Food and Agriculture Organization of the United Nations

Yemen Animal Health Strategy and Investment Plan

2024 - 2034

A Comprehensive Approach to Animal Health in Building Resilience

CONTENTS

ACRONYMS AND ABBREVIATIONS

AMR	Antimicrobial Resistance
CAHWs	Community-based Animal Health Workers
COVID-19	Coronavirus disease 2019
CVL	Central Veterinary Laboratory
DAHVQ	Directorate of Animal Health and Veterinary Quarantine
DGAR	Directorate General of Animal Resources
ERRYII	Supporting Resilient Livelihoods and Food Security in Yemen
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot-and-mouth disease
FSRRP	Food Security Response and Resilience Project
GAFSP	Global Agriculture and Food Security Programme
GDAHVQ	General Directorate of Animal Health & Veterinary Quarantine
GDP	Gross domestic product
HoA	Horn of Africa
ICRC	International Committee of the Red Cross
IMF	International Monetary Fund
IP	Investment Plan
IPC	Integrated Food Security Phase Classification
LSD	Lumpy skin disease
M&E	Monitoring and Evaluation
MAI	Ministry of Agriculture and Irrigation
MAIF	Ministry of Agriculture, Irrigation and Fisheries
MENA	Middle East and North Africa
ND	Newcastle Disease
NGOs	Non-governmental organizations
WOAH	World Organisation for Animal Health
per capita PPP	Per capita Purchasing Power Parity
PPR	Peste des petits ruminants
PVS	Performance of Veterinary Services
RVF	Re-emerging rift fever valley
RVF	Rift Valley Fever
SAPREP	Smallholder Agricultural Productivity Restoration and Enhancement Project
SGP	Sheep and Goat Pox
SIDA	Swedish International Development Cooperation Agency
SPS	Sanitary and Phytosanitary Measures
SWOT	Strengths, weaknesses, opportunities, and threats
TADs	Transboundary animal diseases
VTs	Veterinary Technicians
WTO	World Trade Organization
YAHSIP	Yemen Animal Health Strategy and Investment Plan
YVA	Yemen Veterinary Association

LIST OF TABLES

LIST OF FIGURES

FOREWORD

From Fragility to Flourishing: A New Chapter for Yemen's Animal Health

For generations, the sun-scorched plains and rugged mountains of Yemen have echoed with the rhythmic rumble of hooves and the bleating of flocks. Livestock, woven into the tapestry of Yemeni life, have sustained families, powered local economies, and nourished aspirations. Yet, beneath this enduring resilience, lies a harsh reality: a fragmented animal health system struggling to contain infectious diseases, provide crucial veterinary services, and safeguard animal welfare. The consequences are stark – constrained productivity, limited market access, and a constant threat to food security.

The Yemen Animal Health Strategy and Investment Plan (YAHSIP) emerges not just as a blueprint for reform, but as a clarion call for a paradigm shift. It unites the voices of Government officials, veterinarians, farmers, international donors, and the private sector, forging a powerful coalition determined to usher in a new era of animal health in Yemen. This ambitious, yet meticulously crafted, strategy lays out a four-pronged approach to unleash the latent potential of the livestock sector:

1. **Taming the Invisible Foes**: YAHSIP prioritizes the containment of infectious and endemic diseases. Implementing systematic vaccination programs, rigorous health monitoring, and watertight quarantine measures, aligned with the World Organization for Animal Health (WOAH) standards, will create a formidable shield against these invisible foes.

2. **Bridging the Veterinary Divide**: No longer will geographical disparities dictate access to veterinary care. YAHSIP envisions a network of well-equipped veterinary clinics and trained professionals spanning across all Yemeni Governorates, ensuring that even the most remote communities are empowered to safeguard the health and well-being of their livestock.

3. **Championing Compassionate Coexistence**: The YAHSIP recognizes the intrinsic value of animal life. It advocates for humane treatment, eliminating cruelty and exploitation, and fostering a culture of respect for our fellow creatures.

4. **Forging a Wall Against Zoonotic Threats**: Understanding the intricate link between animal and human health, YAHSIP prioritizes robust surveillance and response mechanisms to control zoonotic diseases, safeguarding both livestock and human populations.

