TRIPARTITE ONE HEALTH

NATIONAL STRATEGY

2024 – 2028

Republic of Namibia

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TRIPARTITE ONE HEALTH NATIONAL STRATEGY 2024 – 2028

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This Tripartite One Health National Strategy was developed through a consultative process with subject matter experts from the human, environmental, and animal health sectors, researchers, and policy formulators at national level. The development of the national strategy aligns with the priorities outlined in the National Action Plan for Health Security (NAPHS, 2021 - 2025). These priorities were derived from a Joint External Evaluation (JEE) conducted in 2016.

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Specific acknowledgement of individuals and the institutions they represent, and who participated in developing and validating this national strategy on One Health are listed in Annex 1.

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Foreword

Challenges at the human-animal-environment interface (zoonotic diseases, such as rabies, food-borne diseases and antimicrobial resistance) continue to have a major impact on health, livelihoods, and economies. Many countries recognize the benefits of taking a multisectoral and multidisciplinary One Health approach to build national mechanisms for coordination, communication, and collaboration to address these health threats.

An unprecedented global increase in emergent and re-emergent pathogens has significant public health implications. Zoonotic and vector-borne pathogens have a severe impact -causing significant human morbidity and mortality, loss of income due to suspended animal trade and animal death, and reduced biodiversity through loss of wildlife - especially amongst resource-limited communities who rely heavily on their environments for survival. Factors contributing to the increasing burden of these diseases include, but are not limited to, human and animal population expansion, wildlife habitat degradation, international travel and trade, changing farming systems, urbanization, cultural practices, poverty, and climate change.

Health is a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. The successful prevention and control of re-emergent zoonotic and vector-borne diseases requires a One Health approach. This involves a multisectoral collaboration between the human, animal, and environmental health sectors, and among other stakeholders.

Guided by this national strategy, the purpose of implementing One Health in Namibia (2024-2028) is to strengthen collaboration between multiple sectors to attain the highest level of health and wellbeing using the One Health approach. One Health provides the opportunity to recognize shared interests, set common goals and drive towards teamwork to benefit the health of all nations. Specific outputs are expected to be produced, such as the prioritization of zoonotic diseases in Namibia and their inclusion in the Integrated Disease Surveillance and Response (IDSR) system, the National Action Plan for Health Security (NAPHS) 2021 - 2025, and the Africa Centres for Disease Control and Prevention (Africa CDC) One Health Framework for Africa.

The implementation of the One Health National Strategy in Namibia from 2024 to 2028 will contribute to a reduced disease burden, enhancement of universal health coverage, food safety and food security, enhanced conservation of wildlife biodiversity and better rural livelihoods, among other benefits. This national strategy represents the continued commitment of the Government of Namibia (GRN) to strengthening collaboration between our ministries to prevent zoonotic diseases at the human-animal-environment interface.

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Minister of MoHSS

Hon. Pohamba Shifeta
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Preface

Increases in population movement, climate change and habitat overlap between humans and animals provide new opportunities and elevated risks for the emergence and spread of diseases that adversely impact both human and animal health, as well as food security. The One Health approach helps address shared health threats such as zoonotic diseases, antimicrobial resistance (AMR), food safety, food security, vector-borne diseases, and extreme weather or conflict events, which can disrupt and displace populations. Various global initiatives also embrace a One Health approach in order to attain relevant Sustainable Development Goals (SDGs), improve global health security, and comply with the International Health Regulations (IHR).

Approximately 60% of existing and 75% of newly emerging infectious diseases in humans are zoonotic, for example, SARS-CoV-2.13–15. Globally, zoonotic diseases are associated with 2.5 billion cases of human illness and 2.7 million deaths annually, mostly in developing countries.

The One Health Approach cuts across different ministries: Ministry of Health and Social Services (MoHSS), Ministry of Environment, Forestry and Tourism (MEFT) and Ministry of Agriculture, Water and Land Reform (MAWLR). The collaboration between these three ministries is a network required and prescribed by the natural existing ecosystem.

Although Namibia has managed to and contain malaria morbidity and mortality, HIV prevalence, TB incidence, and infant and child mortality rates, zoonotic diseases have not received the necessary attention and concerted effort required to address them. This can only be remedied through an established One Health coordinating body.

The first ever One Health stakeholders workshop was convened in Windhoek in 2023 for the main purpose of developing a National One Health Framework and with the ultimate goal of establishing a One Health coordinating body in Namibia.

This national framework lays the foundation for targeted and coordinated One Health strategies with regard to zoonotic diseases, integrated vector control management including Neglected Tropical Diseases (NTDs), strengthened environmental management in support of zoonosis programmes, development of specific case management/standard operating procedure (SOP) guidelines and capacity building, especially in the area of surveillance and response, preceded by timely data capturing and sharing.

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Acronyms

AFCDC	Africa Centres for Disease Control and Prevention
AHS	African Horse Sickness
AHT	Animal Heath Technicians
AML	African Migratory Locusts
AMR	Antimicrobial Resistance
AMR TWG	Antimicrobial Resistance Technical Working Group
ASF	African Swine Flu
BCC	Behaviour Change Communication
BL	Brown Locusts
BON	Bank of Namibia
BSE	Bovine Spongiform Encephalopathy
BVD	Bovine Viral Diarrhoea
CBD	Convention on Biological Diversity
CBO	Community-Based Organizations
CBT	Commodity-Based Trade
CBPP	Contagious Bovine Pleuropneumonia
CCHF	Crimean-Congo Haemorrhagic Fever
CDC	Centres of Disease Control and Prevention
CITES	Convention on International Trade in Endangered Species
COHESA	Capacitating One Health in Eastern and Southern Africa
COVID-19	Coronavirus Disease
CHW	Community Health Workers
CSF	Classical Swine Fever
CSO	Civil Society Organizations
CVL	Central Veterinary Laboratory
DDRM	Directorate of Direct Risk Management
DRMC	Disaster Risk Management Committee
DVS	Directorate of Veterinary Services
EBS	Event-Based Surveillance
EBS FP	Event-Based Surveillance Focal Point
EWAR	Early Warning and Response
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FLI	Friedrich-Loeffler-Institut
FMD	Foot and Mouth Disease
GAP	Global Action Plan
GDP	Gross Domestic Product
GHSA	Global Health Security Agenda
GLASS	Global Antimicrobial Resistance Surveillance System
HALE	Health Adjusted Life Expectancy
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
HPAI	Highly Pathogenic Avian Influenza
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IHR	International Health Regulations
IPC	Infection, Prevention and Control
IPES	International Panel of Experts on Sustainable Food Systems
IPPC	International Plant Protection Convention
IPM	Integrated Pest Management
JAP	Joint Action Plan
JEE	Joint External Evaluation
KAZA TFCA	Kavango Zambezi Transfrontier Conservation Area
LSD	Lumpy Skin Disease
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MFMR	Ministry of Fisheries and Marine Resources
NAAP	National Antimicrobial Resistance Action Plan
MoHSS	Ministry of Health and Social Services
NamFELTP	Namibia Field Epidemiology and Laboratory Training
NamLITS	Namibia Livestock Identification System
NAMPHI	Namibia Public Health Institute
NAPHS	National Action Plan for Health Security
NCD	Noncommunicable Diseases
ND	Newcastle Disease
NDP	National Development Plan
NFP	National Focal Point
NGO	Non-Governmental Organization
NHEMC	National Health Emergency Management Committee
NIP	Namibia Institute of Pathology
NSA	Namibia Statistics Agency
NTDs	Neglected Tropical Diseases
NTFP	Non-Timber Forest Products
NUST	Namibia University of Science and Technology
OH	One Health
OHMCC	One Health Multisectoral Coordination Committee
OH HLEP	One Health High Level Expert Panel

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OH JPA	One Health Joint Plan of Action
OPM	Office of the Prime Minister
PEP	Post-Exposure Prophylaxis
PH	Public Health
PHC	Primary Health Care
PHEOC	Public Health Emergency Operations Centre
PPR	Peste de Petits Ruminants
PVS	Performance of Veterinary Services
RKI	Robert Koch Institute
RL	Red Locust
RVF	Rift Valley Fever
SOP	Standard Operating Procedure
SPS	Sanitary and Phytosanitary
STAR	Strengthening Technical Assitance and Response
SWOT	Strengths, Weaknesses, Opportunities and Threats
THIRA	Threat and Hazard Identification and Risk Assessment
TB	Tuberculosis
UN	United Nations
UNAM	University of Namibia
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNSIC	United Nations System Influenza Coordination
VCF	Veterinary Cordon Fence
VRAM	Vulnerability Risk Assessment Mapping
WHO	World Health Organization
WHO AFRO	WHO African Region
WOAH	World Organization for Animal Health
WTO	World Trade Organization

Executive Summary

Namibia has implemented various multisectoral responses in order to address several disease outbreaks and public health threats in the recent past, albeit on a needs-based approach. In addition, Namibia continuously experiences several climate change and environmental safety emergencies from time to time. Extreme climatic events and natural disasters such as floods and droughts, and their consequences on human health, causing suffering and loss of life and property, are common in Namibia.

The success of these past responses has demonstrated the need for a formalized One Health Platform - a strategic, forward-looking approach to integrated, multisectoral preparedness and response. The One Health National Strategy will serve as the roadmap to make this approach a reality.

The purpose of this One Health National Strategy is to provide focused guidance through a set of objectives and proposed activities, for the Ministry of Health and Social Services (MoHSS), Ministry of Environment, Forestry and Tourism (MEFT), Ministry of Agriculture, Water and Land Reform (MAWLR) and other stakeholders to adopt when addressing One Health challenges in the country. It further highlights how the One Health approach strengthens collaboration between relevant sectors within the country to prevent, detect, and address these shared health threats. This document aligns with Vision 2030, the Fifth National Development Plan (NDP5), and the National Action Plan for Health Security (NAPHS 2021-2025). By adopting the recommendations of this document, the expected outcomes are aligned with the desired impact of the One Health objective as stipulated by the One Health Joint Plan of Action (2022–2026) (OH JPA) developed by the Quadripartite Organizations – the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Organisation for Animal Health (WOAH), and the World Health Organization (WHO).

The desired impact is a world better able to prevent, predict, detect, and respond to health threats and improve the health of humans, animals, plants, and the environment, while contributing to sustainable development.

The present strategy will therefore:

- Support and promote collaboration with key stakeholders accross all relevant sectors to strengthen the implementation of One Health activities through coordination, collaboration, and communication;
- Develop and strengthen surveillance systems and data-sharing mechanisms with all relevant stakeholders;
- Strengthen laboratory systems and networks to ensure active surveillance for early detection and response to priority zoonotic diseases using a One Health approach;
- Ensure effective and coordinated public health emergency preparedness and response using a One Health approach;
- Strengthen and support workforce development using a One Health approach to prevent and control priority zoonotic diseases.
- Build capacity in disease surveillance and diagnostic techniques through One Health approach accross the sectors; and
- Provide technical expertise in the implementation of strategies for control and prevention of diseases of public health concerns and guidance on sustainable coordination mechanisms in the implementation of One Health activities.

This framework should be used in conjunction with other resources referenced herein. It is a practical guide for the Namibia Public Health Institute (NAMPHI), MoHSS, MEFT, MAWLR, and other stakeholders but not an authoritative reference for individual diseases or public health approaches. Where Ministries have already developed capacity for activities proposed in this framework, they are recommended to focus on the additional activities which have not yet implemented.

It is important to note that the specific content and structure of a One Health National Strategy can vary depending on the country's unique circumstances, health challenges, and available resources. The plan should be a living document that can be adapted and updated as needed, to address evolving health threats and changing priorities. Successful implementation of such a plan requires strong commitment, coordination, and collaboration among all stakeholders involved in human, animal, and environmental health.

1. Introduction

It is well documented that no single sector or department can sufficiently manage the challenges of public health in any one country, region, or continent, hence multisectoral coordination plays a crucial role in effectively managing public health threats using One Health.[1, 2] The significance of using the One Health (OH) approach in combating public health (PH) events has also been evidently demonstrated through experiences from the fight against COVID-19, Ebola, and the highly pathogenic avian influenza in the past five years. In response to this challenge, the One Health approach has been advocated as the global framework for strengthening collaboration and capacities of the sectors and actors involved in health service delivery.[3]

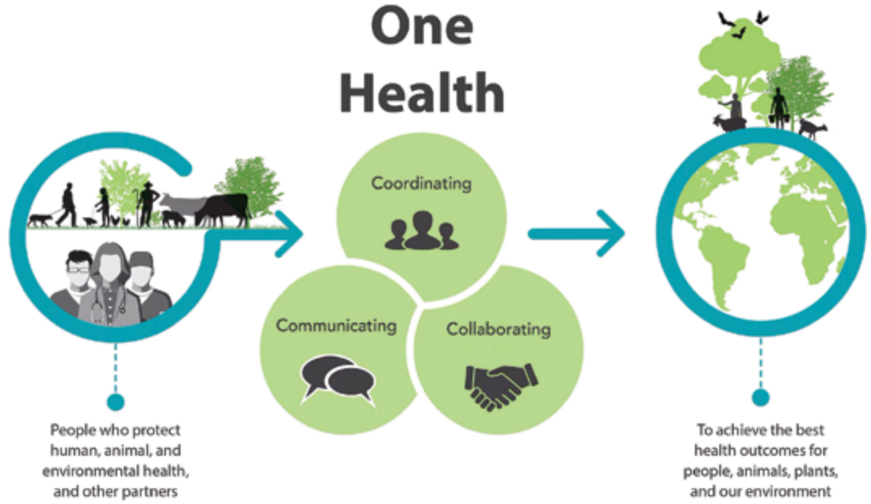

Figure 1: The One Health concept

According to the 2022 Report of the Quadripartite Organizations (WHO, UNEP, FAO and WHOAH), One Health is an "integrated, unifying approach that aims to sustainably balance and optimize the health of humans, animals, plants, and ecosystems. It recognizes that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent". The One Health Quadripartite further expanded the definitions as follows: "The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster wellbeing and tackle threats to health and ecosystems while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development."

Whilst health, food, water, energy and environment are all wider topics with sector-specific concerns, and in recognition of the cross-cutting nature of these issues, the collaboration across sectors and disciplines contributes to protecting health, addressing health challenges such as the emergence of infectious diseases, antimicrobial resistance, and food safety and promotes the health and integrity of ecosystems.

