans and prevention and control strategies
- Conduct multisectoral after-action reviews (AAR)
- Review national Preparedness and Response plans based on outputs of simulation exercises and after-action reviews
- Pilot implementation of the prevention and control strategies
- Conduct knowledge, attitude, and practice assessments in high-risk areas
- Conduct nationwide implementation of the strategies
- Implement the Preparedness and Response plans in the event of an emerging threat incursion
- Assess the availability, accessibility, and cost-effectiveness of human and animal health insurance

PILLAR THREE: SURVEILLANCE AND REPORTING

Objective 3.1: Establish and strengthen integrated multisectoral surveillance systems by 2022

Proposed Activities:

- Integrate priority emerging and re-emerging health threats into existing sectoral surveillance system
- Develop integrated surveillance guideline for priority diseases or threats
- Establish a multisectoral TWG for integrated surveillance system
- Build capacity on integrated surveillance system
- Conduct regular joint assessment and supportive supervision

Objective 3.2: Operationalize regular sharing and use of surveillance data and information across sectors by 2020

Proposed Activities:

- Harmonize existing databases among all sectors
- Develop data/information sharing policy and protocols across sectors
- Establish mechanism for data/information sharing (electronic, hardcopies)
- Strengthen regular reporting system at all levels and sectors

PILLAR FOUR: POLICY, ADVOCACY, AND COMMUNICATION

Objective 4.1: Improve enabling policy environment across all collaborating sectors for the implementation of One Health by 2022

Proposed Activities:

- Conduct policy gap analysis in all sectors
- Develop national One Health policy and have it endorsed at legislative level
- Integrate One Health approach into sectoral policies

Objective 4.2: Secure high-level buy-in and support for One Health across all sectors

Proposed Activities:

- Sensitize government and partners on One Health approach for buy in and support
- Mainstream One Health activities into sectoral and partner plans
- Identify and allocate budget for One Health activities, outlined in the national One Health strategic plan, in line ministries

Objective 4.3: Improve knowledge, attitude, behavior, and practice of community on health threats or risks at human, animal, and environment interface

Proposed Activities:

- Conduct knowledge, behavior, attitude, and practice survey on populations in high-risk areas
- Develop a risk communication and behavior change communication strategy using a multisectoral approach
- Develop information, education, and communication materials based on the communication strategy developed
- Conduct community-education activities

PILLAR FIVE: RESEARCH AND CAPACITY BUILDING

Objective 5.1: Conduct joint research projects on prioritized zoonotic diseases and other health threats at the animal-human-environment interface by 2020

Proposed Activities:

- Identify priority research topics and develop joint proposals on priority health threats at the human-animal-environment interface
- Conduct studies on priority zoonotic diseases and antimicrobial resistance
- Undertake informed prioritization of zoonotic diseases
- Develop and test key preventive interventions to reduce risk of health threats

Objective 5.2: Improve policy on disease prevention, detection, and response using One Health in line with research findings by 2022

Proposed Activities:

- Prepare policy briefs on One Health
- Conduct research finding disseminations/consultation
- Organize annual One Health national conferences to share information and learning

Objective 5.3: Improve human resource and infrastructure capacity for One Health research by 2022

Proposed Activities:

- Provide trainings to personnel in regional and national laboratories
- Strengthen research laboratory facility
- Develop One Health modules
- Conduct research grant-writing training
- Conduct project management training
- Solicit funds for priority research projects

4.5. CROSS-CUTTING ISSUES

4.5.1. PROMOTING GENDER EQUALITY

The NOH actors recognize the importance of gender equality and will make dedicated efforts to address the needs and challenges of women, men, boys, and girls, at all stages of the project cycle.

4.5.2. PROMOTING ENVIRONMENTALLY FRIENDLY TECHNOLOGIES AND APPROACHES

We care for the environment and will work to minimize the threats posed by climate change. At all times, we will promote and exercise environmental friendliness in our work and mainstream this approach across the range of project portfolios.

4.5.3. INCLUSIVENESS

Understanding the rights of people with disabilities as well as their vulnerability, we are committed to making sure that people with disabilities are meaningfully considered in One Health activities and services.

V. MANAGEMENT AND FUNDING

5.1. MANAGEMENT STRUCTURE

Until the National One Health Platform is institutionalized, the National One Health Steering Committee will oversee the overall management and implementation of this strategic plan. The NOHSC will ensure active participation of line ministries; MoH/EPHI, MOALR, MoCT/EWCA, and MoEFCC; major bilateral, multi-lateral, and donor agencies; and international NGO, CSO, research institutions, and private sector entities involved in the One Health agenda at national and regional levels. After the endorsement and launch of this strategic plan, detailed implementation or operational plans will be prepared and shared among the partners. Different activities proposed in this strategic plan need collaborative actions among institutions. The NOHSC will assign a lead sector or institution to initiate, undertake, and report on specific activities under each pillar and strategic objective, depending on the institutional mandate. The Committee's mandate at the national level will also cascade into the regional or regional levels to play the same role in managing the implementation of the strategic plan in respective geographies.

5.2. FUNDING THE STRATEGIC PLAN

To implement this strategic plan, different resources are required as inputs. While different institutions have their own resources to undertake activities related to One Health, activities proposed in this strategic plan will need additional resources in the form of financing, in-kind contributions, and personnel as highlighted below.

Table 4: Resources Needed for the Implementation of NOHSP

Financial Resources	In-kind Contributions	Human Resources
▪ Costs of training materials ▪ Costs to acquire new equipment ▪ Costs for travel and accommodation	▪ Training/meeting hall ▪ Vehicles ▪ Communication equipment ▪ Office space	▪ Trainers ▪ Resource persons ▪ Time contribution from various professionals

The NOHP will undertake resource mobilization activities to prepare a detailed resource planning, identification, and mobilization strategy. This effort will help the platform to map-out available resources from each partner and seek more resources, if needed, externally from other sources. The resource planning exercise, which will be undertaken at the beginning of the strategic plan implementation period, will be used to define the modalities for the management and reporting aspects of the resources.

VI. MONITORING AND EVALUATION OF THE STRATEGIC PLAN

6.1. DETAILED IMPLEMENTATION (WORKPLAN)

This strategic plan has already proposed a set of activities to be implemented over the strategic planning period. The outputs of these activities are expected to bring the desired results that are vital to achieving the strategic objectives. While this document has an indicative implementation plan for the overall period of the strategic plan, more detailed annual work plans will be required to further breakdown priorities indicated in this strategic plan. The annual work plan will have annual targets with indicators to check the progress. The preparation of the annual work plans will be timely, with active involvement of key participating partners. The annual work plan will also include information on specific portfolios or projects, budgets, and targets by quarter.

6.2. MONITORING AND EVALUATION

For continuous learning, evaluation, and performance measurement, the NOH partners will deploy different strategies for monitoring and evaluating interventions and the overall strategy. The NOHSC will monitor its performance against the prescribed plan and produce quarterly and annual reports. The NOHSC will provide oversight and ensure accountability.

6.2.1. MONITORING

Monitoring enables continual self-evaluation through both formal and informal systems; it is the process of continuously collecting information about the progress of the project to determine whether activities are being implemented as planned and can inform management and implementation adjustments as necessary. NOHP will develop a monitoring and evaluation guide that describes the setup; management processes; standards; strategies; plans; indicators (output, outcome, and impact levels); information-sharing systems; reporting; and accountability relationships that enable each partner to discharge monitoring and evaluation functions smoothly.

6.2.2. EVALUATION

NOHP will evaluate the strategic plan at mid-term. The results of this evaluation will inform the extent of progress made and relevance of the proposed activities toward achieving the intended results as well as its vision. It will also bring vital inputs to the revision of the strategy. At the end of the strategic plan period, a final evaluation will also be conducted, to measure the outcome, impact and effectiveness and will help to identify applicable lessons.