Beyond these pillars, YAHSIP stands as a beacon of hope, signifying the birth of the first-ever comprehensive National Animal Health Strategy. This framework will orchestrate a symphony of coordinated development initiatives, fostering:

- Sustainable growth in livestock productivity and production, ensuring a steady flow of nutritious food for the nation.
- Stewardship of the environment and preservation of animal biodiversity for future generations.
- Enhanced biosecurity and protection of farmer livelihoods, ensuring the stability of rural communities.
- Streamlined inter-state collaboration in controlling animal diseases, particularly zoonotic threats, safeguarding regional health security.
- Efficient and transparent regulation of livestock and livestock product imports and exports, empowering Yemeni farmers to compete in the global market.

The YAHSIP is not merely an ambitious plan; it is a potent call to action. It extends a clear roadmap to all stakeholders in the sector, inviting them to contribute their expertise, resources, and commitment. Through collaborative effort, we can transform the Yemeni livestock sector from a fragile fragment into a flourishing engine of resilience, prosperity, and well-being.

Let us embrace the YAHSIP as a shared destiny, not a static document. Let us journey together, driven by a shared vision of a Yemen where the rhythmic rumble of hooves and the bleating of flocks resound not just with tradition, but with the triumphant march of a healthy, productive, and thriving animal health sector.

Dr Hussein Gadain

ACKNOWLEDGEMENT

The Yemen Animal Health Strategy and Investment Plan (YAHSIP) rises like a phoenix from the ashes of resilience, its foundation meticulously crafted by a diverse tapestry of stakeholders. YAHSIP's symphony thrives on the active participation of every stakeholder. We stand in heartfelt appreciation for their unwavering dedication.

We would like to express our sincere gratitude to the Ministry of Agriculture and Irrigation (MAI) and the Ministry of Agriculture, Irrigation and Fisheries Wealth (MAIFW) for their invaluable contributions to the development of the Yemen Animal Health Strategy and Investment Plan. Their dedication and expertise have been instrumental in crafting a comprehensive and forward-thinking roadmap for the improvement of animal health and the livestock sector in Yemen. Specifically, we would like to acknowledge them for:

- Providing their unwavering support and guidance throughout the development process.
- Sharing their deep understanding of the animal health challenges and opportunities in Yemen.
- Engaging in constructive dialogue and actively participating in all stages of the strategy formulation.
- Mobilizing their resources and personnel to ensure the successful completion of the plan.

The MAI and MAIFW's commitment to animal health is truly commendable, and their contributions will have a lasting impact on the lives of farmers and their communities across Yemen. We are confident that the implementation of this Strategy and Investment Plan will have a significant and positive impact on the lives of Yemenis. Improved animal health will lead to increased milk and meat production, providing essential nutrients for vulnerable populations. It will also create jobs and income-generating opportunities, particularly in rural areas, fostering economic development and stability.

We would like to express our sincere gratitude to the World Bank for its invaluable financial support in the development of the Yemen Animal Health Strategy and Investment Plan. The Bank generous contribution has been instrumental in achieving this critical milestone, paving the way for a healthier and more productive livestock sector in Yemen. Through this commitment, we were able to:

- Conduct a comprehensive assessment of the current state of animal health in Yemen, identifying key challenges and opportunities.
- Engage with a wide range of stakeholders, including government officials, animal health professionals, livestock producers, and community representatives, to ensure the Strategy and Investment Plan reflects the needs and priorities of the Yemeni people.
- Develop a robust and evidence-based plan that outlines the necessary investments and interventions to improve animal health, productivity, and market access.
- Lay the foundation for a more sustainable and resilient livestock sector, contributing to increased food security, poverty reduction, and economic growth in Yemen.

We recognize the World Bank's unwavering commitment to supporting the Yemeni people during this challenging time. Your investment in the future of Yemen's livestock sector is a testament to your dedication to sustainable development and the well-being of all. On behalf of the people of Yemen, we thank you once again for your vital contribution.

We extend our heartfelt gratitude to all stakeholders who contributed to the development of the Yemen Animal Health Strategy and Investment Plan. We recognize the invaluable roles played by:

The dedicated farmers of Yemen: You are the backbone of the country's animal sector, nurturing livestock under challenging circumstances. Your insights, knowledge, and resilience have been instrumental in shaping this plan.

Technical experts: Your commitment to ensuring the health and well-being of Yemen's animal population has been a driving force behind this initiative.

Veterinarians, paraprofessionals, and animal health workers: The dedication and expertise of those on the front lines of animal healthcare are crucial for the plan's successful implementation.

Regional and international organizations: Your technical assistance, financial support, and collaboration have been vital in developing a comprehensive and impactful strategy.