By linking humans, animals, and the environment, OH can help address the full spectrum of disease control – from prevention to detection, preparedness, response and management - and contribute to global health security. The OH approach can be applied at community, subnational, national, regional and global levels and relies on effective governance, communication, collaboration and coordination. Having the OH approach in place makes it easier for people to better understand the co-benefits, risks, trade-offs and opportunities to advance equitable and holistic solutions.

Within the Namibian context, the need for an OH approach is evidenced by reports of zoonotic disease, coupled with landscape changes. The country is also experiencing the impacts of climate change and environmental land use changes. This includes bush encroachment, sporadic flooding and frequent droughts, all of which impact arthropod distributions, human wellbeing, ecosystem integrity and resilience, and consequently vector-borne pathogens. With the abundance of wildlife and livestock in the country, there is an increase in human-wildlife conflict in shared environments. Moreover, many zoonotic pathogens have been reported including Schistosomiasis, Crimean-Congo Haemorrhagic Fever (CCHF), anthrax, Foot and Mouth Disease (FMD), brucellosis and other tick-borne pathogens.

The challenges mentioned above do not only require disease management, but also the management of land-use, dealing with local socio-economic activities and livelihoods, and sustainable natural resource management (including livestock production – livestock health, rangeland management and wildlife economy). There is thus a clear need to establish a mechanism that advances and ensures a OH approach towards surveillance, prevention and control of pathogens, in order to create a sustainable and healthy ecosystem.

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I. Rationale for One Health National Framework in Namibia

The integration of One Health principles and practices in Namibia is of utmost importance for several compelling reasons. One Health is a collaborative approach that recognizes the interconnections between human health, animal health, and the environment, emphasizing the need for interdisciplinary cooperation to address complex health challenges.

Integrating One Health in Namibia is crucial for the following reasons:

1. **Disease Prevention and Early Detection:** Many infectious diseases, including zoonotic diseases, originate in animals and can spill over to humans. Disease surveillance systems and early detection mechanisms in Namibia can be enhanced by adopting a One Health approach, enabling prompt responses to potential disease outbreaks. This integrated approach ensures a holistic understanding of disease dynamics, facilitating the implementation of preventive measures at the human-animal-environment interface.

2. **Zoonotic Disease Control:** Namibia, like many other countries, faces the threat of zoonotic diseases, which can have devastating consequences for human and animal populations, and the environment. Integrating One Health strategies allows for the identification, prevention, and control of zoonotic diseases at their source, reducing the risk of transmission and improving overall public health. Collaboration between the human health, veterinary, and environmental sectors enables effective disease monitoring, prevention, and control efforts.

3. **Environmental Conservation: Namibia is known for its diverse ecosystems and wildlife.** Integrating One Health principles emphasizes the intrinsic link between human health and the environment. By promoting sustainable land and wildlife management practices, Namibia can minimize the risk of disease transmission from wildlife to humans, preserve biodiversity, and maintain ecosystem health. This approach contributes to the overall wellbeing of both the population and the environment.

4. **Food Safety and Security:** Namibia relies heavily on agriculture for food security. Implementing One Health practices ensures the safety of the food supply chain by addressing issues related to transboundary plant pests and diseases, foodborne diseases, antimicrobial resistance, and environmental contamination. By integrating veterinary, agricultural, and public health perspectives, Namibia can enhance food safety measures, protect consumer health, and promote sustainable agricultural practices.

5. **Resilience to Climate Change:** Namibia is susceptible to the impacts of climate change, including shifts in disease patterns and the increased risk of emerging infectious diseases. The One Health approach acknowledges the interconnectedness of climate, ecosystems, and human and animal health. By integrating climate change adaptation strategies into public health planning, Namibia can build resilience, anticipate and mitigate the health risks associated with climate change, and ensure the wellbeing and mental health of its population.

II. Situational Analysis

The Republic of Namibia is situated on the southwestern Atlantic coast of the African continent, sharing borders with Angola, Botswana, South Africa, Zambia, and Zimbabwe (Figure 2). Two major deserts are found in the country - the Namib desert situated to the West, and the Kalahari Desert in the East. Namibia is approximately 825,419 km2, with a population estimate of 3,022,401 people. Most of the population (50.5%) live in rural

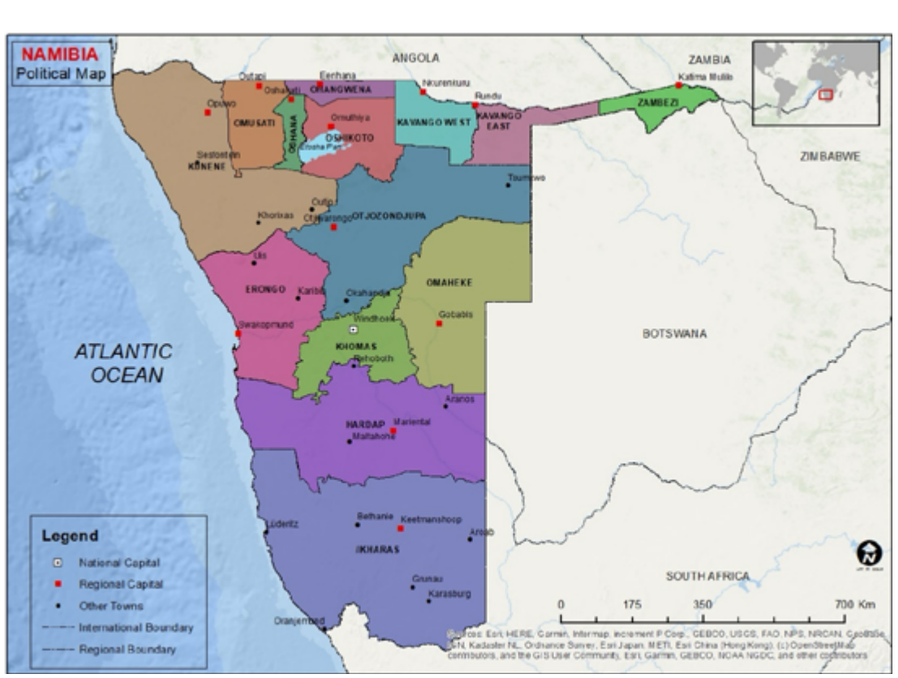


Figure 2: Map of Namibia

areas (1,557,407 people in 2023)[4]. The National Population and Housing Census 2023 further indicated that the female population accounts for 51% of the total population. The life expectancy at birth for both sexes combined is 59.5 years (females 63.1 years and males 56.0 years.[5]

Namibia is one of the most sparsely populated countries in the world, with a density of 3.7 inhabitants per km^2. The spatial distribution of the population, as indicated by the National Planning Commission (NPC, 2020), reflects that half of the inhabitants live in rural areas where they mainly engage in livestock production and subsistence farming. The country has 14 regions with 121 regional constituencies with the national capital, Windhoek, located in the Khomas region. Politically and administratively, Namibia is a sovereign, secular, democratic, and unitary State divided into the usual three organs, namely: Executive, Legislative, and Judiciary. The head of state is the President, elected in a national election every five years.

The Namibian health care system is organized in a three (3)-tier structure with operations at central, regional, and district levels. The central level has devolved authority to 14 MoHSS regional directorates and 36 districts. Service delivery is premised on the primary health care (PHC) approach.

a. Economic Profile

Over the past two years Namibia's economy has been weakened and growth has slowed, primarily due to: i) the downturn of the anticipated global economic recovery and growth; and ii) severe drought has exacerbated food and livelihood insecurity for many communities across the country and as a result a national drought disaster was declared in 2019. In terms of public health, the government has been battling to improve access and quality services to address the disease burden of NCDs and infectious diseases such as Tuberculosis (TB), Malaria, HIV/AIDS, viral Hepatitis, and other water-borne diseases. Furthermore, the COVID-19 pandemic demonstrated the country's vulnerability to respiratory influenza pathogens which have disproportionately affected the population at risk. In addition, COVID-19 has negatively impacted the national economy and people's livelihoods.

Namibia's Gross Domestic Product (GDP) growth is projected to slow down further in 2023, mainly due to a weaker demand in both global and domestic economies. Real GDP growth is projected to moderate downwards to 3.3% in 2023, from 4.6 % registered in 2022.[6] Namibia's nominal GDP is N$ 59.7 billion as of 2023. The GDP growth rate in 2023 was 7.2%, representing a change of N$ 6.8 billion over 2022 when real GDP was 52.9 billion. The key drivers to GDP are mining and quarrying (51.7%), agriculture and forestry (19.9%) and transport services (8.8%).

With a Gini Coefficient of 0.597, Namibia has the most unequal income distribution in the world.[7] Besides the weak demand, high base effects from the diamond sector, which expanded by more than 45.0% in 2022, dampened the impact on 2023 growth. Risks to domestic growth are predominantly in the form of ongoing monetary policy tightening globally and the costs of key import items that are likely to remain high for the entire forecast period.

Major central banks in the world continue to tighten monetary policies and this is anticipated to result in a further global slowdown in 2023 and 2024. Furthermore, the war between Russia and Ukraine is likely to continue for longer, impacting high prices for affected commodities for which Namibia is a net importer, including fuel, wheat and cooking oil. Other domestic risks include water supply interruptions that continue to affect mining production at the coast, potential spillover of electricity cuts in South Africa to Namibia, and an expected El Niño weather event, which is likely to hurt crop production in southern Africa as a whole.[6]

b. Human Health Profile

Namibia has recorded several documented human disease outbreaks since 2006. In 2006, the country reported a polio outbreak, which resulted in 19 confirmed polio cases. During 2009-2014, the country reported a measles outbreak in most regions, which affected children, predominantly in the northwestern and central regions of Namibia. These outbreaks resulted from low immunization coverage. An outbreak of pandemic influenza H1N1 was also reported in 2009, with 72 confirmed cases and 1 death. A post-pandemic period reported 9 069 H1N1 suspected cases in 2010, of which 102 were confirmed with subsequent H1N1 outbreaks, and 3 155 cases were reported in Ohangwena in 2011.

A cholera outbreak was reported in Kunene region between December 2013 and January 2014, in which 287 cases and 10 deaths were recorded. Although the malaria mortality rate in Namibia declined drastically from 96.5 per 100 000 population in 2 000 to 8.4 per 100 000 population in 2008 (WHO Namibia, 2010), outbreaks have been on the increase since 2017. The country reported 7003 malaria cases between January and February 2017 and an increase in malaria cases ranging between 120 and 700% in Ohangwena, Oshikoto, Oshana and Otjozondjupa regions between 2014 and 2017. Crimean-Congo Haemorrhagic Fever (CCHF) outbreaks have been documented in Namibia since 1986. In 2019, two CCHF outbreaks were reported - one in Onandjokwe district, Oshikoto region and the other in Omusati region. No deaths were registered. In addition, a Hepatitis E Virus outbreak was reported in September 2017 and was declared over in 2022.[8]

Namibia recorded its first two COVID-19 cases on 13th March 2020. By 29 November 2020, a total of 14 345 confirmed cases and 151 deaths were recorded. All 14 regions reported COVID-19 confirmed cases - Khomas and Erongo regions recorded the highest number, with 6 435 (44.9%) and 4 049 (28.2%), respectively.

The MoHSS has adopted the Integrated Disease Surveillance and Response (IDSR) approach, and the International Health Regulation National Focal Point to facilitate the implementation of the International Health Regulations (IHR, 2005). The MoHSS also has a National Health Emergency Preparedness and Response Plan (NHEPRP) that was approved in 2013. This plan aims to coordinate the preparedness and response activities to disease outbreaks and emergencies in the country.

The Directorate of Disaster Risk Management (DDRM), under the Office of the Prime Minister (OPM) supports the MoHSS during emergencies, in collaboration with development partners including the United Nations (UN) and Civil Society Organizations (CSOs), as per the Disaster Risk Management (DRM) Policy.

International targets include ensuring healthy lives and promoting wellbeing for all ages, which is essential to sustainable development.

Significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. Major progress has been made in increasing access to clean water and sanitation, reducing malaria, tuberculosis, vaccine-preventable diseases such as polio, and the spread of HIV/AIDS. High HIV/AIDS and TB prevalence rates pose hindrances to the sustained control of communicable diseases and public health events that originate from human, animal, and environmental interactions such as rabies, anthrax, CCHF, schistosomiasis, malaria, intestinal infestations, etc. MoHSS has therefore embraced and recognized the One Health Approach as the catalyst for effective prevention and control of public health threats and for health system strengthening.

c. Animal Health Profile

Description of the livestock sector

Agriculture is a key economic sector in Namibia, contributing around 5.1% to GDP, of which 70% of this contribution is from the livestock sector. According to the Namibia Statistics Agency (NSA) data, livestock farming contributed nearly N$6.3 billion to the nominal GDP, an increase of nearly N$1.1 billion year on year. Livestock farmers in

the country are required to register with the Namibia Livestock Identification System (NamLITS), which is run by the Directorate of Veterinary Services for the identification and traceability of livestock in the country. Currently, 96 748 farmers are registered on the system, of whom 75 000 practice communal farming, and the remaining 21 748 are commercial farmers. The total number of livestock is estimated at 2.5 million cattle, 2.5 million sheep, 1.8 million goats, and 17 000 pigs. Communal farmers contribute 1 596 218 livestock, with the remaining numbers owned by commercial farmers.

Livestock GDP and revenues in commercial value chains are largely dependent on exports of meat and live animals. The country's livestock sector is divided into three (3) main zones, based on the endemicity of foot and mouth disease (FMD), demarcated by a veterinary cordon fence (VCF). These regions are: (i) the WOAH-recognized free zone, (ii) the protection zone and (iii) the infected zone. The FMD Infected zone comprises the entire Zambezi Region and includes Mukwe and Ndiyona constituencies in the Kavango East Region.

The FMD Protection zone in Namibia is boundaried by the infected zone as well as high-risk areas bordering Botswana in the East, shares an open border with high-risk areas in Angola in the North and borders the FMD free zone in the South. The FMD Protection and Free zones are separated by the Veterinary Cordon Fence (VCF), a game and stock-proof double-fenced corridor. The FMD Free zone is situated in the areas south of the VCF and borders the free zones of Botswana in the East and South Africa in the South and South-East. Newly developed commodity-based trade (CBT) approaches have proved scientifically sound and effective and are accepted by the World Organisation for Animal Health (WOAH). Namibia implemented commodity-based trade (CBT) to facilitate trade of beef and beef products from cattle in the FMD protection and infected zones south of the veterinary cordon fence and other export countries.