VII. FIVE-YEARS TARGETS AND IMPLIMENTATION PLAN

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
1	**Pillar1:Coordination and Collaboration**									
1.1	Objective 1.1: To ensure effective and functional One Health coordination mechanism at all levels by 2022									
Proposed Activities:										
1.1.1	Finalize and endorse intersectoral collaboration MoU among collaborating core One Health sectors	#	1	1					Endorsed MoU	TBD[16]
1.1.2	Develop a national One Health platform organizational structure	#	1	1					Organizational structure document	TBD
1.1.3	Endorse and implement the national One Health platform organizational structure	#	1	1					Approved functional coordination structures document	TBD
1.1.4	Launching of One Health platform at national level	#	1	1					Reports/minutes of launching workshop	TBD
1.1.5	Establish and launching One Health platform in all regions and city administrations	#	11			5	6		Reports/minutes of launching workshop	TBD
1.1.6	Establish, strengthen, and monitor TWGsfor specific emerging and re–emerging health threats	#	10	5	3	1	1		ToR, minutes, and action plan for all TWGs in place	TBD

[16] To be determined

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
1.2	Objective 1.2: To Mainstream One Health Activities in All Relevant Government Sectors by 2020									
Proposed Activities:										
1.2.1.	Identify key sectors that assign focal persons to coordinate activities	#	8	4	2	2			Nomination letters	TBD
1.2.2	Allocate budget in respective ministries	#	8	4	2	2			Sectorial annual Budget Plan document	TBD
1.2.3	Incorporate One Health initiatives into institutional policies and plans	#	8	4	2	2			Sectorial annual operational plan document	TBD
1.3	Objective 1.3: Develop and implement monitoring and evaluation system for One Health at national and regional levels									
Proposed Activities:										
1.3.1	Develop a monitoring and evaluation plan for One Health in the country	#	**1**	1					Monitoring and Evaluation Plan document produced	TBD
1.3.2	Conduct supportive supervision of activities	Visits	5	1	1	1	1	1	# of supportive supervision visits	TBD
1.3.3	Conduct annual review meetings	Rounds	5	1	1	1	1	1	# of review meetings conducted	TBD
2	**Pillar 2:Preparedness and Response**									
2.1	Objective 2.1. Establish and strengthen multisectoral and multidisciplinary capacities at all levels for timely detection of and rapid response to emerging and re-emerging priority threats at the human-animal-environment interface by 2021									
Proposed Activities:										
2.1.1	Establish multisectoral and multi-disciplinary TWG and taskforce (five regions in the first year, six regions next)	Regions	5 TWGs and 11 regional taskforces	5	6				Number of TWGs and taskforces established	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
2.1.2	Establish sectoral and intersectoral outbreak rapid-response teams	Regions	1 federal and 11 regional response teams	11					Existence of multisectoral outbreak investigation and response teams at all levels	TBD
2.1.3	Establish One Health participatory community-level prevention and response appraisal team	Regions	11		11				Existence of appraisal team at community level	TBD
2.1.4	Conduct vulnerability risk assessment and mapping (VRAM) for each priority threat	Regions	11	11					# of assessments performed	TBD
2.1.5	Identify multisectoral capacity need (lab, workforce, logistics) at national and regional level	Regions	11	11	11				Gaps identified across sectors	TBD
2.1.6	Allocate budget and resources for prevention and control of threats	TBA	TBA						Resources and budget allocated	TBD
2.1.7	Procure necessary supplies (consumable and equipment) to prepare and respond to emerging threats	TBA	TBA						# of procured necessary supplies	TBD
2.1.8	Provide training and other capacity development support to human and animal health professionals (short-term) at national and regional levels	TBA	TBA						# of trained human and animal professionals	TBD
2.1.9	Provide capacity building support to vaccine-producing institutions	TBA	TBA						# of strengthened vaccine-producing institutes	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
2.2.	Objective 2.2: Develop multisectoral prevention and control strategies for priority emerging and re-emerging zoonotic diseases									
Proposed Activities:										
2.2.1	Develop and/or update multisectoral and multi-disciplinary preparedness and response plans for priority One Health threats (priority zoonotic diseases, AMR, public health events of initially unknown etiology, among others) based on VRAM (including Ebola, HPAI, RVF, Plague)	#	5 emerging and re-emerging zoonotic diseases	1	2	1	1		# of P&R plans developed	TBD
2.2.2	Develop and/or revise tools, guidelines, and standard operating procedures for the implementation of the preparedness and response plans	#	5		1	2	1	1	# of guidelines and SOPs developed and revised for P&R	TBD
2.2.3	Develop and/or revise national strategic prevention and control plans for priority One Health endemic threats at the human-animal-environment interface (including Brucellosis, Bovine Tuberculosis, Echinococcosis, AMR, and food safety)	#	5 endemic zoonotic diseases	2	1	1	1		# of strategies developed and or revised	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
2.3	Objective 2.3: Implement and promote multisectoral prevention and control strategies and preparedness and response plans for priority emerging and re-emerging zoonotic diseases using the One Health approach									
Proposed Activities										
2.3.1	Conduct simulations of national Preparedness and Response plans and prevention and control strategies (five emerging and re-emerging disease P&R and five endemic zoonotic disease P&C plans)	#	2	1		1			# of simulations conducted	TBD
2.3.2	Conduct multisectoral after-action reviews (AAR)	#	10	2	2	2	2	2	KAP assessment completed # of AARs	TBD
2.3.3	Review national Preparedness and Response plans based on outputs of simulation exercises and after-action reviews	#	8		2	2	2	2	# of reviews	TBD
2.3.4	Pilot implementation of the Preparedness and Response and prevention and control strategies (five endemic and five emerging and reemerging)	#	10	2	2	2	2	2	#of pilot studies conducted	TBD
2.3.5	Conduct knowledge, attitude, and practice assessments in high-risk areas	#	1	1					# of KAP assessments conducted	TBD
2.3.6	Conduct nationwide implementation of the strategies	#	2		1		1		#of nationwide strategies/plans implemented	TBD
2.3.7	Implement the preparedness and response plans in the event of an emerging threat incursion	#	TBD		X	X	X	X	#of implementation plans	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
2.3.8	Assess availability, accessibility and cost effectiveness of human and animal health insurance	#	2			1		1	Existence of assessment	TBD
3	**Pillar 3:Surveillance and Reporting**									
3.1.	Objective 3.1: Establish and strengthen integrated multisectoral surveillance systems by 2022									
Proposed Activities:										
3.1.1	Integrate priority emerging and re-emerging health threats into existing sectoral surveillance system	#	3	3					Integrated surveillance document	TBD
3.1.2	Develop integrated surveillance guideline for prioritized diseases or threats	#	1	1					Developed guideline	TBD
3.1.3	Establish a multisectoral TWG on integrated surveillance	#	1	1					TWG minute	TBD
3.1.4	Build capacity on integrated surveillance system	#	5	1	1	1	1	1	Training report	TBD
3.1.5	Conduct regular joint assessment and supportive supervision	#	5	1	1	1	1	1	# of supervision visits	TBD
3.2	Objective 3.2: Operationalize regular sharing and use of surveillance data and information across sectors by the year 2020									
Proposed Activities:										
3.2.1	Harmonize existing databases among all sectors	#	3	1	1	1			# of sectors harmonized	TBD
3.2.2	Develop data-/information-sharing policy and protocols across sectors	#	1		1				# of policies and protocols	TBD
3.2.3	Establish mechanism for data/information sharing (electronic, hardcopies)	#	1		1				Data/information sharing operationalized	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
3.2.4	Undertake regular reporting system at all levels and sectors	Week	208		52	52	52	52	# of weeks reports shared/submitted	TBD
4	**Pillar 4:Policy, Advocacy, and Communication**									
4.1	Objective 4.1: Create an enabling policy environment for all collaborating sectors for the implementation of One Health by 2022									
Proposed Activities:										
4.1.1	Conduct policy gap analysis in all sectors	#	1	1					# of report documents	TBD
4.1.2	Develop national One Health policy and have it endorsed at legislative level	#	4		1	1	1	1	# of policy documents produced and endorsed	TBD
4.1.3	Integrate One Health into sectoral policies	#	4		1	1	1	1	# of sectors that have integrated the One Health approach in their policy	TBD
4.2	Objective 4.2: Secure high-level buy-in and support for One Health across all sectors									
Proposed Activities:										
4.2.1	Sensitize government and partner higher officials on One Health approach for buy-in and support	#	3	1		1		1	# of workshop/consultative meetings conducted and follow up reports produced	TBD
4.2.2	Mainstream One Health activities into sectoral plans	#	4		1	1	1	1	# of sectors mainstreamed One Health plan and activities	TBD
4.2.3	Identify and allocate budget for One Health activities, outlined in the national One Health strategic plan, in line ministries	#	TBD						Amount of funding secured as One Health budget – in ETB	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
4.3	Objective 4.3: Improve knowledge, attitude, behaviors, and practice among the country's population on health threats or risks at human, animal, and environment interface									
Proposed Activities:										
4.3.1	Conduct knowledge, attitude, behavior, and practice survey in community in high-risk areas	#	2	1				1	#of surveys conducted and changes in knowledge, attitude, behavior, and practice	TBD
4.3.2	Develop a risk communication and behavior change communication plan using a multisectoral approach	#	1	1					# of BCC plans developed	TBD
4.3.3	Develop information, education, and communication materials based on the communication strategy developed	#	25 IEC X 5,000 copies	1000	1000	1000	1000	1000	# of IEC materials developed and distributed	TBD
4.3.4	Conduct community education activities	#	5 TV/radio programs in 4 languages						#of awareness-raising and education events conducted	TBD
5	**Pillar 5:Research and capacity building**									
5.1	Objective 5.1: Implement joint research projects on prioritized zoonotic and other threats at the human-animal-environment interface by 2020									
Proposed Activities:										
5.1.1	Identify priority research topics and develop joint proposals on priority health threats	#	5	1	1	1	1	1	# of priority research topics identified	TBD
5.1.2	Conduct research on priority zoonotic diseases and antimicrobial resistance	#	5	1	1	1	1	1	Volume of research conducted	TBD