Civil society organizations and development partners: Your advocacy and engagement have ensured that the voices of all stakeholders are heard and addressed in the plan.

Research institutions and academics: Your ongoing research and data analysis provide the foundation for evidence-based decision-making in the animal health sector.

Private sector representatives: Your contributions and expertise in areas like animal feed, pharmaceuticals, and animal breeding are essential for a thriving animal sector.

We acknowledge that this plan is a result of collective effort and collaboration. The contributions of each stakeholder, big or small, have combined to create a roadmap for a healthier and more productive animal sector in Yemen. We are confident that, with the continued commitment and dedication of all stakeholders, this plan will bring about positive and lasting change for the animals, farmers, and communities of Yemen.

We thank you all for your vital role in this important endeavor.

Dr Hussein Gadain

1. EXECUTIVE SUMMARY

1. The potential benefits of enhanced animal health and welfare are great for animals, their owners, the society, public health, and the wider rural economy in Yemen. The Yemen Animal Health Strategy and Investment Plan (YAHSIP) has been developed, after extensive consultation with various stakeholders, to answer the call for a new approach to animal health and welfare. The YAHSIP sets out what Yemen wants to achieve over the next decade and provides a clear and strategic direction for how the country will do this.
2. The YAHSIP is a comprehensive framework that outlines the country's approach to improving animal health, mitigating diseases, and enhancing the productivity and welfare of livestock. It was developed in collaboration with various stakeholders including government agencies, veterinary professionals, research institutions, animal industry experts, international organizations, national organizations, and farmers. Government agencies provided valuable insights into policymaking and regulatory framework, ensuring that the strategy aligns with existing legislation and can be effectively implemented at a national level. Veterinary professionals offered their expertise on animal health practices and disease prevention measures, contributing to the formulation of evidence-based strategies. Research institutions brought their scientific knowledge on emerging diseases and technological advancements in diagnostics and treatments, helping to shape a more comprehensive approach to animal health management. Lastly, the inclusion of stakeholders from the animal industry, including farmers ensured that the strategy was practical, taking into account economic realities and the collective well-being of livestock producers. This extensive collaborative effort will ensure that the YAHSIP is responsive to the needs of all parties involved, reflects the country's commitment to achieving sustainable development in the agricultural sector, is comprehensive and effective.
3. The YAHSIP 2024-2034 is organized into eight sections. **Section 1** is the Executive Summary. Section 1 provides an overview of the strategy document, including overarching information on animal health programming, and the linkages with One Health. **Section 2** serves as an introduction to Yemen's economy, providing with understanding of its key features. It delves into the background, highlighting turning points that have shaped its current state. **Section 3** gives the scenario analysis by providing a summary of Yemen's agriculture, economics, livestock industry, and animal health sector. An overview of the approach used to develop the YAHSIP is provided in **Section 4**. The overview covers the YAHSIP's guiding principles, scope, and formulation process as well as how it fits into a larger planning process in the nation. This section's vision outlines Yemen's goals for the next ten years in terms of a sustainable future for animal health. The objectives of the strategy are summed up under five Strategic Priorities, which are covered in **Sections 5 to 7**. Maintaining and enhancing animal health standards is a significant problem.
4. One of the primary objectives of the YAHSIP is to control and prevent the outbreak of animal diseases. By implementing effective surveillance systems, early detection methods, and rapid response mechanisms, Yemen aims to minimize the impact of diseases on livestock and public health. The strategy emphasizes the need for vaccination campaigns to control and prevent outbreaks of priority diseases improved biosecurity measures, and the establishment of disease-free zones to ensure the well-being of animals and reduce the risk of zoonotic diseases. Yemen recognizes the importance of

building the capacity of its veterinary workforce to effectively address animal health challenges. The YAHSIP prioritizes the training and education of veterinarians and other animal health professionals, focusing on areas such as disease diagnosis, treatment, and control. The Government of Yemen aims to foster collaboration with international partners to facilitate knowledge sharing and technology transfer, ensuring the adoption of best practices in animal health management. Enhancing livestock welfare and productivity is another crucial objective of the YAHSIP. This involves promoting good animal husbandry practices, improving nutrition and feed management, and implementing appropriate breeding programmes. By adopting sustainable livestock production systems, Yemen aims to increase productivity, reduce environmental impact, and improve the overall welfare of animals.