Zoning is a recognized approach to control endemic diseases and as explained in the WOAH Standards, allows a country to concentrate its resources in a defined restricted area where controlling and eradicating the disease would be achievable. This approach has since been expanded to include the official recognition of animal health risk status for African Horse Sickness (AHS), classical swine fever (CSF), contagious bovine pleuropneumonia (CBPP), peste des petits ruminants (PPR) and bovine spongiform encephalopathy (BSE) as well as the endorsement of official control programmes for CBPP, FMD, PPR and dog-mediated rabies. Namibia is recognized free from FMD, CBPP, PPR in the FMD free zone and BSE in the country.

The livestock sector is supported by the Directorate of Veterinary Services (DVS), which falls under the Ministry of Agriculture, Water and Land Reform. Currently, the DVS comprises 315 veterinarians, of which 89 are employed by the state. State veterinary services are assisted by animal health technicians and veterinary hygiene inspectors at the abattoirs.

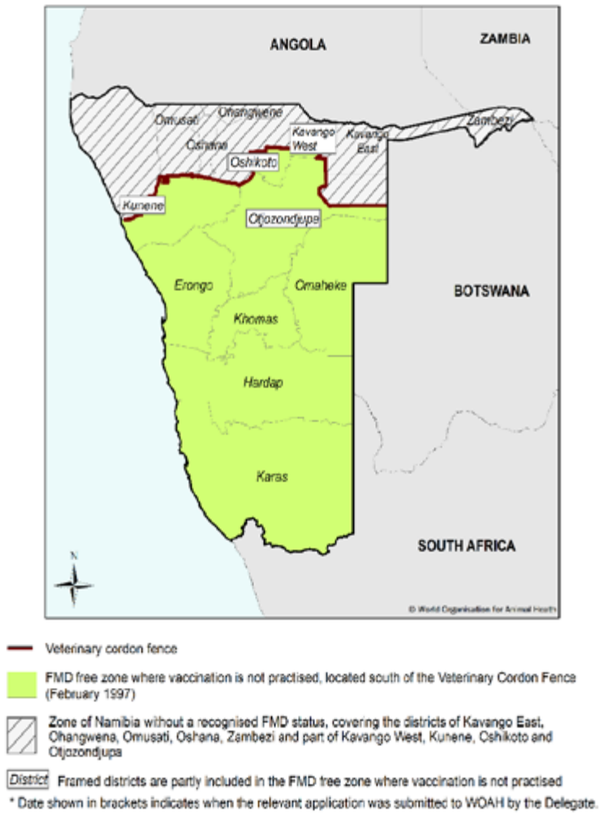


Figure 3: Namibia Foot and Mouth Disease Zone Map

Currently, the state veterinary services is divided into 27 key veterinary districts, and 69 animal health technician offices. The DVS is the competent authority responsible for animal disease control, diagnostic services and research, veterinary public health, epidemiology, import/export control, traceability, medicine control and advisory services.

Animal diseases reported in the country

Some of the main diseases that have been reported in the country include Foot and Mouth Disease (FMD), Contagious Bovine Pleuropneumonia (CBPP), Anthrax, Rabies, Rift Valley Fever (RVF), Lumpy Skin Disease (LSD), Newcastle Disease (ND), Highly Pathogenic Avian Influenza (HPAI), Brucellosis, Bluetongue, African Swine Fever (ASF), Anaplasmosis, CCHF, Brucellosis, Chlamydiosis, Sheep Scab, Bovine Viral Diarrhoea (BVD), Fasciolosis, Taeniosis, and Toxoplasmosis. Of the reported diseases, the following have One Health significance, either due to being zoonotic and/or due to significant economic impact which affects the livelihoods of farmers and the national GDP: FMD, CBPP, Rabies, Anthrax, Taeniosis and LSD.

Livestock - Wildlife - Animal Interface

Namibia's diverse landscapes and rich biodiversity create a unique interface between livestock, wildlife, and animals, presenting both challenges and opportunities for sustainable coexistence and management. Engaging and empowering local communities in the management of identified livestock-wildlife issues therefore remains key.

One of the key challenges is the close proximity of livestock, wildlife, and animals that can lead to the transmission of diseases, such as brucellosis, tuberculosis, and FMD between different species. This poses a significant challenge to the health and productivity of both domestic livestock and wildlife populations. In addition, livestock and wildlife often compete for grazing land and water resources, particularly during periods of drought. This competition can lead to overgrazing, habitat degradation, and conflicts between pastoralists and conservation authorities.

Livestock agriculture and wildlife conservation are both critical components of Namibia's economy, particularly in the country's component of the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) comprising the Kavango East and Zambezi regions, and a portion of Kavango West. However, the potential economic benefits from livestock production cannot be fully realised because cattle farmers in these areas lack full access to higher-value markets due to the proximity of wildlife, particularly buffalo, that maintain foot and mouth disease (FMD) viruses. This situation has restricted market access and constrained livestock owners who share the land with wildlife.

The interface between livestock, wildlife, and animals also has the potential to result in human-wildlife conflict, particularly in areas where predators pose a threat to livestock and human communities. This conflict can lead to retaliatory killings of wildlife and undermine conservation efforts.

Opportunities exist however in the development and implementation of sustainable land use practices that promote coexistence and minimise resource competition. This includes rotational grazing systems, community-based natural resource management, and wildlife-friendly farming practices. Additionally, the interface between livestock and wildlife offers opportunities for economic diversification through wildlife-based tourism, conservancies, and sustainable utilisation of natural resources. This can provide alternative livelihoods for communities and contribute to the conservation of wildlife and habitats. Implementing integrated management approaches that consider the needs of both livestock and wildlife is essential. This includes coordinated disease surveillance and control, land-use planning that accounts for both livestock and wildlife needs, and the development of collaborative management strategies involving local communities, conservation organizations, and government agencies.

Animal Health related diagnostic laboratory capacity and services

The Central Veterinary Laboratory (CVL) is a Division in the Directorate of Veterinary Services (DVS) which is capable of testing animal diseases, food safety and chemical residues in meat and animal feed. CVL is an ISO/IEC 17025 accredited testing facility by Southern African Development Community Accreditation Services (SADCAS) with 15 accredited test methods and 16 technical signatories. The Central Veterinary Lab is a World Organization for Animal Health (WOAH) reference laboratory for Salmonellosis.

d. Country Environmental Profile (Ecosystem)

The overriding environmental issues in the sensitive dry environment of Namibia are high vulnerability to climate change, water scarcity and vegetation/land degradation resulting from land pressure, especially in the densely populated northern regions. The key issues are vegetation degradation (desertification, bush encroachment, and deforestation), soil erosion and decreasing soil fertility. Extreme climatic variations with periodic drought affect not only livestock and agricultural production, but nearly all sectors of the economy. Namibia is, referring to different climate modelling, one of the countries most severely affected by global climate change, which is locally accelerated by unsustainable land use practices and resulting anthropogenic climate change (aridifying).

Major problems currently include inappropriate land management practices, especially on rangeland and agricultural land. Livestock farming is the principal activity in rural areas, and overgrazing leads to vegetation destruction or bush encroachment and accelerates soil erosion. Soil fertility is decreasing due to inadequate agricultural techniques and salinisation problems in several irrigation schemes. Bush encroachment impacts 26 million hectares of woodland savanna, including 11 million hectares in the communal areas, and leads to loss of carrying capacity and reduction of the available and exploitable groundwater.

The scarcity of fresh water is a significant threat to development. Water supply is only assured due to high investments in water supply systems. Decreasing groundwater levels in some areas, hydrological changes in river systems, and huge water loss in the supply system (dams, canals) due to evaporation are unavoidable side effects of improved water supply. Improved water supply through boreholes, especially in the northern regions, has led to increasing numbers of livestock and in several other areas there is additional pressure on the vegetation due to overgrazing.

The few forest resources (<10% of the country) are under pressure due to exploitation for construction materials and energy supply, especially in remote rural areas. Only 15% to 20% of rural areas are electrified and wood is the dominant energy source for poor rural households. The remaining energy demand is assured mainly by electricity and petrol product imports from neighbouring countries, especially South Africa. Attention on non-timber forest products (NTFP) as sources of alternative or complementary income is increasing, and the risk of over-exploitation of these resources is a consequence.

Namibia has remarkable biological diversity and a high level of endemism - higher plants (687), avian species (13), reptiles (70) and insects (8 500). Furthermore, 217 species of mammals are found in the country, 26 of which are endemic, including the Mountain Zebra, rodents, small carnivores, and unique desert-dwelling rhinos and elephants. Namibia also hosts the world's largest population of cheetahs.

Tripartite One Health
National Strategy

e. Plant Health Profile

Plant health is an overarching term for emerging risks including pests, diseases and weeds, integrated pest management, and innovation in plant protection. It has the potential to contribute to the wider goal of ensuring the sustainability of primary production on an economic, ecological, and social level. In Namibia, plant health plays a crucial role in the realization of the country's aspirations of economic advancement as stipulated in the Harambee Prosperity Plan II (HPP 11). Towards meeting this pillar, the MAWLR Division of Plant Health ensures the following: i) prevents the introduction and spread of plant pests and diseases, ii) promotes appropriate measures to control pests, and iii) monitors environmental contaminants.

Efforts to intensify sustainable crop production in the country have been largely elusive due to several factors that limit the implementation of more efficient practices, particularly at smallholder farm level. Among several factors that are responsible for low productivity are losses due to pest damage and inappropriate use of pesticides. Unfortunately, agricultural practices with limited diversification of crops contribute to the continued occurrence of plant pests. The overuse of pesticides coupled with climate change leads to a higher rate of species and biodiversity losses.

In addition, national and international trade involving the movement of plants and plant products increases the spread of pests and diseases. The unintended introduction of pests and disease outbreaks cost Namibia's government, farmers, and consumers a lot of money every year.

The invasion of new plant pests in territories where they have never been encountered is a worrying phenomenon which negatively affects the local ecosystem, agriculture production and food and nutrition security. Namibia is currently experiencing an infestation of African Migratory Locusts (AML), Red Locusts (RL) and Brown Locusts (BL) which is an enormous threat to already fragile food and nutrition security. These locusts are transboundary pests capable of flying long distances to affect crops and pastures in Namibia.

Effective surveillance is particularly critical as it is essential for reporting the occurrence, outbreak, spread, and control of such pests. This surveillance will provide the necessary information to make informed choices for Integrated Pest Management (IPM) interventions, such as the use of synthetic pesticides. The critical success factors of surveillance operations for effective IPM are preparedness, early detection and rapid response. However, the use of synthetic pesticides has large consequences on the environment (air, water, fauna and flora). As a consequence of introducing synthetic pesticides, many farmers abandoned longstanding well established cultural and physical pest management practices such as fallow cultivation. The coordinated use of multiple tactics for optimising the control of all cases of pests is therefore an ecologically and economically sound decision.

f. Historical Context (Evolution of One Health in Namibia)

Despite One Health being looked at as a new concept in the country, substantial work has been done by individual sectors with minimal coordination across other sectors. In recent years there has been a significant development of One Health in Namibia and the evolving process is marked by collaborative efforts across multiple sectors to address the interconnected health of humans, animals, and the environment.

In 2015, Namibia's national rabies control and elimination strategy was drafted using a One Health approach, with the participation of relevant sectors. As a signatory to the International Health Regulations 2005 (IHR), Namibia has established the National Focal Point (NFP), consisting of members from One Health Ministries (MAWLR, MoHSS, and MEFT) - a multisectoral team that coordinates the implementation of the IHR. The NFP is further responsible for communicating and reporting on events of public health concern emanating from all sectors

In 2016, the country invited international partners through WHO, to conduct the Joint External Evaluation (JEE), which is one of the IHR monitoring and evaluation frameworks. The country started the process of developing the National Action Plan for Health Security (NAPHS) in 2017 to address the recommendations of the JEE, further enhancing collaboration using the One Health approach. Parallel to the development of the NAPHS, other critical areas recommended in the JEE were also spearheaded. These include the consultative development of the national antimicrobial resistance (AMR) action plan with One Health stakeholders. Both NAPHS and national AMR action plan were finalised and duly signed by the three ministries, (MAWLR, MoHSS and MEFT), symbolising the One Health collaborative efforts.

Namibia has made great strides in implementing One Health strategies, including the surveillance and control of zoonotic diseases, the promotion of sustainable livestock and wildlife management, and the conservation of biodiversity. Over several years the country has responded in a collaborative manner to a number of disease outbreaks affecting human and animal populations. This collaboration was notably observed during the response to disease outbreaks that required the involvement of One Health sectors: anthrax, rabies, CCHF, and Avian Influenza among wild migratory birds along the coastal line of Walvis Bay and Swakopmund in the Erongo region, and locust infestation, amongst others. The response to the 2017 anthrax outbreak in Bwabwata National Park, was followed by further training on Infection Prevention and Control (IPC) measures and sample collection by the three ministries.

In addition to biological events, natural disasters, especially floods and drought due to climate change, have been addressed in a concerted manner under the leadership of the disaster risk management structures. This attests to the commitment to adopting a One Health approach to address zoonotic diseases, environmental health challenges, and

the sustainable management of natural resources. One Health initiatives are not limited to the three ministries but also involve a number of stakeholders such as academic institutions, NGOs, and different Offices/Ministries and Agencies (OMAs). As Namibia continues to advance its One Health approach, it is poised to further strengthen its capacity for disease prevention, environmental sustainability, and the overall wellbeing of its population and ecosystems.

One Health efforts in different sectors have been gaining momentum but need further coordination and enhancement. Recent restructuring at UNAM, saw veterinary medicine being moved to health sciences under one faculty – the Faculty of Health Science and Veterinary Medicine. This positive move fosters the One Health collaboration by both faculties and students. In addition, direct strategic directions, community engagement, environmental sustainability, and social relevance concerning One Health have been promoted within the university.

The participation of UNAM in the Capacitating One Health in Eastern and Southern Africa (COHESA) project which started in 2023, hastened the agenda of One Health in the country, bringing all stakeholders together and contributing to the spearheading of One Health promotion in the country.