Ref #	Pillars, Strategic Objectives and Proposed Activities	Unit	5-year target	Targets by Year					Success indicators	Budget & Source
				2018	2019	2020	2021	2022		
5.1.3	Undertake informed prioritization of zoonotic diseases	#	3			1	1	1	# of workshops conducted and priority zoonotic diseases identified/re-identified	TBD
5.1.4	Develop and test key preventive interventions to reduce risk of health threats	#	5			3	2	1	# of interventions tested on priority health threats	TBD
5.2	Objective 5.2:Improve policy on disease prevention, detection, and response using One Health approach in line with research findings by 2022									
Proposed Activities:										
5.2.1	Prepare policy briefs on One Health approach	#	8		2	2	2	2	# of policy briefs finalized	TBD
5.2.2	Research finding disseminations/consultation to improve legislation	#	2		1		1		# of consultative workshops, major piece of legislation changed /developed	TBD
5.2.3	Organize annual One Health national conferences to share information and learning	#	5	1	1	1	1	1	# of annual One Health conferences conducted	TBD
5.3	Objective 5.3: Improve human resource and infrastructure capacity for One Health research by 2022									
Proposed Activities:										
5.3.1	Train personnel in regional and national research laboratories/Institutions	#	400	50	50	50	50	50	# of trainees	TBD
5.3.2	Develop One Health modules	#	5	1	1	1	1	1	#of modules	TBD
5.3.3	Strengthen research laboratory facility	#	40	10	10	10	10		# of laboratory facilities	TBD
5.3.4	Conduct research grant-writing training	#	5	1	1	1	1	1	#of training sessions and trainees	TBD
5.3.5	Conduct project management training	#	3	1		1		1	#of training sessions and trainees	TBD
5.3.6	Solicit funds for priority research projects	#	TBD	X	X	X	X	X	Amount of funding secured	TBD

VIII. APPENDICES

APPENDIX 1: GENERAL COUNTRY PROFILE

Geography

Ethiopia is a country in the Horn of Africa bordering Somalia and Djibouti to the east, Eritrea to the north east, Sudan and South Sudan in the northwest and West and Kenya in the south. The total area of the country is 1,104,300 square kilometers (KM)—about 1 million square KM are land, while water covers the remaining 104,300 square KM. Its topography features high plateaus with a central mountain range separated by Great Rift Valley. This varied topography has induced heterogenic climatic conditions. The country is host to two extreme elevations—Ras Dashen Mountain (4,550 meters above sea level) and the Danakil Depression (125 meters below sea level)[17].

POPULATION AND DEMOGRAPHIC CHARACTERISTICS

Ethiopia is the second-most populous country in Africa and the 13th in the world, with a population growth rate of 2.6 percent. According to the 2017 estimate by Central Statistics Agency (CSA), Ethiopia has a population of more than 94.4 million people (50.2 percent female and 49.8 percent male)[18]. Eighty percent of the country's population lives in rural areas (CSA, 2017). Urbanization is also increasing, having grown at a rate of 4.78 percent annually during the period 2011–2015. Due to its diverse climatic conditions, the country's population density varies across the country, with the highest in the highlands north and middle areas of the country, particularly around the centrally located capital city, Addis Ababa.The lowland, pastoral, and agro-pastoral areas are sparsely populated.

ECONOMY

Ethiopia is one of the world's oldest civilizations and one of the fastest-growing countries in Africa. However, the country is still on the list of poorest countries, with per capita income of about $660, which is lower than the regional average[19]. Ethiopia is one of the 48 Least Developed Countries (LDC)[20] and one of the 31 Low Income Countries (LIC)[21].The government of Ethiopia aspires to drive the country to middle-income status over the next decade. The country's economy has recorded consistent and broad-based growth, with an average of 10.8 percent per year during the period 2004–2015. The recorded average annual growth was double the regional average of 5.4 percent (World Bank, 2017). According to the Ethiopia Socioeconomic survey conducted by World Bank and CSA, agricultural activities (farming or livestock) are practiced by 98 percent of rural households[22]. Agriculture is vital for Ethiopia's

[17] Central Intelligence Agency (CIA), World Fact Book: Ethiopia (2017)
[18] FDRE Central Statistics Agency, Country Population Projection (2017)
[19] World Bank, Country Overview: Ethiopia (2017)
[20] UN, Classification for Least Developed Countries (2017)
[21] World Bank, Classification of Countries by Income Level (2017)
[22] World Bank and CSA, Ethiopia Socio-economic Survey (ESS) (2016)

economy, accounting for 42-45 percent of the gross domestic product and 80 percent of total employment[23].

Although progress has been made in past decades, gaps still exist in the economic, health, and wellbeing indicators. Hence, growth transformation is on the forefront of the state agenda, also gaining significant endorsements by and contribution by different actors, including multilateral and bilateral cooperation and other non-state actors. This growth and transformation movement has been strategically guided by the Growth and Transformation Plan (GTP) that is being reviewed and updated every five years. Review of the implementation of GTP I showed positive improvements in both the social and economic fronts, especially in education and health sector development. It also showed that ever-increasing inflation and development financing have been the key challenges to the implementation of GTP1. Taking a practical lesson and incorporating emerging issues, GTP II has set out ambitious goals, with the economic growth, agricultural production and manufacturing and infrastructure development taking special emphasis.

INFRASTRUCTURE

The country has made progress at a significant scale in terms of telecommunication. The number of mobile telephones has grown to more than 50 percent, which puts the country at an improved rank of 41st among countries. However, access to mass-media outlets and internet is still very low. The recent demographic and health survey reported that 74 percent of women and 62 percent of men have no access to radio, television, or newspapers on a weekly basis—and only 5 percent of women and 13 percent of men have ever used the internet[24].