5. The Government of Yemen has a distinct role to play, but the effective implementation of the strategy can only be achieved if everybody works together and accepts their respective roles and responsibilities in delivering the vision. The five Strategic Pillars, discussed in **Section 7** are dependent on 23 components or programmes within the YAHSIP. Experts in these 23 areas contributed their thinking to fully develop these components. The success of the YAHSIP is contingent upon two critical elements: governance and infrastructure. These elements are intertwined, as an effective governance framework is necessary to develop and maintain robust infrastructure that can support animal health initiatives. Governance, in the context of animal health, refers to the establishment of policies, regulations, and institutions that govern the sector. It encompasses the coordination of various stakeholders. It is vital to strengthen the institutional framework to ensure the successful implementation of future animal health strategies. While governance sets the foundation for an effective animal health strategy, infrastructure plays a pivotal role in its success. Infrastructure refers to the physical and organizational structures that support animal health activities, including laboratories, veterinary clinics, diagnostic facilities, and transportation networks. In Yemen, the current conflict and economic crisis have severely damaged infrastructure, hindering the delivery of veterinary services and impeding the movement of animals and animal health supplies. By prioritizing these critical elements, Yemen can overcome the challenges it faces and achieve improved animal health outcomes, ultimately contributing to the overall development and well-being of the country.
6. **Section 7** also focuses on the budget for the different strategic Priorities, and consequently their outcomes, which is purely indicative. The budget serves as a guideline or an approximation rather than an exact calculation. This approach allows for flexibility and adaptability, enabling authorities to respond effectively to ever-changing circumstances and emerging challenges related to animal health. By not being strictly bound by fixed figures, decision-makers can allocate resources where they are most urgently needed, or where new developments demand immediate attention. This indicates a proactive stance towards continuous improvement and innovation within animal healthcare systems.
7. While the indicative budget provides invaluable guidance, it is imperative for stakeholders involved in the YAHSIP to ensure transparent reporting mechanisms, proper monitoring, and evaluation procedures to guarantee effective implementation of funds towards achieving optimal outcomes and adequately addressing priorities within this critical field. **Section 8**, explains how the YAHSIP will be communicated, measured, and managed. Indicators will be developed with stakeholders and animal owners to measure the strategy's progress towards its objectives. A Steering Board made up of the Government and stakeholders and taking input from a Technical Group, will provide strategic guidance

on the priorities, communication, and development of the strategy. Conferences will be held to communicate progress and inform priorities. The delivery of the YAHSIP developed in a separate **Implementation Plan** annexed. This will be updated annually to show progress under the YAHSIP.

2. INTRODUCTION

2.1. The Economy of Yemen

8. Yemen has been in conflict since 2015 with peace hindered by continued violence. The conflict has had a devastating impact on civilian life, public institutions, and infrastructure. The national economy has collapsed and with it the purchasing power of consumers. Import and export have been reduced to just a trickle of earlier volumes. Despite these ordeals, most businesses have survived, occasionally even thrived, showing the extraordinary capacity of Yemenis to adapt to hardship and bounce back from setbacks. Initiatives and projects have been conducted to highlight the efforts being made to support Yemeni businesses and build resilience in the face of adversity (Harvard Business Review, 2022; World Bank, 2022; UNDP, 2023). They provide opportunities for economic growth, job creation, and the development of local communities.
9. Yemen's rural areas are inhabited by nearly 70% of the population. The GDP per capita (purchasing power parity) in 2018 was estimated at 2285 USD (Trading Economics, 2023). This represents a record low for Yemen's GDP per capita PPP, which has been decreasing over the years. The GDP per capita PPP in Yemen averaged 3745.04 USD from 1990 until 2018, reaching an all-time high of 4566.20 USD in 2010 (Trading Economics, 2023). Other sources such as the IMF Data Mapper and IndexMundi provide similar estimates for Yemen's GDP per capita PPP, with values ranging from 2,000 to 3,200 international dollars in recent years (Indexmundi, 2023; World Economic Outlook, 2023).