Lastly, the human-wildlife policy in the MEFT, aims to integrate the three aspects of One Health, including sustainable production consumption, and sustainable use of natural resources, for a balanced ecosystem, whereby animals, humans, and the environment coexist.

g. Antimicrobial Resistance in Africa and Namibia

Africa is generally characterized by a high burden of infections, limited access to healthcare leading to inadequate diagnosis and prescription practices, challenges in implementing robust surveillance systems, poor sanitation and hygiene conditions contributing to the spread of infections, the use of antimicrobials in agriculture with regulatory gaps, limited access to quality medicines, cross-border challenges facilitating the spread of resistant strains, and variable awareness and education about responsible antimicrobial use. Efforts to address and curb antimicrobial resistance (AMR) involve the combination of surveillance, regulatory measures, education, and international collaboration.

In 2015 WHO launched the Global Action Plan in response to the increasing threat posed by AMR to human health, animal health, and agriculture. Recognizing the gravity of this issue, nations worldwide were encouraged to create their own National Antimicrobial Action Plans (NAAPs). Namibia formulated its NAAP in 2017 in collaboration with its key ministries (MoHSS, MAWLR, and MEFT) and alongside

other stakeholders following a comprehensive situation analysis. The plan was officially launched in 2020.

The implementation of activities under the NAAP unfortunately suffered from a lack of synchronized efforts. Each of the three Ministries executed their activities in isolation from each other. This lack of coordination impeded the seamless integration of initiatives and collaboration among these crucial entities, potentially undermining the overall effectiveness of the NAAP.

Namibia has faced a significant challenge in the realm of antimicrobial resistance (AMR) due to the absence of a comprehensive surveillance system. This deficiency resulted in no data being submitted to the Global Antimicrobial Resistance Surveillance System (GLASS) despite the country being registered under its auspices. Recognizing the critical need to rectify this situation, Namibia sought support from WHO which subsequently facilitated training sessions for laboratory technologists on the GLASS reporting platforms. This proactive initiative proved instrumental, enabling Namibia to overcome past hurdles and successfully submit its inaugural GLASS report during the 2022 call.

This marks a pivotal step forward in bolstering the country's contribution to global efforts in addressing AMR. The animal health sector annually reports antimicrobial use data, based on imports and sales by distributors, to the World Organisation of Animal Health (WOAH). Antimicrobial consumption is however not yet reported to farm level and this is partially attributed to the accessibility of over-the-counter antimicrobials.

III. Event-based Surveillance

Event-based surveillance (EBS) uses an all-hazards approach that includes the principles of One Health. It is a crucial component of an effective early warning system, which enables countries to be better prepared for endemic and pandemic illness outbreaks. [9]Event-based surveillance (EBS) entails the organized collection, monitoring, assessment, and interpretation of primarily unstructured ad-hoc information regarding health-related events or risks that may represent an acute risk to human, animal, plant, or environmental health. The process of EBS complements existing indicator-based surveillance as part of epidemic intelligence to improve a country's early warning and response (EWAR) capacity through five main steps: detection, triage, verification, risk assessment, and alert for action and response.

Figure 4: Steps of EBS (Adopted from Namibia EBS guideline

Namibia's event-based surveillance guideline, which is based on the Africa CDC framework[10] offers guidance to the human health, environmental, and agricultural sectors for the prompt detection and response of public health events/threats in conjunction with the Public Health Emergency Operating Centre (PHEOC) guidelines. Event-based surveillance provides a mechanism for early detection and response to potential health threats that may emerge at the human-animal-environment interface, including identifying and investigating outbreaks, zoonotic diseases, and other health-related incidents that may affect human, animal, and environmental health. Therefore, event-based surveillance and the One Health approach are interconnected in their efforts to promote an all-inclusive and collective approach to monitoring and addressing public health threats that transcend traditional boundaries between human, animal, and environmental health.

The information flow for EBS reporting and feedback should align with and leverage existing surveillance reporting structures. Figure 3 illustrates how information can flow within and across sectors. Most commonly, signals detected at the community level by community health workers (CHWs), animal health technicians (AHT), key informants, or other community members are reported immediately to a community-level supervisor or local Event-Based Surveillance Focal Point (EBS FP). Signals or events detected at facility level are reported to the district-level FP. The facility-level EBS FP triages, verifies signals, and reports events up to the district level. In the absence of the local level, surveillance officers at small facilities and community health worker supervisors report signals up to the district level or could be trained to verify facility and community level signals, respectively.

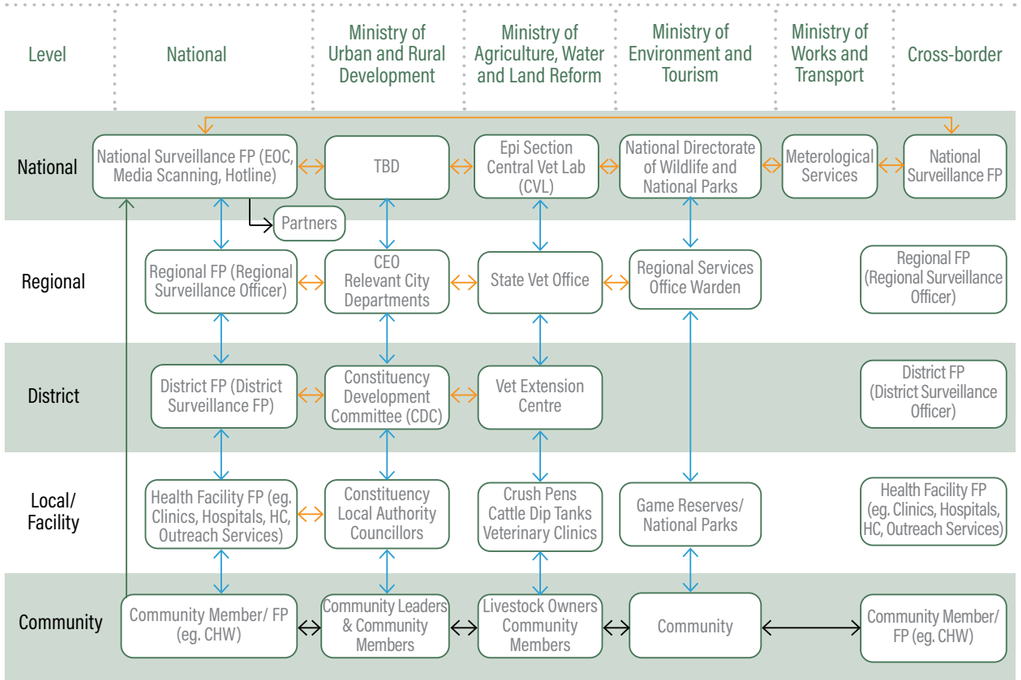


Figure 5: Flowchart for EBS implementation, indicating the flow of data collected through various EBS sources as well as the feedback loop(Adopted from: Namibia Event-based surveillance guideline)

IV. Food Safety and Food Security

The One Health approach goes beyond the detection and control of emerging diseases. Future improvements in food safety and public health will largely depend on how well sectors manage to collaborate using a One Health approach. Without knowledge of the incidence and burden of disease associated with hazard/food combinations, prioritization of mitigation action will be difficult and food safety improvements will be largely unsuccessful. Data on occurrence and disease burden from foodborne hazards combined with knowledge of source attribution will be crucial.

In terms of the Namibian Constitution, Namibia has ratified and acceded to a number of international instruments dealing specifically with sanitary and phytosanitary (SPS) issues and covering certain foods for human consumption namely fruits, vegetables, meat and meat products, milk and milk products. These instruments (World Trade Organization (WTO), WOAH, International Plant Protection Convention (IPPC) and Codex Alimentarius (food safety)) are legally binding in Namibia. Based on the background above the Food Safety Bill was developed with the aim of strengthening the assessment, management and communication of food safety risks.

The Food and Agriculture Organization (FAO) states that food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Nutrition must be prioritised in food systems, shifting to approaches which ensure safe, healthy and sustainable produced food, which is the most accessible, affordable and desirable choice for all.

Food systems are not always able to deliver healthy and sustainable diets. This is true in food systems that do not support productive livelihoods and diverse production As the 2020 Global Nutrition Report shows, “existing agriculture systems are largely focused on an overabundance of staple grains like rice, wheat and maize, rather than producing a broader range of more diverse and healthier foods, like fruits, nuts and vegetables”.

This is also particularly true in current food systems that rely mainly on industrial agriculture (highly dependent on chemical input, standardized seeds or genetically modified organisms). According to the International Panel of Experts on Sustainable Food Systems (IPES) food is “the pathway offered by industrial agriculture combined with well-functioning trading systems that allow a variety of different foodstuffs to be accessible to consumers in a given place.

The diversity of produce delivered by international trade has mainly benefited wealthy consumers in high income countries, while poor people in low income countries continue to be unable to afford the diversity available on these markets.”

Food and the complex systems involved in the pathways from production to consumption sit at the nexus of the human–animal–plant–environment. The ways in which food is produced may not only affect the safety of the final product, but also the health and welfare of animals, the health of plants and the contamination of the environment. Reciprocally, the environment of food production and the health of animals and the contamination of plants may impact food safety. This close interconnectivity means a One Health approach is critical to addressing food safety, and food safety is critical to promoting One Health.

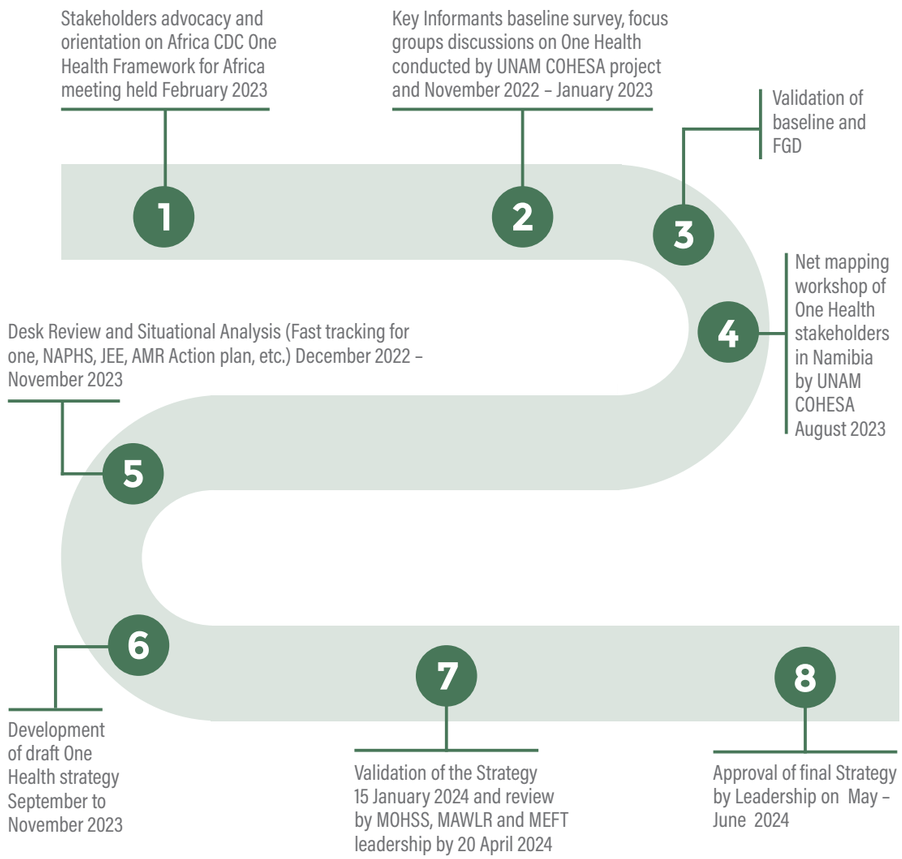
V. IHR Regulations, 2005 and NAPHS (2021-2025)

Namibia, together with other member states in the WHO/AFRO region, is committed to implementing the WHO IHR Monitoring and Evaluation Framework. This includes the voluntary Joint External Evaluation (JEE) of IHR core capacities that should be followed with a national action plan to achieve and sustain core capacities. Since adoption of the IHR, Namibia has carried out several assessments of country capacity to prevent the likelihood, and reduce the consequences of outbreaks and other public health hazards, and build national capacities for early detection and effective response to public health emergencies and other events of public health concern. To fulfil Article 54 of the IHR 2005, Namibia conducted the JEE in December 2016. The JEE highlighted the commitment of the government of Namibia to strengthen health security, the importance of national financing for sustainability and the role of parliaments in national funding decisions, the key role of community engagement, private sector engagement and the importance of resilient health systems in health security. This meeting further emphasized that strong government ownership, leadership and advocacy are needed. Furthermore, continuous active partnerships of all sectors are required to develop and implement the NAPHS and to fill identified resource and financial gaps.

The plan takes into account a set of guiding principles and core values such as resilience, country ownership and leadership, community engagement, partnership, inter-sectoral and multidisciplinary collaboration which is evidence-led and forward looking, and the One Health approach.

2. Methodology

The following diagram describes the chronological approach of the development of the One Health National Strategy in Namibia:



With support from One Health partners, the One Health Platform engaged stakeholders from MoHSS, MAWLR, and MEFT and others in a series of strategic planning workshops and meetings and mapping exercises. This document captures the priorities, outputs, and commitments from those engagements and desk review on existing One Health mechanisms and interventions in Namibia. Based on the above, the development of the One Health National Strategy was conducted and validated with the active participation of different One Health working groups.

VI. Tripatrite One Health National Strategy

The Tripartite One Health National Strategy recognizes the interdependence of human, animal, and environmental health and advocates for a collaborative, holistic, and multidisciplinary approach to address global health challenges. This approach is increasingly important in a world where human activities and environmental changes can profoundly affect health outcomes for all living organisms.

Principles of the One Health Approach in Namibia

The complexity and interconnectedness of the health challenges threatening humans, animals, plants, and the environment, where they coexist, require holistic, integrated solutions with a systemic approach that incorporates wider structural factors, as well as systemic prevention measures integrating the health of humans, animals, plants and the environment.

In Namibia One Health is regulated under the national frameworks, which includes; the Disaster Risk Management Act (Act No. 10 of 2012), the Public and Environmental Health Act (Act No. 1 of 2015), the AMR National Strategy, the NAPHS, Integrated Disease Surveillance and Response Technical Guidelines (IDSR), and the National Development Plan 5 (NDP5).

One Health emphasizes collaboration among professionals from various disciplines, including human health, veterinary medicine, environmental science, and other relevant fields. In Namibia, this involves cooperation between MoHSS, MAWLR, and MEFT and other stakeholders. The three ministries have collaborated well in the past in responding to outbreaks such as Cholera, Rift Valley Fever, CCHF, Anthrax, Hepatitis E, Rabies, COVID-19 and Avian Influenza (H5N1) with high morbidity, mortality, and socio-economic impact.