As a landlocked country, Ethiopia uses the ports of Djibouti in Djibouti, Berbera in Somalia, and the Port of Sudan in Sudan. Road infrastructure has improved over the last decade, and as of 2015, the country reported a total of 110,414 KM of all-weather roads. An electricity-powered railway that covers 659 KM, connecting the capital Addis Ababa to the country's major port of Djibouti, was inaugurated in 2017. With 20 domestic airports in 2014/15, the country's flag carrier, Ethiopian Airlines, connects Addis Ababa to the country's regional and other major towns and tourist destination sites. Even if the country is now implementing an ambitious plan to upgrade electricity generation from renewable sources of energy, hydropower, including the Great Ethiopian Renaissance Dam, currently only 93 percent of urban households and 8 percent of rural households have access to electricity (CSA and ICF, 2016).

While remarkable progress achievedover the past decade, access to safe drinking water persisted as a challenge for the rural households. Only 57 percent of rural households have access to an improved source of drinking water, as compared with 97 percent of the urban households. Sanitation and hygiene practices were reported to be poor. According to the recent demographic and health survey conducted in the country (CSA and ICF, 2016), washing agents were seen only in 28 percent of urban households and 7 percent of rural households.

[23] IDRC, Adaptation to Increase Resilience to Climate Change in Ethiopian Agriculture (2017)
[24] CSA and ICF, Ethiopia Demographic and Health Survey 2016 (2016).

ENVIRONMENT AND ECOLOGY

The country has a diverse ecosystem with varied flora and fauna as well as microbial sources. As per the Ethiopian Biodiversity Institute, the country's major ecosystems are Afroalpine and subafroalpine, Montane Dry Forest and Scrub, Montane Moist Forest, Acacia-Comiphora Woodland, Combretum-Terminalia Woodland, Lowland Humid Forest, Aquatic, Wetland, Montane Grassland, and Desert and Semi-Desert Ecosystems[25]. The major environmental issues facing Ethiopia include deforestation, soil erosion and depletion of nutrients in the soil which, in parts of the northern highlands, are leading to a worrying increase in desertification. Drought also occurs often and the economy's heavy reliance on rainwater amplifies its effects, resulting in severe food shortages and malnutrition.

BIODIVERSITY

Because of the socio-economic and cultural diversity and complex topography, Ethiopia is explicably one of the genetic resource richest countries in the world in terms of crop diversity, and is known as one of twelve Vavilov Centres of primary plant domestication globally. It is also an origin for many crop plants including *Coffea Abyssinica*, Safflower, *Carthamus Tinctorius*, 'tef,' *Eragrostis Tef*, 'noog', *Guizotia Abyssinica*, 'anchote', *Coccinia Abyssinica*. Relatives of some of the world's important crops with enormous genetic diversity are abundant in the Ethiopian region[26]. The country has also rich biodiversity in terrestrial and aquatic resources including 277 species of mammals, 861 species of birds, 78 species of reptiles, 54 species of amphibians and 101 species of fishes. Vegetation types in Ethiopia are highly diverse ranging from afro-alpine to desert vegetation. The Biodiversity Institute reported that the country has many plant species and a recent work shown that the number of higher plants was over 7000 species from which 12 percent are endemic(Ethiopian Biodiversity Institute , 2017).

CHALLENGES TO BIODIVERSITY

Human activities have reduced biodiversity in Ethiopia, and caused greatest threat to loss of habitat as they develop land for agriculture, grazing livestock, and unsustainable use such as draining wetlands and encroaching on forests for agricultural land and polluting the air, soil, and water through poor use of chemical compounds such as herbicide, insecticides, etc. As human population increases and their encroachment on natural habitats expands, humans are having detrimental effects on the very ecosystems on which they depend. In the Ethiopian context, the most drastic damage has occurred in the natural high forests and their biological resources that once covered 35 percent of total area of the land in the country (Ethiopian Biodiversity Institute , 2017). The World Bank reported the coverage (forest area % of land) in 2015 to be 12.5 percent[27].

Habitat human encroachment especially in tropical regions results in interface with wildlife and can lead to the creation of "hot spots" for the emergence of new pathogens, with potential for rapid spread among susceptible human populations, through rapid means of travel and wildlife trafficking.

[25]Ethiopian Biodiversity Institute, Diversity of Ecosystems (2017)
[26]Ethiopia Biodiversity Institute (Accessed Online – October 2017)
[27]The World Bank, Forest Area % of Land (2015) (Accessed Online – October 2017)

PROTECTED AREAS AND THREATS TO THE ECOSYSTEM

Protected areas in Ethiopia include 21 national parks, four wildlife sanctuaries, eight wildlife reserves, 20 controlled hunting areas, six open hunting areas, six community conservation areas, and 58 national forest priority areas[28]. These protected areas have been playing key roles in the economic, ecological, and social structure of the community.

Threats to the ecosystem and biodiversity in Ethiopia include the loss of habitat, as humans develop land for agriculture, grazing livestock, draining wetlands, eutrophication of water bodies and poor use of pesticides. The increased pressure of human populations on natural habitats is having a detrimental effect on the ecosystems, especially in the country's high-altitude forests and their biological resources that once covered more than 42 million hectares--35 percent of the total land area of the country. Unsustainable use (over grazing/browsing, harvesting, and hunting) of biological resources is one of the major threats to biodiversity and ecosystems in Ethiopia[29]. In addition to an elevated level of encroachment for agricultural expansion, other key factors posing threats to the ecosystem include a change in land use, degradation, population growth, infrastructure development, climate change, pollution, and poverty. The government of Ethiopia (GoE), as part of GTP II, has planned to tackle the problem by developing alternative energy to enable the public to benefit from modern energy, expanding renewable energy sources that are clean and carbon-free and expand biomass energy, thereby reducing fuel wood consumption, reducing deforestation, and protect desertification.

The GoE has introduced Climate Smart Agriculture (CSA), as part of its long-term commitment, called the Climate Resilient Green Economy (CRGE). Through the CRGE Strategy, the country aims to achieve resilience to the negative impacts of climate change, reduction of greenhouse gas emissions, and transformation of its economy to a middle-income country. Currently, agricultural practices promote different interventions for protecting the environment. Every investment or infrastructural development project is subject to an environmental and social impact assessment[30].

CLIMATE

Ethiopia is in the tropics on the Northern Hemisphere and is dominated by the Intertropical Convergence Zone (ITCZ) and two moist wind systems, blowing from the Atlantic and Indian Ocean respectively. In addition, there are climatic variations over relatively short distances in response to relief and elevation differences. As a result, the climatic conditions of Ethiopia vary from hot dry conditions in its Afar and Ogaden deserts to cold moist conditions on its mountain peaks in the Simien Mountains and Bale Mountains National Parks. The highest mean annual rainfall surpasses 2,400 mm in the western highlands in the Illuababora Zone of the Oromia Region. The amount of precipitation gradually decreases to about 600 mm in the north in areas bordering Eritrea, and then drops to less than 100 mm in the northeast in the Afar depression, and to around 200 mm in the southeast in the Ogaden.[31]

[28]Young J., Ethiopian Protected Areas: A Reference Guide for Future Strategic Planning and Project Funding
[29] Belay Zerga, Ecosystem Degradation Nexus in Ethiopia (2015)
[30] MoANR, Climate Smart Agriculture (2015)
[31] National Methodological Agency, Climatology Data: Ethiopia (2017)

APPENDIX 2: SOCIO-ECONOMIC ACTIVITIES

LIVESTOCK

Ethiopia has the highest livestock population in Africa. It offers a livelihood means for 65 percent of the population. According to recent estimates, Ethiopia has 59.5 million cattle, 30.70 million sheep, 30.20 million goats, 2.16 million horses, 8.44 million donkeys, 0.41 million mules, 1.21 million camels, and 56.87 million poultry[32]. These estimates do not include livestock populations in the pastoral (nomadic) areas of the Afar and Somali regional states. The predominant livestock production system in Ethiopia is extensive, where indigenous breeds are kept under low-input/low-output husbandry practices. Several factors and livestock mortality rates constrain the productivity of this sector: death estimates for the 2014/2015 fiscal year were 3.23 million cattle, 4.37 million sheep, 4.90 million goats, 18,231 camels, and 41,195 chickens (CSA, 2015). To fully use the untapped livestock potential and address food-safety issues, the government has created the Ethiopia Livestock Master Plan (LMP). The animal health part of the plan calls for establishment of a robust animal health information system; reduced production losses by controlling prioritized diseases; increased export earnings by reinforcing the quarantine, inspection, and certification system; decreased impact of zoonotic diseases on public health by controlling them and ensuring safety of animal products; improved infrastructure; and discussion of policy issues.

EXTRACTIVE AND NATURAL RESOURCE INDUSTRIES

Ethiopia is known to have an ancient history of mining and a wide range of mineral resources. According to information obtained from the Ethiopian Extractive Industries Transparency Initiative (EEITI), minerals including gold, platinum, nickel, and other base metals; rare metals such as tantalum, gemstone such as opal, beryl, Amethyst, peridote and others; soda ash, potash and industrial minerals; colorful dimension stonesand huge deposits of silica sand, cement, and ceramic raw materials; and several hot spring and mineral water potential areas.

TOURISM

In the last decades, there has been tremendous growth in the number of tourists in the country, which grew by 3.1 percent in 2016[33]. Tourism contributes about 4.2 percent of the country's GDP and 3.8 percent of the total employment. While the country is home to wide range of unique natural, cultural, and historical tourism resources, the lack of consideration for the needs of the tourism sector while drawing up health sector planning and policies and poor law-enforcement practices in the wildlife-protected areas were among the critical gaps identified by the Ministry of Culture and Tourism during the development of the 10-year roadmap (Tourism Masterplan, 2015-2020) for the country, which is currently under implementation.

[32] CSA, Agricultural Sample Survey: Ethiopia (2016/17)
[33] WTTC, Travel & Tourism Country Economic Impact: Ethiopia (2017)

TRADITIONAL HEALING AND MEDICAL PRACTICES

Traditional medicine and healing practices are inherent in Ethiopia. The acceptance of the traditional healers and the lack of access to modern healthcare are among the key reasons behind the proliferation of traditional medicine and healing practices (Sadik EA, 2011). Dependence on traditional medicinal plants, different spiritual beliefs, poor treatment-seeking behavior due to misconceptions, and considering first aid as anti-viral treatment were among the key factors contributing to human rabies cases in Ethiopia.

APPENDIX 3: STRUCTURES AND INSTITUTIONAL FRAMEWORK FOR HUMAN AND ANIMAL HEALTH

GENERAL OVERVIEW ON INSTITUTIONAL FRAMEWORK

The recent Joint External Evaluation (JEE) for Ethiopia, conducted in March 2016 by the WHO, saw the existence of a strong political commitment by the GoE to improve the public health system and animal health system through the Ministry of Health (MoH) and Ministry of Livestock and Fishery (MOALR) respectively. Both the human and animal health systems have good capacity in the establishment of diagnostic laboratories, surveillance, and responses. During the assessment, there were gaps in communication and collaboration between the animal health and public health sectors—and an absence of formal or legal linkages, structures, or policies for working with other sectors such as wildlife and agriculture.

INSTITUTIONAL AND POLICY FRAMEWORKS FOR HUMAN AND ANIMAL HEALTH

The health system is expected to cope with existing and emerging disease epidemics, acute malnutrition, and natural disasters of national and international concerns. The Ethiopian Public Health Institute (EPHI) set up a Public Health Emergency Management (PHEM) system since 2009 that handles PHEM activities in the country. The PHEM center offers laboratory support to public health emergencies in the identification of diseases or other emergency conditions. Integrated Disease Surveillance and Response (IDSR) has been incorporated as one pillar in the PHEM system under the EPHI and is implemented at all levels. The PHEM oversight cascades down to the regional level through regional health bureaus, with their zonal health departments and district health offices. Through this system, priority diseases and events have been found for weekly and immediate reporting from the level of health post upwards. Twenty-two immediate and weekly reportable diseases were selected, of which six are zoonotic. An International Health Regulation (IHR) core capacities assessment was done and the identified gaps are addressed through IDSR implementation.

The animal disease surveillance and reporting is poor and irregular, with only about 30–35 percent of Woredas submitting disease outbreak reports each month. That figure is below 5 percent for pastoral and agro-pastoral areas. Moreover, the sensitivity, specificity, and timeliness of the reports are very low, as per the information presented in the LMP of the country.

MINISTERIAL STRUCTURE AND ROLES FOR HUMAN, ANIMAL, AND ENVIRONMENTAL HEALTH

Human Health Sector

The Ministry of Health (MoH) owns the oversight and management responsibility of the health system at national level. Regional Health Bureaus also share the mandate within their administrative ranges. The MoH and Regional Structures follow decentralized system and responsibilities, authorities, powers, and resources are shared across the various levels, including zonal and Woreda offices of health. The Public Health Institute (EPHI), the institution accountable to the MoH, set up and is now leading the Public Health Emergency Management (PHEM) System. The PHEM System is the body responsible for PHEM

activities in the country. The PHEM System is backed up by a center that gives laboratory support to public health emergencies in the identification of diseases or other emergency situations.

Ethiopia, as one of the United Nations (UN) member states, adopted and is implementing the WHO/AFRO IDSR Regional Strategy. The implementation of this strategy is practical at all levels and involves carrying out disease surveillance activities using an integrated approach, collecting, analyzing, interpreting, and reporting data on all important diseases in the *same* way, by the *same* people who normally send routine report forms on health-related data.

The review conducted by the MoH during the revision of the Health Sector Development Plan (HSDP IV) showed that the implementation of the IHR and the preparation and readiness for the potential threat of Ebola is commendable, while it also showed areas of improvement for the system, including the gaps in multisectoral coordination, delays in sharing reports or notifying reportable diseases. While the federal and regional level structures prove adequate capacity and preparedness, the MoH has reflected that there is still a big gap at Woreda levels, especially a lack of clear planning and insufficient budget distributed for emergencies, barriers for communication, and reporting on public health emergencies.

Ethiopia has a National Health Policy that guides the health sector. To realize the health policy, the country has been implementing a 20-year health sector development program (HSDP I-IV). The health sector is developing a long-term strategy (envisioning Ethiopia marching toward universal health coverage through primary health care). Currently the country has started implementing a new health sector transformation plan and revising its health policy. The health sector has been organized into different echelons, such as health service provider, purchaser, and regulator. The health system has threetiers. The *primary health care units* (PHCUs) comprise health posts, health centers, and primary hospitals. They are structured to provide health services to 3,000-5,000, 15,000-25,000, and 60,000-100,000 populations, respectively. The secondary health service delivery structure consists of *general hospitals* that serve 1-1.5 million people; and the tertiary health care delivery is provided by *specialized hospitals* that serve 3.5 – 5 million people. There has been massive expansion of public and private health and pharmaceutical institutions. This health extension program, which has deployed more than 38,000 health extension workers supported by the health development army, links the health system with the community level and creates easy access for the population.