The One Health approach has proven to contribute to positive outcomes in response to various public health events. For example, an investigation of the anthrax outbreak in wildlife in Bwabwata National Park in 2017 (northeast Namibia) highlighted a successful public health outcome with zero human or livestock cases.[11] In response to this outbreak, a swift response in organizing Post-Exposure Prophylaxis (PEP) dissemination, community education, livestock vaccination, and carcass disposal contributed to the prevention of anthrax transmission to humans and livestock. This investigation emphasized the importance of a multi-agency coordinated response for zoonotic disease outbreaks and continued efforts to raise awareness of the risks of consuming meat from animal carcasses in anthrax-endemic areas.

The Disaster Risk Management Committee (DRMC) in the Office of the Prime Minister (OPM) is the highest multisectoral body in the country providing advice on matters concerning disaster risk management including One Health events. Collaboration between line Ministries and stakeholders for different thematic areas is enacted through the IHR Focal Point, AMR TWG, and the National Health Emergency Management Committee (NHEMC).

The 2016 JEE spotlighted a lack of clarity around the participation, roles, responsibilities, relationships, and authority of key organizations including the OPM, the ministries of environment, wildlife, and home affairs, port authorities, and other relevant stakeholders. This presents the risk of losing precious time for ministerial-level decision-making in the event of rapidly escalating situations. Coordination bodies and formal policy documents will provide advance and ensure that all stakeholders act within clear lines of responsibility and authority.

The National Action Plan for Health Security (NAPHS) was developed in 2017 and launched in 2020 to mitigate the gaps identified during the JEE in 2016. The vision of NAPHS is to have a well prepared unified One Health system to prevent, promptly detect and effectively respond to public health threats.

In collaboration with CDC, a Namibia Field Epidemiology and Laboratory Training Program (NamFELTP) was established 2012. The programme has, since its founding, continued to enlist and educate the nation's public health workforce in order to fill deficiencies in the provision of healthcare services, epidemic response, laboratory sciences, and other areas in a One Health Approach. NamFELTP trainees from relevant Ministries and agencies, including MoHSS, MAWLR, Ministry of Defence (MoD) and NIP are trained to facilitate a multidisciplinary and One Health approach towards public health preparedness and response.[12]

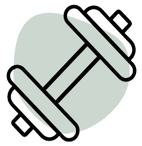
In 2021, the Ministers of MAWLR, MOHSS, and MEFT signed a United against Rabies Statement to demonstrate Namibia's commitment to eliminate rabies, aligned to the global strategic plan for the elimination of dog-mediated rabies by 2030. WOAH endorsed Namibia's Official Control Programme for Rabies in 2021, which is currently implemented by the Directorate of Veterinary Services to control and eventually eliminate dog-mediated rabies.

As part of the development of this national strategy, stakeholders assessed the strengths and weaknesses of One Health development in Namibia, including within the national platform and multi-stakeholder engagement related to resource mobilization and funding sources, disease surveillance/ prevention and control, environmental conservation and health, capacity building and training, research and innovation, laboratory capacity, food safety, bio-safety and bio-security, communications, and

public engagement, risk assessment and response plans, legal and policy frameworks and partnerships. The analysis also identified opportunities and threats in the external environment, including the legislative, socio-economic, environmental, climate change, technological and environmental dimensions. These exercises have formed the backbone for the development of the national One Health National Strategy.

VII. SWOT analysis

Strengths and Weaknesses Identified for One Health in Namibia



STRENGTHS

- Political and Government support and commitment from bilateral and multilateral partners.
- Existence of in-country capacity at the national level for formalization and implementation of One Health interventions.
- A national disaster risk management committee in the OPM chaired by the Secretary to Cabinet and public health emergency management committees has been established at national, regional, and local authority levels.
- One Health interventions are being conducted during animal and human disease outbreaks.
- Strong commitment from all the stakeholders and the technical teams in the three key line ministries (MoHSS, MAWLR, and MEFT) to adopt the One Health approach.
- Existence of a field epidemiology training program that encompasses the One Health approach.

WEAKNESSES

- Absence of One Health Tripatite MOUs/structured communication and coordination mechanisms.
- Absence of a national One Health strategy and legal framework for the implementation plan.
- Limited competent workforce at the subnational levels (subject matter expertise)/ limited practitioners with OH core competencies.
- Absence of Joint Risk Assessment by three ministries to identify, assess, manage and reduce risks from zoonotic diseases.
- Inadequate integration of the One Health concept in the curricula of institutions of higher learning and basic education.
- Lack of understanding of the One Health approach among relevant service providers and community members.

- Existence of community-based organizations (CBOs) and structures for human, animal, and environmental health that can be catalysts for the implementation of One Health activities at the community level.
- A National Public Health Institute is in the process of being established where One Health is embedded.
- Several laws and policies exist to support the implementation of the One Health Strategy (Public Health and Environmental Act (Act No. 1 of 2015, Animal Health Act (Act No. 1 of 2011), Environmental Management Act (Act No. 7 of 2007) including regulations, Disaster Risk Management Act (Act No. 10 of 2012).
- Existence of National Antimicrobial Action Plan (2017-2021).
- Existence of laboratory systems and networks in both human and animal health (UNAM Biosafety level 3, NIP, Central Veterinary Laboratory (CVL).
- Existence and implementation of an IDSR strategy and other surveillance SOPs and guidelines, which also includes surveillance of zoonosis.
- Existence of favorable government policies and exemplary political commitment to human and animal health and the environment.
- Existence of organized human and veterinary surveillance and early warning systems for early detection of public health threats.
- Availability of basic Infrastructure and facilities research on OH-related threats.

- Limited resources to support OH initiatives and for human, animal, and environmental surveillance of emerging and re-emerging zoonotic diseases.
- Limited mechanisms for analyzing and sharing data among One Health institutions.
- Absence of OH health communication advocacy strategy.
- Lack of local laboratory capacity for detection and sequencing of emerging and remerging pathogens.
- Insufficient number of accredited laboratories with higher biosafety levels.
- Inadequate workforce in animal and environmental health.
- Country-specific zoonotic diseases/ events not prioritized.
- Inadequate resources.
- Lack of integration of OH approach into climate change resilience strategy.
- Food safety in the context of OH not prioritized by relevant sectors.
- Non-adherence and non-compliance with waste management laws and regulations (Environmental Management Act No. 7 of 2007).
- Lack of resources for research and innovation in OH systems for early detection of public health threats.
- Availability of basic Infrastructure and facilities research on OH-related threats.

Opportunities and Threats Identified for One Health in the Country

OPPORTUNITIES

- Existence and implementation of NAPHS 2021-2025 signed by Ministers of the three ministries.
- Potential and readiness for the establishment of the national One Health steering committee to spearhead the process of the design and implementation of the One Health strategy.
- Global interconnectivity and international collaboration on OH and overall public health security.
- Namibia is a signatory to IHR, SPS agreement under WTO, United Nations Framework Convention on Climate Change (UNFCCC), Global Health Security Agenda GHSA), the Nagoya Protocol relating to Fair and Equitable Utilization of Genetic Resources, Convention on Biological Diversity (CBD), Rotterdam Convention on pesticides management, Basel Convention on the Control of the Transboundary Movement of Hazardous Wastes and their Disposal, CITES (Convention on International Trade in Endangered Species of wild fauna and flora) and other conventions and treaties.
- Existence of global, continental, and regional One Health Frameworks, guidance, and strategies Africa CDC OH Framework, Quadripartite One Health Joint Plan of Action (OH JPA).
- Government commitment and leadership in climate change mitigation and green economy.
- Available ICT infrastructure to enable information sharing and digitalization of OH surveillance system.
- Potential for future partnerships with global institutions in education and research on One Health.

THREATS

- Economic disparities and a high level of poverty increases vulnerability of humans, animals, plants and their shared environment.
- Country is vulnerable to climate change (persistent and reccurent drought, floods and health emergencies and pest invasions).
- Lack of in-country and regional manufacturers of laboratory consumables/reagents and equipment.
- World geopolitical conflicts and population displacement.
- Global economic recession.
- High inflation rate.
- Persistence of negative socioeconomicand environmental factors.
- Increased interaction between humans and animals due to habitat encroachment.
- Emergence of antimicrobial resistance and other emerging and re-emerging pathogens.
- Disruption in the eco-system (bush encroachment, land degradation).
- Climate change.
- Porous borders with some neighbouring countries.
- Lack of new production and limited utilization of technology products, systems and applications.

The One Health National Strategy is a comprehensive document developed by a country or a region to outline its approach and strategies for implementing the One Health framework at national or regional level. These plans are designed to address specific health challenges that involve the interconnectedness of human, animal, and environmental health and are typically tailored to the unique context and needs of the country or region in question.

The One Health National Strategy seeks to address complex health issues at the intersection of human health, animal health, and the environment. Its overarching goals and objectives promote collaboration among various disciplines and sectors to achieve improved health outcomes for all in the country.

Key components and elements of the One Health National Strategy

Vision

To be a nation promoting healthy ecosystems to minimize risks and impacts of emerging, and re-emerging health threats at the human, animal, plant and environmental interface.

Mission Statement

To have a strategic, dynamic, and functional multisectoral coordinating mechanism implementing the One Health approach to advance human, animal, plant, and environmental health through multidisciplinary and intersectoral collaboration.

Goal

To establish and institutionalize a sustainable One Health approach across all sectors and at the community level in Namibia.

Thematic Areas and Strategic Objectives

The objectives, strategies, and activities to be implemented across the five-year plan consist of six action tracks. These are outlined in the resulting framework and were derived from a country SWOT analysis and the global targets set out in the OH JPA (2022- 2026.)

ACTION TRACKS

1 Enhancing One Health capacities to strengthen health systems.

2 Reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics.

3 Controlling and eliminating zoonotic, neglected tropical and vector-borne diseases.

4 Strengthening the assessment, management, and communication of food safety risks.

5 Curbing the silent pandemic of Antimicrobial Resistance.

6 Integrating the environment into One Health.

One Health is the idea that the health of people is connected to the health of animals and our shared environment.

When we protect **one**, we help protect **all**.

Thematic areas and strategic objectives as set out in the OH JPA (2022-2026)

Thematic Areas	Strategic Objectives	Action Track
1: Governance and Capacity Building	To establish a multisectoral coordinating mechanism.	1
	To assess and review the existing legal frameworks for the operationalization of the OH strategy.	
	To promote OH coordination and linkages among partners.	
	To secure sustainable resource allocation for OH.	
	To strengthen the capacity for OH in the country.	
	To monitor the performance of One Health capacities.	
2: Research and Innovation	To establish the OH Agenda on Research and Innovation.	1
3: One Health Advocacy	To create awareness of zoonotic diseases/ events and the OH approach among the Namibian population.	2
4: Surveillance and Response to OH-related Public Health Threats	To prioritize One Health-related threats for Namibia.	2 3
	To capacitate the detection and diagnosis of the priority zoonotic diseases in human, animal, and environmental threats through a robust laboratory system.	2 3
	To establish an AMR surveillance system in the context of OH.	5
5: Cross-cutting (Food safety, environment, and climate change in the context of OH)	To increase awareness on food safety and enviromental protection.	4 6
	To support the development of implementation of food safety standards.	1 2
	To support the development of implementation of food safety standards.	1 2
	To support environmentally friendly agricultural practices.	1 2
	To reduce greenhouse gas emissions from food production	1 2

Organizational Functions

This section outlines the governance structure responsible for overseeing and coordinating One Health activities in Namibia, including the roles and responsibilities of various government agencies, ministries, and stakeholders.

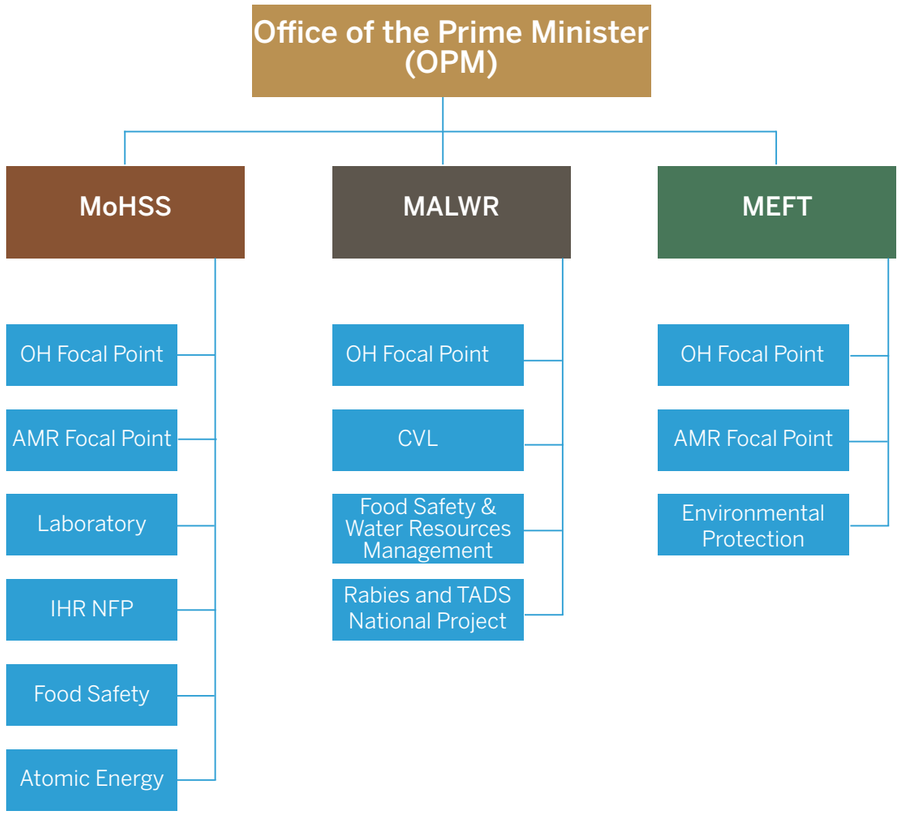


Figure 6: Proposed governance structure overseeing One Health activities in Namibia

One Health Multisectoral Coordination Committee

The One Health Multisectoral Coordination Committee (OHMCC) shall coordinate and strengthen optimal use of available resources, foster synergies and avoid duplication of efforts in the fight against health risks in the animal, human and environment interface in the support of Member States. The OHMCC will work with national and international stakeholders to design and implement programmes, policies, legislation and research in which multiple sectors communicate and work together to effectively prepare for detect, assess, and respond to shared health threats and achieve better public health outcomes. The OHMCC will provide leadership by defining the strategic direction, convening stakeholders and partners and coordinating action and support across the country.