Since 2004, Ethiopia has been implementing the Health Extension Program (HEP), one of the most innovative community-based health programs in Ethiopia. HEP has played a pivotal role in improving access to essential services in addition to creating awareness and demand for health care services in rural communities through transfer of health knowledge and skills to households. It has had a tangible effect on the thinking and practices of rural people about disease prevention, family health, hygiene, and environmental sanitation, by deploying Health Extension Workers (HEW) per the lowest administrative level. The recent introduction of the Health Development Army (HDA), a community mobilization strategy to scale-up health service delivery, has also increased the momentum of program implementation and outreach services. Currently, the second generation of the HEP is in effect, emphasizing upgrading the skills of HEWs; renovating, expanding, equipping, and supplying health posts with the necessary equipment and supplies; shifting essential services to the community level; and institutionalizing the HDA platform.

Since 2011, Ethiopia has been implementing the Community-Based Health Insurance (CBHI) scheme to ensure universal health coverage, promote fair access to sustainable quality health care, increase financial protection, and enhance social inclusion. The CBHI gathers payments made by members into a fund that covers basic health care costs at local health care centers whenever any member of the group is sick.[34] However, the CBHI has not widely reached the population. According to the Demographic and Health Survey conducted in 2016, overall, 95 percent of women and 94 percent of men ages15-49 are not covered by any type of health insurance. Less than 1 percent each of women and men are covered by social security insurance, and less than 1 percent of women and men have employer-based insurance coverage (CSA and ICF, 2016).

DISEASE SURVEILLANCE SYSTEM FOR HUMAN HEALTH

The surveillance of human disease is conducted by the Ethiopian Public Health Institute (EPHI), which is under the Ministry of Health (MoH). In the EPHI, the department of Public Health Emergency Management (PHEM) handles human diseases/health surveillance, the department of Nutrition and Food Science handles inspection of hotels and other food catering firms, and the department of Zoonoses carries out surveillance of zoonotic diseases.

Animal Health

Regarding animal health, the MoALR is the mandated government office for livestock production, preventing animal diseases, and overseeing issues related to the development of pastoral areas. The Livestock Master Plan (LMP) for the country showed that both the coverage and quality of animal health are inadequate. There are 15 animal health diagnostic laboratories, including the National Animal Health Diagnostic Laboratory, in various parts of the country that are supporting the surveillance system. The National Veterinary Institute, an enterprise under the MoALR, is mandated to produce vaccines against various animal diseases and supply the local and international demand especially from African countries. The shortage of private veterinary service providers, including private veterinary pharmacies, Community Animal Health Workers (CAHWs), and veterinary drug importers and distributors, is among the critical challenges facing the livestock sector and animal health. The Veterinary Drug and Feed Administration and Control Authority (VDFACA) was also set up in 2015 to control the quality of all veterinary and animal feed products imported and distributed in the country for animal use. The GoE, under GTP II, has set a huge milestone to upgrade the coverage of animal health services by increasing the production of livestock quality vaccines that meet international standards; covering vaccinations based on risk level and *Woredas*' monthly livestock disease outbreak reporting rate; and covering animal clinical services.

Disease Surveillance for Animal Health

Livestock disease surveillance is carried out at both the federal and regional levels in Ethiopia. At the federal level, the Epidemiology Directorate under the Ministry of Agriculture and Livestock Resources (MoALR) guides overall surveillance activities and central animal health data collection, collation, analysis, and dissemination. The Ministry uses a web-based passive epidemiological surveillance system

[34] CHMI, Ethiopian Community Based Health Insurance (Accessed online –October 2017)

called disease outbreak and vaccination report (DOVAR II) to gather, edit, and store data in a database on regular basis from all over the country.The data can then be analyzed to improve understanding of the disease situation in the country, determine appropriate prevention and control measures, and report to country and international stakeholders. The information collected from all over the country will be submitted using this site, and the Ministry of Agriculture and Livestock Resources has the mandate to generate reports and analyze the data accordingly. To strengthen the passive surveillance system, the ministry has introduced a new mobile-based real-time reporting system called Animal Disease Notification and Investigation System (ADNIS) in selected pilot sites (280 districts), which can provide functions for capturing, management, analysis, interpretation, and dissemination of Trans-boundary Animal Diseases (TADs)-related data on identified notifiable diseases. It serves for immediate notification and early detection of selected animal diseases, including anthrax.

The National Animal Health Diagnostics and Investigation Center (NAHDIC) conducts and coordinates surveillance activities, in addition to serving as a referral diagnostic center and guiding regional veterinary laboratories. Besides the routine bacteriological, serological, and parasitological procedures that are being conducted in NAHDIC and RVLs, diagnosis and investigation of highly pathogenic agents like HPAI and other zoonotic diseases are carried out at NAHDIC, and cell culture and feed analysis is carried out at NVI.

The National Veterinary Institute (NVI) provides a diagnostic and surveillance service for emergency preparedness, in addition to its main mandate of vaccine production. The National Institute for Control and Eradication of Tsetse and Trypanosomosis Center (NICETT) and the South Tsetse Eradication Project carry out surveillance of tsetse-borne and non-tsetse trypanosomosis. At the regional level, regional veterinary laboratories conduct surveillance and diagnoses in their respective regions. Slaughterhouses, disease control and eradication projects, quarantine stations, checkpoints, and international entry and exit ports are also involved in active and/or passive surveillance activities[35].The Veterinary Public Health Directorate of the MoALR handles inspection of meat, milk, and farms for food-borne and zoonotic diseases.

Ministry of Culture and Tourism – Ethiopian Wildlife Conservation Authority (EWCA)

As one of the core institutions critically involved in issues pertinent to the One Health, the Ministry of Culture and Tourism (MoCT), Ethiopian Wildlife Conservation Authority (EWCA) has an extended structure down to the Woreda levels and implements government policies and programs for the sector, including issues related to conservation and wildlife. EWCA was set up by proclamation No. 581/2007 as an independent authority under the Ministry of Culture and Tourism, with a mandate to administer national parks and wildlife sanctuaries. The EWCA administers 13 national parks and eight wildlife reserves of the country and regulates the hunting industry.

[35] Ministry of Agriculture, Ethiopian Animal Health Year Book, 2012)

Ministry of Environment, Forest and Climate Change (MoEFCC)

The MEFCC is mandated to formulate, improve, and implement policy, strategy, and programs related to environment and climate change issues. The ministry, providing support to regional states and city administrations, works with different multilateral, bilateral, and NGO programs and projects related to climate change resilience. During the GTP I period, the Climate Resilient Green Economy (CRGE) strategy was formulated to embark on building a green economy. To implement the CRGE, new institutions and/or organizational structures have been put in place since then. Key among these is the establishment of the Ministry of Environment and Climate Change to oversee and coordinate the implementation of the CRGE strategy. Formulating and effectively implementing environmental strategies and laws are essential to accelerate the process of building a climate resilient green economy.

The Ministry of Agriculture and Livestock Resources (MoALR) recently introduced Climate Smart Agriculture (CSA) as part of its long-term commitment under the CRGE. Agricultural practices consider the impact on climate change through promoting different interventions for protecting the environment. Every investment or infrastructural development project is subjected to an environmental and social impact assessment. Besides protecting environment, there are multiple initiatives underway in the agricultural extension, including watershed management, natural resource conservation, and forestation. These regular practices, coupled with interventions introduced by food security programs, such as the public works by the Productive Safety Nets Program (PSNP), yielded improved resilience among the smallholder farmers in major Regions in Ethiopia[36]. In addition to increasing the income for participating households, the public works are increasing land productivity by reducing erosion. Drought has affected agricultural practices and livelihood for smallholder farmers in various parts of the country. Even if the environmental protection and rehabilitation efforts are increasing, there are gaps in early-warning mechanisms and in the promotion of technologies and varieties that are adaptable to climate change incidences, such as drought. The environmental protection, conservation, and rehabilitation initiatives being undertaken can have a positive impact on the ecosystem and thereby the health of animal and human beings.