This coordination committee will simultaneously aim to align its efforts with actions and interventions undertaken by the other partners and OMA's The OHMCC is comprised of representatives from various Ministries and academic institutions. The OHMCC may co-opt non-governmental organizations, community-based organizations (CBOs), expert groups, and cooperating partners, including multilateral and bilateral cooperating partners. The Epidemiology Divisions in MoHSS and MAWLR and Wildlife and National Parks Division in MEFT (specify the Unit/Division) shall assume the secretariat functions of the OH Steering Committee.

The OHMCC will be composed of the following offices/units/directorates:

- Deputy Director Disaster Preparedness and Management Unit (OPM)
- Epidemiology Division, Health Information and Research Directorate (MoHSS)
- AMR focal point, National Medicines Policy Coordination - Pharmaceutical Services (MoHSS)
- Family Health and Public Environmental Health Divisions, Directorate of Primary Health Care (MoHSS)
- Deputy Director National Medicines Policy Coordination - Pharmaceutical Services (MoHSS)
- Division of Epidemiology, Import and Export Control (MAWLR))
- Division of Veterinary Public Health (MAWLR)
- Division of Diagnostic Services and Research (MAWLR)
- Division of Animal Disease Control (MAWLR)
- Directorate of Wildlife and National Parks (MEFT)
- Directorate of Forestry (MEFT)
- Directorate of Scientific Services, Wildlife Veterinary Services (MEFT)
- Three representatives from academic institutions with One Health expertise (human, animal, plant and environment, jurists, social scientists)
- Quadripartite OH technical programme officers (WHO, WOAH, FAO, UNEP)
- FLI
- RKI
- Africa CDC
- CDC Namibia
- One representative from local NGOs/CBOs,
- One representative from expert groups
- One Health FPs in line Ministries will serve as secretariat to the OHMCC.

Roles and Responsibilities of One Health

The One Health Executive Group will provide leadership and governance, and define the strategic direction and priorities for One Health in the region. This will be done in close communication and collaboration with partner organizations, civil society, academia and the private sector.

The OHMCC (Secretariat) will keep oversight and coordinate technical support as well as strengthen One Health efforts at national, regional and local authority level. This will be achieved by making better use of available resources, fostering synergies between stakeholders and avoiding duplication of efforts by the tripartite and its partners.

The defined area of operation of the National One Health Coordination Mechanism includes problems arising from antimicrobial resistance (AMR), zoonotic diseases (e.g. food-borne diseases, rabies and influenza) and other One Health issues that exist or emerge within the interface of animal health, food, agriculture and human health, posing a possible or probable threat on the human population within the region.

Technical Working Groups

The technical Working groups (TWGs) will be composed of technical representation from various Ministries, universities (UNAM and Namibia University of Science and Technology (NUST)), NGOs and cooperating partners who will be be reporting to different thematic areas as alligned in the M&E framework.

Roles and responsibilities

a) One Health Surveillance and Laboratory Systems Technical Working Group

By integrating the existing surveillance and laboratory systems, the TWG shall:

- Enhance One Health surveillance and laboratory systems by building from the existing surveillance and laboratory systems.
- Prepare One Health specific guidelines for public health events surveillance;
- Prepare and implement early warning system for One Health related public health events; and
- Meet quarterly/when needed.

Antimicrobial Resistance Technical Working Group

Located within the Surveillance and Laboratory TWG, the roles and responsibilities of the Antimicrobial Resistance TWG are:

- **Coordination and Collaboration:** Facilitate communication and collaboration between stakeholders from human health, animal health, and environmental sectors. Ensure a unified approach to combat AMR.
- **Policy Development:** Contribute to the development of comprehensive policies addressing AMR that align with the OH approach. These policies should consider the interconnected nature of health across humans, animals, and the environment.
- **Surveillance and Data Sharing:** Implement and oversee surveillance systems for monitoring AMR across human and animal populations and in environmental settings. Promote the sharing of relevant data among sectors to facilitate a holistic understanding of the AMR landscape.
- **Education and Awareness:** Develop and implement educational programs to raise awareness about AMR among healthcare professionals, veterinarians, farmers, and the general public. Emphasize the importance of responsible antimicrobial use in all sectors.
- **Research and Innovation:** Foster research initiatives that explore innovative solutions to address AMR challenges. Encourage cross-disciplinary research projects that incorporate insights from human health, animal health, and environmental science.
- **Regulatory Compliance:** Work towards harmonizing regulations and guidelines related to antimicrobial use across human health, veterinary medicine, and agriculture. Ensure adherence to international standards and best practices.
- **Capacity Building:** Provide training programs for healthcare professionals, veterinarians, and environmental scientists to enhance their understanding of AMR and promote best practices in antimicrobial stewardship.
- **Risk Assessment and Management:** Conduct risk assessments related to AMR emergence and transmission. Develop strategies for risk management that consider the implications for human health, animal health, and the environment.
- **International Collaboration:** Collaborate with international organizations, neighboring countries, and global initiatives to share experiences, best practices, and resources in the fight against AMR.
- **Monitoring and Evaluation:** Establish mechanisms for ongoing monitoring and evaluation of AMR initiatives. Regularly assess the effectiveness of interventions and adjust strategies as needed to address emerging challenges.

b) Preparedness and Response for OH-related threats Technical Working Group

In collaboration with NHEMC and NDRMC, the roles and responsibilities of the Epidemic Preparedness and Response TWG in relation to humans, animal and environmental public health threats are to:

- Prepare SOPs for epidemic preparedness and response;
- Prepare proposals on epidemic preparedness and response for resource mobilization;
- Provide technical guidance to the nation on public health epidemic preparedness and response;
- Prepare workplans and budgets for the national epidemic preparedness and response;
- Prepare national reports on epidemic preparedness and response and present them to the OHCC; and
- Execute all other actions and inetrevetions as per NHEMC and NDRMC protocols.

c) Research and Innovation Technical Working Group

The Research and Development TWG will be comprised of members from academia, line ministries, research institutions and other sector institutions in One Health. The roles and responsibilities of the Research and Development TWG are to:

- Enhance knowledge management and promote indigenous knowledge on One Health;
- Coordinate, develop and implement One Health research and innovation and knowledge management activities;
- Inniate and conduct grants writing for Research and Innovation on OH;
- Operationalize OH strategy under the respective thematic area;
- Compile and disseminate annual plan as per strategy; and
- Report to OHCC on the progress to the implementation of OH strategy.

d) Advocacy, Communication and Training Working Group

The roles and responsibilities of the Advocacy and Communication and Training TWG are to:

- Develop and implement communication and advocacy strategies;
- Facilitate and coordinate One Health Risk Communication and Community Engagement activities; and
- Develop and disseminate quality Information, Education and Communication (IEC) and Behaviour Change Communication (BCC) materials on OH.

VIII. Quadripartite Partners and other One Health Stakeholders in Namibia

At global level, the Quadripartite organizations (FAO, UNEP, WHO, and WOAH) developed a guide to implementing the One Health Joint Plan of Action (OH JPA) 2022-2026 to guide the member states. The actions presented in the OH JPA and this accompanying guide aim to inspire greater and more targeted One Health action at every level, enhancing capacities and capabilities to prevent and mitigate risks and threats, with the ultimate aim of promoting sustainable wellbeing and health for a thriving planet.

In Namibia, the MoHSS, MAWLR and MEFT form the tripartite ministries, heading the One Health concept. These ministries are responsible for the implementation of the Global Action Plan (GAP) on AMR as well as the OH JPA. The OH JPA is linked and aligned to the GAP by complementing and facilitating its implementation through the reinforcement of collaborative efforts. The quadripartite organizations support these tripartite ministries in alignment with their mandates.

By establishing these inter-ministerial collaborations, Namibia aims to enhance its capacity for addressing complex health challenges holistically. This integrated approach ensures that various sectors work together synergistically, contributing to a more effective response to health issues that transcend traditional boundaries. The partnerships forged between government ministries and international organizations underscore Namibia's commitment to the principles of One Health, where the collective effort of diverse stakeholders is essential for promoting the wellbeing of communities and ecosystems.

The MoHSS in Namibia collaborates extensively with WHO, forming a robust partnership to address healthcare challenges and promote public health initiatives. Simultaneously, MAWLR engages in close cooperation with FAO and WOAH, fostering collaborative efforts to address issues related to agriculture, water resources, and animal health. WHO and FAO support the tripartite in implementing the strategies outlined in the NAAP, which is headed by the tripartite.

Furthermore, FAO extends its collaborative endeavors to include partnerships with the MEFT and the Ministry of Fisheries and Marine Resources (MFMR). This cooperative engagement reflects a comprehensive approach within the One Health framework, acknowledging the interconnected nature of human, animal, and environmental health.

The United Nations Environment Programme (UNEP) is not actively involved in the One Health approach in Namibia. This means that only WHO, WOAH and FAO provide guidance on the implementation of the OH JPA. Fortunately, multiple stakeholders have played a pivotal role in implementing the action tracks of the JPA. Stakeholders

such as Africa CDC, FLI, RKI, and COHESA actively participate in the establishment and implementation of the One Health strategy in Namibia.

Traditionally, the Ministry of Fisheries and Marine Resources (MFMR) has not been directly integrated into the comprehensive One Health strategy, which typically encompasses human, animal, and environmental health. However, recognizing the intrinsic linkages between terrestrial and aquatic ecosystems, it is imperative to extend the scope of the One Health perspective to include the MFMR. Engaging the MFMR in the One Health framework will ensure a more holistic and interconnected approach, acknowledging the interdependence of human, animal, and environmental health. By incorporating fisheries and marine animal health into the broader One Health initiative, Namibia can foster collaboration and coordination across different sectors and a more comprehensive understanding of health dynamics at the interface of land and sea.

One Health linkages with existing interventions

Disease Surveillance and Monitoring

Disease Surveillance and Monitoring provides detailed strategies for enhancing surveillance systems to detect and respond to emerging diseases affecting humans and animals. Enhancing these surveillance systems is a critical component of the OH approach.

Strategies and considerations for strengthening surveillance systems in Namibia based on the One Health approach:

Integrated Surveillance: Develop and implement integrated surveillance systems that capture data on human, animal, and environmental health in a coordinated manner. This involves sharing information and data across sectors, such as public health, veterinary medicine, and environmental science.

Early Warning Systems: Establish early warning systems that can quickly detect unusual patterns of disease in both human and animal populations. These systems should include mechanisms for real-time data collection, analysis, and reporting.

Sentinel Surveillance: Implement sentinel surveillance in key locations where the risk of disease emergence is high. This involves monitoring specific animal or human populations that are likely to serve as early indicators of disease transmission.

Syndromic Surveillance: Develop syndromic surveillance systems that track clinical signs and symptoms in both humans and animals. This can help identify patterns of illness before a specific pathogen is identified.

Laboratory Capacity: Strengthen laboratory capacity for both human and animal diagnostics. This includes equipping laboratories with the necessary equipment, personnel, and resources to identify emerging pathogens.

Cross-Species Surveillance: Conduct surveillance in wildlife populations, as many emerging diseases originate in animals. Collaborate with wildlife agencies and organizations to monitor wildlife health and detect potential spillover events.

Data Sharing and Communication: Establish mechanisms for sharing surveillance data and information across relevant agencies and organizations. This includes secure and timely communication channels to facilitate rapid response.

Capacity Building: Train healthcare workers, veterinarians, and environmental scientists in surveillance techniques, data collection, and reporting. This helps ensure that the surveillance system operates effectively at all levels.

Standardized Case Definitions: Develop standardized case definitions for both human and animal diseases to facilitate consistent reporting and data analysis.

Public Reporting: Encourage healthcare facilities, veterinary clinics, and the public to report unusual or suspicious cases of illness promptly. Public engagement can be a valuable source of information.

Vector Surveillance: Monitor vectors, such as mosquitoes or ticks, that can transmit diseases between animals and humans. This is particularly important in areas where vector-borne diseases are a concern.

Environmental Monitoring: Include environmental data in surveillance efforts, such as tracking changes in temperature, rainfall, or other ecological factors that can influence disease transmission.

Risk Assessment: Use surveillance data to conduct risk assessments and identify areas or populations at higher risk for disease emergence. This can guide targeted interventions.

International Collaboration: Collaborate with neighbouring countries and international organizations to share information and coordinate responses to cross-border health threats.

Legal Framework: Ensure that there is a legal framework in place to support data sharing, cross-sectoral collaboration, and the implementation of public health measures when necessary.

Simulation Exercises: Conduct regular exercises and drills to test the effectiveness of the surveillance system and the response to emerging disease threats.

Feedback and Continuous Improvement: Establish mechanisms for feedback and continuous improvement of the surveillance system based on lessons learned from past outbreaks and responses.

By implementing these strategies, Namibia can enhance its ability to detect and respond to emerging diseases that affect both humans and animals, ultimately reducing the risk of epidemics and pandemics and protecting public health.

Prevention and Control

Prevention and control outlines measures to prevent and control zoonotic diseases, including vaccination campaigns, improved animal husbandry practices, and public health interventions. These measures should be implemented in a coordinated manner, involving various stakeholders such as government agencies, healthcare professionals, veterinarians, environmental scientists, community leaders, and the public. Regular evaluation and adaptation of strategies based on emerging threats and lessons learned from outbreaks are crucial for effective zoonotic disease prevention and control. Preventing and controlling zoonotic diseases requires a multifaceted approach that addresses the various pathways through which these diseases can emerge and spread.

Measures to prevent and control zoonotic diseases, including vaccination campaigns, improved animal husbandry practices, and public health interventions:

1. Vaccination Campaigns

Animal Vaccination: Implement widespread vaccination campaigns for animals, particularly domesticated animals that can transmit diseases to humans. This includes vaccinations against diseases like rabies, brucellosis, and avian influenza.

Human Vaccination: Develop and promote vaccines for zoonotic diseases that can be transmitted directly from animals to humans. Examples include vaccines for diseases like COVID-19, influenza, and Hepatitis E.