Food Safety Stakeholders

Actors for food safety are the MoALR, MoH, slaughterhouses, food manufacturers, food traders, food inspectors, animal and human health experts, producers such as farmers or pastoralists, consumers, and professional associations such as the Ethiopian Veterinary Association (EVA), the Ethiopian Public Health Association (EPHA), EPHI, and the Ethiopian Standards Agency (ESA). The main stakeholders for food safety and zoonoses include the MoALR, MoH, and ESA. Directorates under the State Ministry of Animal Health and Fisheries that are directly or indirectly involved in food safety include the Veterinary Public Health Directorate, the Export Abattoirs Inspection and Certification Directorate, the Quarantine Inspection and Certification Directorate, and the Livestock Identification and Traceability Directorate.

[36] Care Ethiopia, Analysis of Stakeholders Involved in the Agriculture Sector (2017)

Other stakeholders for food safety include VDFACA at the MoALR, which has laboratories that test raw animal products for residues and microbes; the Ethiopian Food, Medicine, and Health Care Administration (EFMHCA) and EPHI from the MoH; and ESA. The Ministry of Trade and Industry and the Ethiopian Manufacturing Industries Association are also involved in organizing training, setting standards, and drafting regulations with MoH and MoALR, especially for export food items.

APPENDIX 4: PRIVATE AND CIVIL SOCIETY (CSO) SECTORS

ROLE OF PRIVATE AND CIVIL SOCIETY SECTORS IN ONE HEALTH

Even though veterinary drug importation has been liberalized and the investment law fully accepts the establishment of private veterinary practices, pharmacies, and drug shops, economic viability is a challenge for veterinary entrepreneurs. The Livestock Master Plan for Ethiopia has specified that growth of private animal health service delivery is constrained by the absence of an enabling environment and competitive, subsidized delivery of public animal health services, supplies, and drugs. Developing and promoting guidelines for veterinary information and disease outbreak reporting systems, including the obligations of private practitioners from village to national level and strengthening public private partnership in animal health services is needed to promote the role of Civil Society Organizations (CSO) and private sector.

The private health sector plays a significant role in the provision of healthcare services in the country. Based on the National Health Accounts Report[37], it is estimated that the private health sector accounts for more than 40 percent of the curative and rehabilitative services in the country. With Ethiopia's growing economy, the private sector's share in the National Health Service delivery is expected to grow quickly. The private sector in the country, in public health services, is diverse, fragmented, and not well organized, and quality of services is often inconsistent. Both private for-profit and private non-profit organizations can contribute to One Health solutions if supported, by combining the resources and innovative power of business with the knowledge and experience of the development field. Civil society actors are playing a crucial role in the delivery of services in certain dimensions of the One Health focus issues. The sector's existing legislation, Charities and Societies Proclamation 621/2009, supports the engagement of Charities and Societies in the health system. Accordingly, the sector brings a significant amount of resources from multilateral and bilateral sources and private foundations to implement programs and services.

In both private and civil society sectors, associations—including the Veterinary Association, Public Health Association, Pharmaceutical Association, Medical Association, Crop Production and Protection Associations, and Private Hospitals Association—have a significant presence and participation in the formulation of different policies and programs that the government leads. One of the major reasons for the lack of adequate engagement and contribution by the private sector in One Health issues is the lack of awareness on the importance as well as lack of technical and financial capabilities. If these limitations are addressed, the sector will be able to contribute to the prevention, detection, and treatment of diseases or the OHP's agenda in general.

[37] MoH, National Health Accounts Report for 2010-11 (2014) (Online (Accessed Online–October 2017)

Table A1: Potential Roles of the Private Sector in Preparedness, Prevention, and Response

Private Sector	Potential Roles	Incentives to the Sector	Value to One Health
General	▪ Public health measures at the facility – potable water, sanitation, hand washing ▪ Proactive exposure/transmission reduction on the work site	▪ Ensure that the country is prepared for future outbreaks ▪ Maintain healthy work forces ▪ Ensure that the economy continues to run, and that ports and borders remain open	▪ Establish a network of companies that are familiar with the national preparedness and response plan ▪ Disease transmission control at the workplace ▪ Ensure that the economy continues to run
Livestock, Poultry, and Dairy Producers and Other Agri Farms	▪ Contribute to policy and plan development, prevention measures, dissemination of information on prevention measures; take part in local simulations, review of preparedness and response plans ▪ Biosecurity, surveillance ▪ Educational campaigns, information dissemination	▪ Ability to shape policy and plans to the advantage of members, particularly with respect to reducing risk of zoonotic disease spread, biosecurity, AMR, and culling ▪ Ensuring business continuity to be able to bring products to market and export ▪ Avoid disease among animals and birds to ensure their own productivity ▪ Ensuring business continuity to be able to bring products to market	▪ Mechanism to give information ▪ Zoonotic disease control at the source
Tourism (Hotels, Tour Guides)	▪ Event-based surveillance of wildlife; simulations; ensuring business continuity plans are consistent with national/local preparedness and response plans	▪ Economic incentive to eliminate or minimize any outbreaks among people or wildlife ▪ Keep tourists happy and healthy;	▪ Mechanism to disseminate information ▪ Disease transmission control among

	▪ Public health measures at hotels and tourist destinations and information dissemination about best practices ▪ Educating employers and employees about communicable disease/outbreaks; business continuity planning	avoid perception of disease or anything that could be perceived as a risk to tourists ▪ Minimize perception of risk to tourists; understand and control the message	visitors
Logistics and Transport	▪ Educating public sector about logistics, medicine distribution; MOU for outbreaks ▪ Transport of people, equipment, material, samples, medicines	▪ Potential contracts, perception of working with the government to solve issues ▪ Revenue	▪ Ensure that MOUs are set up before an outbreak occurs ▪ Efficient means of ensuring of collection/distribution of samples and/or materials
Laboratories	▪ MOU for outbreaks; procedures for sample handling, transport, and disposal; simulations; contribute to P&R plan to ensure that it address laboratory issues; provide expert advice in development of sampling/analytical protocols ▪ Conduct diagnostic testing	▪ Potential contracts ▪ Revenue	▪ Ensure that there are set up relationships with laboratories before an outbreak occurs ▪ Rapid and efficient mechanism to conduct large scale sample analysis
Business Associations	▪ Simulations, contribute to P&R plans ▪ Communication dissemination, activate resources from the business community	▪ Maintenance of long-term business continuityif there is demand from membership ▪ Maintenance of business	▪ Understanding the resources available in and the perspectives of the private sector; set up relationship with the private sector for mobilization before and during an outbreak ▪ Establish a mechanism of communicating to the private sector and deploying messages through companies ▪ Establish mechanism for dissemination of proper and correct prevention messages

Table A2: Potential Roles of the CSO Sector in Preparedness, Prevention and Response

CSO Sector	Role	Incentives to the Sector	Value to the OH
General	▪ Funding, human resources and capacity development, research, education, communication, and dissemination	▪ Ensure the existence of favorable policies, legislative frameworks, and coordinating mechanisms	▪ Research and dissemination on issues pertinent to One Health issues
Professional Associations	▪ Educational campaigns, research, communication and dissemination, capacity development	▪ Ensure the existence of favorable policies, legislative frameworks, and coordinating mechanisms for Societies/Professional Associations in general and member professionals in particular	▪ Education and information dissemination, contribution as resource persons at different level
Local and International NGOs	▪ Educational campaigns, funding, communication and dissemination, capacity development, health service delivery	▪ Ensure the existence of favorable policies, legislative frameworks and coordinating mechanisms for local and international NGOs	▪ Information dissemination to those potentially affected the most ▪ Health service delivery ▪ Increased funding for implementation and service delivery
Bilateral and Multilateral Donor Agencies	▪ Provision of financial and non-financial resources, capacity development supports	▪ Minimize perception of risk to tourists; understand and control the message	▪ Information dissemination
Academia and Think-Tanks (Research Institutions, Universities, Training Centers)	▪ Research, human resources development, communication, and dissemination		▪ Efficient means of ensuring collection/distribution of samples and/or materials

APPENDIX 5: OVERVIEW OF ZOONOTIC DISEASES

GENERAL OVERVIEW OF ZOONOTIC DISEASES

Definition of Zoonotic Diseases

According to the CDC definition, zoonotic diseases are defined as those diseases that can spread between animals and people. They are either endemic—with a limited geographical distribution confined to a country or geographical zone—or pandemic, with a wide distribution and potential of affecting several countries and continents. Zoonotic diseases with pandemic potential are highly contagious and spread easily among susceptible populations, causing high mortality and morbidity rates as well as impacts on livelihoods. Zoonotic diseases vary depending on their etiology and are classified as emerging or re-emerging diseases based on their appearance[38].