2. Improved Animal Husbandry Practices

Biosecurity Measures: Encourage and enforce biosecurity measures on farms and in animal markets to reduce the risk of disease transmission between animals and humans.
Antimicrobial Stewardship: Promote responsible use of antibiotics and antimicrobials in animal agriculture to combat the emergence of AMR.
Hygiene and Sanitation: Improve hygiene and sanitation practices in livestock facilities to reduce the risk of contamination and disease transmission.
Disease Monitoring: Establish systems for monitoring and early detection of diseases in animals, and implement quarantine and isolation measures when necessary.
Animal Welfare: Ensure that animals are raised under conditions that promote their health and wellbeing, which can reduce stress and disease susceptibility.

3. Public Health Interventions

Surveillance and Early Detection: Enhance surveillance systems to monitor zoonotic diseases in humans, including tracking disease patterns and investigating outbreaks.
Contact Tracing: Identify and trace contacts of individuals exposed to zoonotic pathogens to prevent further transmission.
Education and Awareness: Educate the public about zoonotic disease risks, transmission routes, and prevention measures through public health campaigns.
Vector Control: Implement vector control programs to reduce the transmission of diseases carried by vectors such as mosquitoes, ticks, and fleas.
Safe Food Handling: Promote safe food handling practices, including proper cooking and food preparation, to reduce the risk of foodborne zoonotic infections.
Behavioral Change: Encourage behaviors that minimize the risk of zoonotic disease transmission, such as avoiding contact with sick animals and practicing good hand hygiene.
Quarantine and Isolation: Isolate and treat individuals infected with zoonotic diseases to prevent further spread.

Antimicrobial Resistance (AMR)

Addresses strategies to combat AMR through responsible antimicrobial use in both human and animal health settings.

Prudent Use of Antimicrobials: Promote responsible use of antibiotics in both human and animal health to reduce the development and spread of AMR.

Environmental Conservation and Health

Environmental Conservation and Health includes initiatives related to environmental stewardship, such as efforts to mitigate the impact of climate change, preserve biodiversity, and reduce pollution.

Habitat Protection: Implement conservation measures to preserve natural habitats, reducing the likelihood of human-wildlife interactions and disease spillover.
Wildlife Monitoring: Conduct surveillance in wildlife populations, especially those known to harbor zoonotic pathogens.

Capacity Building and Training

Building capacity and training on the One Health framework is an ongoing process that requires commitment from various stakeholders, including governments, academic institutions, NGOs, and healthcare organizations. By investing in capacity building, Namibia can strengthen its collective ability to address emerging health threats and promote the wellbeing of both humans and animals. This includes building capacity and providing training for healthcare professionals, veterinarians, and other relevant personnel to work within the One Health framework. This is crucial to ensure that professionals across various sectors can effectively collaborate and address complex health challenges.

Outline of plans for building capacity and training on the One Health framework:

1. Needs Assessment

- Conduct a thorough needs assessment to identify the specific gaps and requirements in capacity and training for the One Health approach. This assessment should involve stakeholders from the human health, animal health, and environmental sectors.

2. Curriculum Development

- Develop comprehensive One Health training curricula that cover key topics, including zoonotic disease surveillance, environmental health, AMR, and interdisciplinary collaboration.
- Ensure that the curriculum is adaptable to different levels of expertise, from introductory courses for beginners to advanced training for professionals.

3. Training Programs

- Offer a range of training programs, including workshops, seminars, online courses, and formal degree programs, to accommodate different learning preferences and schedules.
- Collaborate with universities, research institutions, and professional organizations to provide accredited One Health training programs.

4. Interdisciplinary Approach

- Emphasize the importance of an interdisciplinary approach throughout the training. Encourage participants to work collaboratively on case studies and projects that involve human health, animal health, and environmental health perspectives.

5. Targeted Audiences

- Tailor training programs to meet the needs of various target audiences, including healthcare professionals, veterinarians, environmental scientists, policymakers, and community leaders.
- Consider the specific requirements of different regions and countries when designing training initiatives.

6. Practical Experience

- Include practical, hands-on components in training programs. This may involve fieldwork, laboratory exercises, or simulation exercises to reinforce learning.

7. Accessible Resources

- Develop and provide accessible learning resources, such as textbooks, online materials, and reference guides, to support ongoing learning and research in the One Health field.

8. International Collaboration

- Foster collaboration with international organizations, such as WHO, FAO WOAH to leverage their expertise and resources in One Health capacity building.

9. Mentorship and Networking

- Establish mentorship programs that connect experienced One Health professionals with emerging talents in the field. Encourage networking opportunities to facilitate knowledge exchange and collaboration.

10. Evaluation and Certification

- Implement a robust evaluation system to assess the effectiveness of training programs. Use feedback from participants to continually improve the curriculum.
- Provide certification or recognition for individuals who complete One Health training programs to validate their expertise.

Research and Innovation

One Health promotes research to better understand the complex interactions between humans, animals, and the environment. This research can lead to innovative solutions for health challenges. One Health encourages interdisciplinary research and collaboration among scientists, veterinarians, ecologists, social scientists, medical scientists, nautral resource management scientists and other experts to better understand the interconnectedness of health. It supports the development of new technologies and interventions to address health challenges and highlights the importance of research and innovation in understanding and addressing OH issues and identifies potential research priorities.

Epidemiological Studies: Conduct research to understand the epidemiology of zoonotic diseases, including reservoir hosts, transmission pathways, and risk factors.
Vaccine Development and Innovation: Invest in research for the development of new vaccines, diagnostics, and treatments for zoonotic diseases.
Invest in research to better understand the ecology, transmission, and emergence of zoonotic pathogens.
Conduct surveillance in wildlife populations to monitor the presence of zoonotic pathogens in reservoir species.

Resources Mobilization

Resources Mobilization describes how the plan will secure funding and resources to support One Health activities.

- Advocate for government and donor support to fund One Health capacity-building initiatives.
- Highlight the benefits of a One Health approach in preventing and mitigating health crises.

Communication and Public Engagement

Communication and Public Engagement includes strategies for communicating One Health principles to the public and promoting awareness and behavior change.

- Promote public awareness of OH principles to encourage community participation in disease surveillance, environmental conservation, and responsible pet ownership.

Risk Assessment and Response Plans

Risk assessment and response plans are essential components of the One Health approach, helping to identify and mitigate health risks that emerge at the intersection of human, animal, and environmental health. One Health risk assessment and response plans are dynamic documents that should be updated regularly to reflect changing conditions, emerging threats, and evolving knowledge. Adopting a collaborative and multidisciplinary approach, One Health can effectively address complex health risks and improve health outcomes.

Legal and Policy Framework

Regulation and Policy

- Enforce regulations and policies that govern the safe handling, transportation, and sale of animals and animal products.
- Strengthen laws related to wildlife trade and protect against illegal wildlife trafficking.

The Balanced Scorecard, Timeline and Budget

In this One Health National Strategy, the balanced scorecard is a framework that translates the strategy into operational objectives that drive the performance of the One Health Framework. As a multidimensional framework, the balanced scorecards outline the summary approach towards implementation of the five-year national strategy by way of linked strategic objectives, measures, targets, strategic initiatives and resource estimates/requirements, accountable Units/Division/Ministry. (Table 1, page 46)

3. Five-Year National Strategy for One Health in Namibia

Implementation plan of the One Health Strategy,2024-2028

Thematic Area 1: Governance and Capacity Building **Goal:** Sustainable and institutionalized One Health Multesectoral Coordinating Mechanism at all government levels								
Strategic Objective	**Strategic Activities**	**Sub-Activities/Milestones**	**Key Performance Indicators**	**Year 1: 2024**	**Year 2: 2025**	**Year 3: 2026**	**Year 4: 2027**	**Year 5: 2028**
1. To Establish a Multisectoral Coordinating Mechanism	1. 1 Develop the OH strategy and Tripatrite One Health MoU	1.1.1 Perform situation analysis of OH in Namibia. 1.1.2 Develop and finalize the OH national strategy. 1.1.3 Finalise and implement the Tripartite One Health MOU in the 1st Quarter of 2024/25. 1.1.4 Conduct a workshop for validation of the strategy by 1st Quarter of 2024/25.	Proportion of deliverables achieved (Situation analysis, endorsement of MoU)	x				
	1.2 Establish the One Health Multisectoral Coordinating Committee (OHMCC) and thematic area sub-committees by 2 Quarter of 2024	1.2.1 Draft the Terms of Reference. 1.2.2Validation of the structure. 1.2.3. Appointment of the OHMCC members and conduct standing committee meetings.	The proportion of deliverables achieved (Structured, ToR, etc)	x				
2. To assess and review the existing legal frameworks for the operationalization of One Health Strategy	2.1 Mapping and review of supportive policies and legislations for One Health Operationalization across different sectors	2.1.1 Hire a consultant to conduct mapping and review. 2.1.2 Conduct validation workshop and Identify and list existing legislation and policies. 2.1.3 Submit to the cabinet the revisions to the existing legislation with support from legal drafters.	The proportion of deliverables achieve (hiring of a consultant, ToR, validation meetings, mapping and validation meetings)	x	x	x		
3. To promote One Health coordination and linkages among partners	3.1 Mapping of Stakeholders and Infrastructure	3.1.1 Conduct a stakeholder analysis to review and Identify available/potential donors and private sector organizations. 3.1.2 Conduct a mapping of animal, environmental and human health infrastructure, and resources.	The proportion of deliverables achieved (mapping and validation meetings)	x		x		
4. To Secure sustainable resource allocation for One Health (two (each year)	4.1 Conduct resource mobilization	4.1.1.Conduct regular fundraising initiatives. 4.1.2 Harmonise OH activities in the plans of governments and partner organizations.	Number of Fundraising initiatives conducted Proportion of Harmonised plans in place	x x	x		x	x
5. To strengthen One Health's capacity in the country by 2028	5.1 Integrate One in the existing pre-service and in-service training program	5.1.1 Develop training modules and conduct for in-service and pre-service.	Proportion of deliverables achieved in developing the One Health Training Program		x			x
6. To monitor the performance of One Health Capacities	6.1 Conduct Joint Risk Assessment	Request for technical assistance and develop a roadmap and ToR for JRA	Proportion of deliverables achieved	x				
	6.2 Conduct Performance Veterinary Performance Systment II for animal Health and Joint External Assessment for IHR capacities	Request for technical assistance and develop a roadmap and ToR for PVSII and JEE	Proportion of deliverables achieved		x	x		

Thematic Area 2: Research and Innovation **Goal:** Developed strategic integrated research, innovation to support the One Health approach in Namibia								
Strategic Objective	**Strategic Activities**	**Sub-Activities/Milestones**	**Key Performance Indicators**	**Year 1: 2024**	**Year 2: 2025**	**Year 3: 2026**	**Year 4: 2027**	**Year 5: 2028**
7. To establish One Health Agenda on Research and Innovation	7. 1 Develop 5-year OH research agenda for Namibia	7.1 .1 Mapping of relevant OH stakeholders. 7.1.2 Organize a 3-day workshop for the relevant stakeholders to draft the OH research agenda. 7.1.3 Conduct the launch of the OH research agenda. 7.1.4 Conduct scientific conferences and grant writing.	The proportion of deliverables achieved (list of relevant, OH stakeholders compiled, meeting) Number of scientific conducted out of planning Proportion of approved scientific papers		x			
	7.2 Establish the burden of Zoonotic diseases (on quality of life and animal productivity)	7.2.1 Conduct research studies on the burden of zoonotic diseases using QUALY, DALY, PALY, and NEOH (Network for Evaluation of One Health).	Burden report generated and findings used for policy brief		x			

Thematic Area 3: One Health Advocacy **Goal:** One Health Strategy popularized to all stakeholders in Namibia								
Strategic Objective	**Strategic Activities**	**Sub-Activities/Milestones**	**Key Performance Indicators**	**Year 1: 2024**	**Year 2: 2025**	**Year 3: 2026**	**Year 4: 2027**	**Year 5: 2028**
8. To Create awareness of zoonotic diseases/events and the One Health approach among the Namibian population	8.1 Develop advocacy communication and strategy	8.1.1 Develop One Health Policy Brief. 8.1.2 DevelopOne Health Information materials in print electronic and social media. 8.1.3 Develop One Health Community engagement tool for community focal points (Community Health Workers, agricultural extension Workers, health committees, Game Rangers and members of various conservancies.	Proportion of people and institutions reached with advocacy and communication strategy out of planned Number of One Health information materials/ products developed out of planning Proportions of regions/ constituencies reached with One Health community engagement tool by community focal points	x				

Thematic Area 4: One Health Surveillance and Response
Goal: Effective prevention, detection, and response to public health threats through the One Health approach

Strategic Objective	Strategic Activities	Sub-Activities/Milestones	Key Performance Indicators	Year 1: 2024	Year 2: 2025	Year 3: 2026	Year 4: 2027	Year 5: 2028
9. To prioritize, prevent and control One Health related threats for Namibia	9.1 Develop a Prioritization list of the zoonotic diseases/ events in Namibia	9.1.1 Conduct a prioritization workshop. 9.1.2 Develop Responses and Contingency Plans and test the pans for outbreak prone zootic diseases/events. 9.1.3 Conduct an Inventory of pathogens in both human and animal health laboratories bi-annually	Proportion of people and institutions reached with advocacy and communication strategy out of planned Number of One Health information materials/ products developed out of planning Proportions of regions/ constituencies reached with One Health community engagement tool by community focal points	x	x	x	x	x
	9.2 Inventory of pathogens for both human and animal health laboratories bi-annually generated	9.2.1 Conduct an Inventory of pathogens in both human and animal health laboratories bi-annually.	Number of emerging and novel pathogens identified	x	x	x	x	x
	9.3 Mapping and integration of different surveillance systems	9.3.1 Analysis of different surveillance systems for human, animal diseases, plant and Environmental hazards 9.3.2 Identify areas of possible integration and development of the integration tools and applications.	Analysis of different systems conducted Areas of possible integration identified Tools and applications developed Stakeholder meeting for validation of tools and applications conducted	x	x		x	x

Strategic Objective	Strategic Activities	Sub-Activities/Milestones	Key Performance Indicators	Year 1: 2024	Year 2: 2025	Year 3: 2026	Year 4: 2027	Year 5: 2028
9. ...continued	9.4 Implement Event-based surveillance (EBS) using the OH approach	9.1.1 Develop National Guidelines and in-service training curriculum for Event BasedS surveillance. 9.1.2 Conduct EBS training for various service providers community resource persons and media personnel. 9.1.3 Adapt and Integrate WHO/ Africa CDC Event Management System into existing reporting health information systems	Proportion of people and institutions reached with advocacy and communication strategy out of planned Number of One Health information materials/ products developed out of planning Proportions of regions/ constituencies reached with One Health community engagement tool by community focal points	x	x	x		
10. To capacitate the detection and diagnosis of the priority zoonotic diseases in human and animal and environmental threats through robust laboratory system	10.1 Enhance the laboratory physical infrastructure, equipment, reagents and consumables, quality management systems to sustain an integrated national laboratory network	10.1.1 Promote the alignment of the Labs to ISO 17025. 10.1.2 Establish Quality control Train the staff on ISO 17025 Apply for accreditation of the labs. 10.1.3 Advocate and Fastrack for the establishment of the Namibian Public Health Laboratory in the National Public Health Institute.	Proportion of labs with improved infrastructure Number of staff members trained on ISO 17025 Advocacy initiatives for Public Health Laboratory establishment Number of laboratory staff trained Training report, list of participants			x	x	

Strategic Objective	Strategic Activities	Sub-Activities/Milestones	Key Performance Indicators	Year 1: 2024	Year 2: 2025	Year 3: 2026	Year 4: 2027	Year 5: 2028
11. To establish an AMR surveillance system in the context of One Health	11.1 Implement the AMR Surveillance	11.1.1 Establish an expert committee within the AMR TWG for surveillance purposes and develop terms of reference (ToR). 11.1.2 Organize a capacity-building workshop for personnel at peripheral labs. 11.1.3 Assess the additional resources needed to enhance the capacity of the national reference laboratory. 11.1.4 Gather data on AMR, compile comprehensive yearly reports, and disseminate findings on AMR trends.	Proportion of activities towards implementation of AMR surveillance	x	x	x	x	x

Thematic Area 5: Cross-cutting (Food safety, environment, and climate change in the context of One Health)
Goal: To build and promote food safety, and environment and mitigate climate change in the context of One Health

Strategic Objective	Strategic Activities	Sub-Activities/Milestones	Key Performance Indicators	Year 1: 2024	Year 2: 2025	Year 3: 2026	Year 4: 2027	Year 5: 2028
12. To increase awareness on Food safety and enviromental protection	12.1 Developing and operationalizing Food safety inand enviromental protection communication and advocacy strategy	12.1.1 Prepare communication and Advocacy Strategy document.	Communication and Advocacy Strategy in place		x			
	12.2 Prepare communication and Advocacy Strategy document.	12.2.1 Disseminate communication and Advocacy strategy through workshops, seminar, etc.	Workshops and seminars held nationally, regionally and in the districts to disseminate communication and Advocacy strategy		x			
13. To support the development of implementation of food safety standards	13.1 Develop and implement robust food safety standards.	13.1.1 Mapping and review of food safety standards.	Number of food safety regulations reviewed/ developed		x	x	x	
14. To support environmentally friendly agricultural practices	14.1 Promote and popularize organic farming methods that minimize chemical inputs and promote soil health.	14.1.1 Conduct research on climate-resilient crop varieties.	Number of research developed and conducted on crop climate-resilience		x	x		
	14.2 Conduct research on climate-resilient crops that can withstand changing environmental conditions.	14.2.1 Collaborate with agricultural universities and research institutions.	Number of collaborators		x	x		

Strategic Objective	Strategic Activities	Sub-Activities/Milestones	Key Performance Indicators	Year 1: 2024	Year 2: 2025	Year 3: 2026	Year 4: 2027	Year 5: 2028
16. To reduce greenhouse gas emissions from food production	15.1 To promote and support energy-efficient technologies in food processing, reducing the carbon footprint.	15.1.1 Upgrade food processing equipment to energy-efficient models. 15.1.2 Monitor energy consumption and optimize processes.	Level of Energy Efficiency Index of food processing technologies	x				x
	15.2 Promote and support the use of renewable energy sources (e.g., solar, wind) in agriculture and food production.	15.2.1 Invest in solar panels, wind turbines, and other renewable energy sources. 15.2.2 Promote energy-saving practices in food production.	Percentage use of renewable energy sources in agriculture and food production	x				x
	15.3 Develop strategies to minimize emissions from livestock, considering their contribution to methane and nitrous oxide.	15.3.1 Implement livestock management practices to reduce methane emissions (e.g., dietary adjustments). 5.3.2 Encourage low-emission technologies (e.g., anaerobic digesters).	Number of strategies for minimising emission developed and adopted	x				x

4. Monitoring and Evaluation Framework: M & E Framework for One Health Activities

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 1: Governance and Capacity Building	1. Sustainable and institutionalised One Health Multisectoral Coordinating Mechanism platform at all government levels	1. To Establish a Multisectoral Coordinating Mechanism	1.1 Multisectoral Coordination Mechanism established and functional	% of deliverables achieved towards establishment and operationalizing of OH	0	100%	1.1.1 Develop the OH strategy and Tripatrite OH MoU	MoHSS, MAWLR, UNAM	300 000	200 000				
							1.2.1 Establish the OHMCC and thematic area sub-committees by 2nd Quarter of 2024	M0HSS, MAWLR, UNAM	50 000	50 000	50 000	50 000	50 000	250 000
		2. To assess and review the existing legal frameworks for the operationalization of OH Strategies	2.1 Existing legal frameworks s reviewed and incorporated in OH Strategy	% of deliverables achieved (hiring of a consultant, ToR, validation meetings, mapping and validation meetings)	0	100%	2.1.1 Mapping and review of supportive policies and legislations for OH Operationalization across different sectors	MoHSS, MAWLR, OPM	100 000	150 000	50 000			300 000
		3. To promote OH coordination and linkages	3.1 Mapping of Stakeholders and Infrastructure for OH conducted and documented	% of deliverables achieved	50	100%	3.1.1 Mapping of Stakeholders and Infrastructure for OH Implementation	MoHSS, MAWLR, UNAM	50 000			50 000		100 000
		4. To Secure sustainable resource allocation for OH (two (each year)	4.1 Resources for OH implementation secured and sustained	Number of resource mobilization conducted out of planned	2	8	4.1.1 Conduct resource mobilization	MoHSS, MAWLR, MEFT, UNAM, Partners	50 000	50 000	50 000	50 000	50 000	250 000
		5. To strengthen OH's capacity in the country by 2028	5.1 In country capacities building OH developed through pre- and in-service training	% deliverables achieved toward development and deployment t of training curriculum	10%	100%	5.1.1 Develop training modules and conduct for in-service and pre-service	MoHSS, MAWLR. MEFT,UNAM, NUST		300 000	150 000	40 000		490 000
		6 .To monitor the performance of OH Capacities	6.1 Monitoring and evaluation of OH core capacities conducted	% deliverables achieved towards One Health Joint Evaluation exercise	0	100%	6.1.1 Conduct Joint Risk Assessment	MoHSS, MAWLR, MEFT, UNAM, Partners		872 053				872 053
				% deliverables achieved towards Performance Veterinary System Evalution	0	100%	6.1.2 Conduct Performance Veterinary System II for animal health and Joint External Assessment for IHR capacities	MoHSS, MAWLR, MEFT, UNAM, Partners		872 053				872 053

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 2: Research and Innovation	Developed strategic integrated research, innovation, and capacity-building agenda to support the One Health approach in Namibia	7. To establish One Health Agenda on Research and Innovation	7.1 OH Research Agenda for Namibia developed	% of deliverables achieved (List of relevant, OH stakeholders compiled, meeting), Number of scientific conducted out of planning, Proportion of approved scientific papers	0	100%	7.1.1 Develop 5-year OH research agenda for Namibia			75 000	75 000			150 000
			7. 2 Burden of Zoonotic diseases established	Burden report generated and findings used for policy brief	0	100%	7.2.1 Establish the burden of Zoonotic diseases (on Quality of Life and animal productivity)			75 000	75 000			150 000
Thematic Area 3: One Health Advocacy	Strategy popularised to all stakeholders in Namibia	8. To Create awareness of zoonotic diseases/events and the One Health approach among the Namibian population	8.1 One Health Communication strategy developed	Proportion of people and institutions reached with advocacy and communication strategy out of planned Number of One Health information materials/ products developed out of planning Proportion of regions/ constituencies reached with One Health community engagement tool by community focal points	0	100%	8.1.1 Develop advocacy communication and strategy	FAO, MoHSS, MAWLR		1 480 000	876 530			2 356 530

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 4: One Health Surveillance and Response	Effective prevention, detection, and response to public health threats through the One Health approach	9. To prioritize One Health-related threats for Namibia	9.1 Prioritization list of the zoonotic diseases/events in Namibia	% of deliverables achieved (List of relevant, OH stakeholders compiled, meeting), Number of scientific conducted out of planning, Proportion of approved scientific papers	0	100%	9.1.1 Develop a Prioritization List of the zoonotic diseases/events in Namibia	FAO, MoHSS, MAWLR		501 646				501 646
			9.2 Inventory of pathogens in both human and animal health	Burden report generated and findings used for policy brief	0	100%	9.2.1 Inventory of pathogens for both human and animal health laboratories bi-annually generated	FAO, MoHSS, MAWLR	30 000	30 000	30 000	30 000	30 000	150 000
			9.3 Development of the integration tools and applications	% of tools/ surveillance systems for human and animal health integrated	0	100%	9.3.1 Mapping and integration of different surveillance systems	FAO, MoHSS, MAWLR			968 678			968 678
			9.4 EBS for human, animal and environmental health developed		25	100%	9.4.1 Implement EBS using the OH approach	FAO, MoHSS, MAWLR	350 000	350 000	150 000			850 000
		10. To capacitate the detection and diagnosis of the priority zoonotic diseases in human and animal and environmental threats through robust laboratory system	10.1 Laboratory capacities for detection and diagnosis of the priority zoonotic diseases in human and animal and environmental threats strengthened	Proportion of labs with improved infrastructure, Number of staff members trained on ISO 17025, Advocacy initiatives for Public Health Laboratory establishment Number of laboratory staff trained, Training report, list of participants	50	100%	10.1.1 Enhance the laboratory physical infrastructure, equipment, reagents and consumables, and quality management systems to sustain an integrated national laboratory network Capacity-building on bio-risk management procedure in the context of OH	WHO, MoHSS, MAWLR			1 725 440	1 725 440		3 450 880

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 4: One Health Surveillance and Response	Effective prevention, detection, and response to public health threats through the One Health approach	11. To establish an AMR surveillance system in the context of one Health	11.1 AMR surveillance established and funtional	Expert committee for AMR Surveillance established Number of staff members trained Comprehensive assessment of the resources needed, including equipment, personnel, and funding, to enhance the capacity of the National Reference Laboratory. Number of AMR reports compiled	0	100%	11.1.1 Implement the AMR surveillance	WHO, MoHSS, MAWLR	541 741	541 741	541 741	541 741	541 741	2 708 705

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 5: Cross-cutting (Food safety, environment, and climate change in the context of One Health)	Goal: To build and promote food safety, and environment and mitigate climate change in the context of One Health	12. To increase awareness on Food safety and environmental protection	12.1 Communication and Advocacy Strategy document developed	Communication and Advocacy Strategy in place Workshops and seminars held nationally, regionally and in the districts to disseminate communication and Advocacy strategy Number of staff members trained Comprehensive assessment of the resources needed, including equipment, personnel, and funding, to enhance the capacity of the National Reference Laboratory Number of AMR reports compiled	0	100%	12.1.1 Developing communication strategy and operationalizing food safety and environmental protection communication and advocacy strategy			150 000				150 000
		13. To Support the development and implementation of food safety standards	13.1 Food safety standards developed and enforced	Number of food safety regulations reviewed/ developed	1	3	13.1.1 Mapping and review of food safety standards	FAO, MoHSS, MAWLR, MEFT, Namibia Bureau of Standards		200 000	200 000	200 000		600 000
		14. To support environmentally friendly agricultural practices	14.1 Research on climate resilient crops conducted	Number of research developed and conducted on crop climate-resilience	0	2	14.1.1 Conduct research on climate-resilient crop varieties 14.1.2 Collaborate with agricultural universities and research institutions	MALWR, Agronomic Board, NGOs/Academia		60 000		60 000		120 000

Thematic Area	Goal	Strategic Objective	Output	Measure/ KPI	Baseline	Targets	Strategic Activities	Accountable	Cost in NAD and timelines 2024 - 2028					
									2024	2025	2026	2027	2028	TOTAL
Thematic Area 5: Cross-cutting (Food safety, environment, and climate change in the context of One Health)	Goal: To build and promote food safety, and environment and mitigate climate change in the context of One Health	15. To reduce greenhouse gas emissions from food production	15.1 To promote and support energy-efficient technologies in food processing, reducing the carbon footprint	Level of Energy Efficiency Index of food processing technologies	TBD	TBD	15.1.1 Upgrade food processing equipment to energy-efficient models	Science and Technology, NCRST, Academia	50 000				50 000	100 000
							15.1.2 Monitor energy consumption and optimize processes							
			15.2 Promote and support the use of renewable energy sources (e.g., solar, wind) in agriculture and food production	Percentage use of renewable energy sources in agriculture and food production	TBD	TBD	15.2.1 Invest in solar panels, wind turbines, and other renewable energy sources	Science and Technology, NGOs	60 000	60 000	60 000			180 000
							15.2.2 Promote energy-saving practices in food production.							
			15.3 Develop strategies to minimize emissions from livestock, considering their contribution to methane and nitrous oxide	Number of strategies for minimising greenhouse emissions developed and adopted	TBD	TBD	15.3.1 Implement livestock management practices to reduce methane emissions (e.g., dietary adjustments)	Farmer Associations, MAWLR, NGOs		80 000	80 000			160 000
							15.3.2 Encourage low-emission technologies (e.g., anaerobic digesters)		60 000				100 000	160 000
												TOTAL		**16 200 545**

5. Conclusion

Integrating One Health in Namibia is essential for safeguarding human, animal, plant and environmental health. By promoting collaboration, strengthening surveillance systems, and adopting a multidisciplinary and multisectoral approach, Namibia can effectively address the complex health challenges it faces. Embracing the principles of One Health will contribute to disease prevention, zoonotic disease control, environmental conservation, food safety, and climate change resilience, and ultimately improving the overall health and wellbeing of the entire population.

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