Emerging and Reemerging Diseases

An emerging disease is defined as a new infection resulting from the evolution or change of an existing pathogen or parasite, resulting in a change of host range, vector, pathogenicity, or strain; or the occurrence of a previously unrecognized infection or disease. The rapid detection and response to an emerging or re-emerging disease is crucial. From the time this new disease develops until it is detected, a critical period elapses. The rapid detection of such a new epidemiological event is therefore a key element for all policies to be developed. It is often the case that the disease will have spread undetected for a significant period before it is detected and reported. With globalization and the increase in speed and volume of international transport as well as passenger travel, emerging pathogens also begin their global voyage and spread quickly (OIE, 2017).

Some of the examples of emerging or re-emerging zoonosis include Ebola, Monkey pox, Rift Valley fever in Africa and in the Arabian Peninsula; MERS-CoV, Crimea Congo hemorrhagic fever in the Middle East; BSE in Europe and the rest of the world; the highly pathogenic avian influenza H5N1; and the low pathogenic avian influenza H7N9.

Of the 1415 microbial diseases affecting humans, 868 (61 percent) are zoonotic, and 175 pathogenic species are 'emerging'. Of the emerging pathogens, 132 (75 percent) are zoonotic. Of the 175 species of infectious agents associated with emerging disease, 44 percent are viruses or prions, 30 percent are bacteria or rickettsia, 9 percent are fungi, 11 percent are protozoa and 6 percent are helminthes. Ninety-five percent of helminthic species pathogenic to humans are known to be zoonotic, compared with 76 percent of viruses and prions, 65 percent of protozoa, 50 percent bacteria and rickettsia, and just 38 percent of fungi (Louise H. Taylor, 2001).

Remerging zoonotic diseases are those infectious agents that have been known for some time, had fallen to such low level that they were no longer considered a public health problem, and are now showing upward trends in incidence or prevalence worldwide. Since 2005, the WHO has formally declared a total

[38] World Organization for Animal Health, Emerging and Re-emerging Zoonosis (2017)

of four Public Health Emergencies of International Concern, most of which are zoonotic and one re-emerged[39]:

- H1N1 influenza pandemic in 2009
- The re-emergence of wild poliovirus in 2014
- West Africa Ebola epidemic starting in 2014
- Zika epidemic in 2016

Typically, there may be several instances of cross-species events before an organism becomes established in the newly infected host. Wildlife (e.g., bats, nonhuman primates) and food animals (e.g., poultry, swine, and cattle) have been sources of zoonoses for human beings. Some animal microbes only occasionally spill over into the human population under an unusual confluence of circumstances (e.g., Nipah virus from bats); others have become well adapted to the human host (e.g., the retrovirus, human immunodeficiency virus) and now are sustained by human-to-human transmission without the need for reintroduction to the animal reservoir (e.g., primates).

The contribution of endemic zoonotic diseases to public health threats and socioeconomic wellbeing has gained an increased focus because of the changing dynamics of human-animal-environmental interactions. Interface dynamics influenced by climate change, globalization, agricultural intensification, growth in human populations and pressure on land resources, rapid global travel, trade, and the use of microbial substances in animal production and food preservation have resulted in complex health threats that are beyond the control of traditional health services. Consequently, unprecedented morbidity, mortality, and socio-economic impacts have been seen whenever incursion with these pathogens occurred (Louise H. Taylor, 2001).

RISK FACTORS AND DRIVERS

Factors that influence the emergence or reemergence of zoonotic diseases are either related to the host, agents, and the environment or the complex interaction of these factors. Human pathogens emerge and re-emerge due to the interaction of multiple complex factors between the host and agents, each driven by the need to secure the success of the species in changing environments.

A key driver of disease emergence and re-emergence today is the evolution of pathogen strains that are resistant to existing therapeutic agents. Adaptation by one partner to exploit new environments will often stimulate the other to change its characteristics to take advantage of the change. Emerging and/or re-emerging zoonoses in humans are largely driven by environmental and land-use changes,[40]as well as the emergence of antibiotic-resistant bacteria in both humans and animals related to widespread use of antibiotics across species including in animal husbandry[41].Common examples of a pathogens transmitted between animals and humans include some strains of Mycobacterium, *E. coli,* and Salmonella.

[39] WHO, The International Helath Regulations (IHR)-10 Years of Global Public Health Security (2017)
[40] Louise, Sophia & Mark, Risk Factors for Human Disease Emergence (2001)
[41] Landers et al., a Review of Antibiotic Use in Animals (2012)

Deforestation, human settlement sprawl, industrial development, road construction, large water control projects (such as dams, canals, irrigation systems, and reservoirs), and climate change have all been accompanied by global increases in morbidity and mortality from emerging and re-emerging infectious diseases.

According to the study conducted by Mark E.J. Woolhouse and Sonya Gowtage [42], there are 10 main drivers of emerging and reemerging infectious diseases that are ranked by the total number of pathogen species associated with them.

1. Changes in land use or agricultural practices
2. Changes in human demographics and society
3. Poor population health (e.g., HIV, malnutrition)
4. Hospitals and medical procedures
5. Pathogen evolution (e.g.,antimicrobial drug resistance, increased virulence)
6. Contamination of food sources or water supplies
7. International travel
8. Failure of public health programs
9. International trade
10. Climate change

ZOONOTIC DISEASES IN ETHIOPIA

Ethiopia has the second-highest burden of zoonotic diseases in Africa, following Nigeria (Grace *et al*., 2012). Although diseases with pandemic potential are not yet registered in Ethiopia, HPAI, MERS-CoV, Rift Valley Fever, etc. could pose a potential threat both to the public and animals due to the imminent risk factors that expose the country to such diseases. Several animal diseases caused by bacteria, viruses, protozoa, and parasites are reported to exist and are potentially capable of causing human disease. Examples include bovine cysticercosis that is responsible for *Taenia saginata* infection in human beings due to the consumption of raw beef, brucellosis, salmonellosis, *Staphylococus aureus* infection, bovine tuberculosis, toxoplasmosis, rabies, leptospirosis, hydatidosis/echinocososis, anthrax, and cryptosporidiosis.

[42] Mark E.J. Woolhouse and Sonya Gowtage, Host Range and Emerging and Reemerging Pathogens (2005)

PRIORITY ZOONOTIC DISEASES IN ETHIOPIA

The prioritization of zoonotic diseases was completed according to the tool developed by the CDC based on severity in humans, the proportion of human diseases attributed to animal exposure, the impact of animal disease at the household level, the availability of intervention methods, and the existence of inter-sectoral collaboration.The five selected diseases to be tackled through the establishment of 'One Health-focused Zoonotic Disease Unit' in the coming five years are rabies, echinococcosis, anthrax, brucellosis, and leptospirosis[43].

The second tier of disease priorities includes Q fever, salmonellosis, BTB (*M. bovis*), leishmaniasis, cysticercosis/taeniasis, toxoplasmosis, and listeriosis. Following the development of the list of priority zoonotic diseases, the three ministries in collaboration with development partners jointly drafted strategies for the control and elimination of rabies and for the prevention and control of anthrax through a One Health approach.

[43] Emily G. Pieracci et al., Prioritizing Zoonotic Diseases in Ethiopia Using a One Health Approach (2016)

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