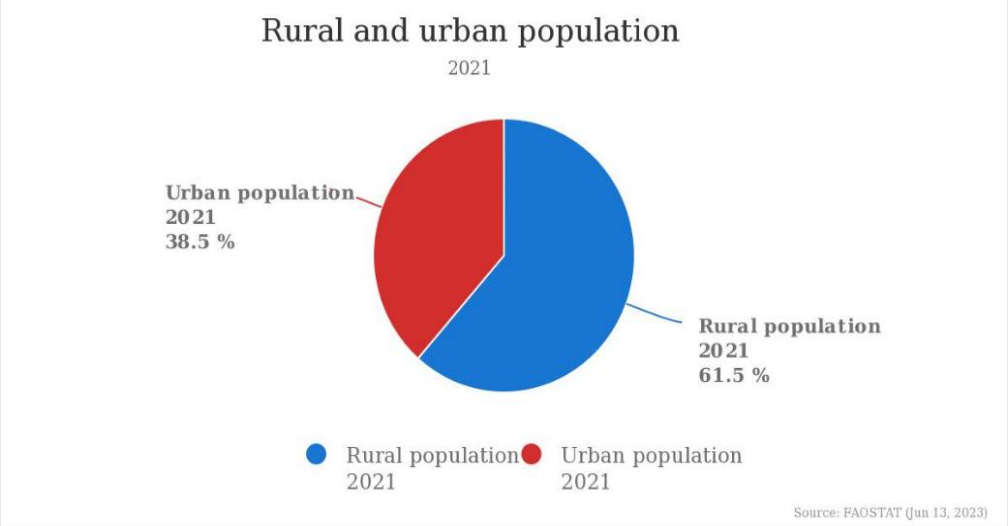

Figure 1: Share of the urban and rural population in Yemen (2021)

Source: FAOSTAT, 2023.

10. The conflict remains the main driver of acute food insecurity, malnutrition, and overall socio-economic condition. It continues to impact development needs and there are significant challenges facing the Government of Yemen (Worldometer, 2016; UNICEF, 2022; EIA, 2023). An IPC analysis conducted from October to December 2020 estimated that 13.5 million people were highly food insecure (IPC Phase 3

and above) (IPC, 2021). This analysis also estimated that the number of highly food-insecure people would increase to 16.2 million between January and June 2021, even if humanitarian food assistance was maintained at the current level (UN News, 2023). Inflation, currency depreciation, and rising global commodity prices have adversely affected external balances, inflation, and international reserve levels (World Bank, 2022a). Now in its eighth year, the conflict continues to disrupt livelihoods, reduce incomes, and seriously hinder the country's economy.

11. In 2020, the COVID-19 pandemic further exacerbated the ongoing crisis, particularly in terms of food security and healthcare, exhausting the coping capacities of rural households and dramatically increasing humanitarian needs. Most households resorted to crisis-level coping strategies to meet their immediate food and cash needs. The most commonly adopted strategies included borrowing money or buying food on credit; reducing essential non-food expenditures; and reducing expenditures on agricultural, livestock or fisheries inputs (Human Rights Watch, 2020). Soaring food prices, exacerbated by the war in Ukraine, have also had a major impact on Yemen's economy and worsened the food crisis.
12. Yemen is a prominent center for trade, connecting Africa, Asia, and Europe. This historical significance has shaped the economic trajectory, paving the way for subsequent developments. The economy is heavily dependent on oil exports, which account for a significant portion of the country's government revenue and exports (Wikipedia, 2018; EIA, 2023); Worldometer, 2016; OEC, 2021; OEC, 2021a). It accounted for 87% of exports in 2005 and 92% of overall exports in 2004. (Wikipedia, 2018). Income from oil production constitutes 70% to 75% of government revenue and about 90% of exports (Wikipedia, 2018; OEC, 2021a). The offshore oil and gas deposits are estimated to contain billions of barrels of oil and gas (Wikipedia, 2018). The economic condition has gotten worse since oil shipments have stopped, which has already been impacted by the ongoing conflict, the COVID-19 pandemic, trade disruptions, the acute fuel supply shortages, and the scaled-back humanitarian efforts (Worldometer, 2016; EIA, 2023).

2.2. The Agricultural Sector in Yemen

13. Agriculture is a vital sector in the Yemeni economy and is the main source of employment. According to information on the economy, it is estimated that since 1990, agriculture has contributed more than 20% of the gross domestic product (GDP), reaching 20.4% in 2005 (Wikipedia, 2018). Around 50% of the labor force is employed in the agricultural sector, and approximately 70% of the population relies on income from agricultural activities (Center for Strategic Studies, 2018; Yemen Policy Center, 2021). More than half of the population earns a living from agriculture, which is a significant economic pillar in the nation. Agriculture-based livelihoods have been severely impacted by the humanitarian crisis, with the production of livestock and cereals falling sharply from pre-crisis levels (FAO, 2017).

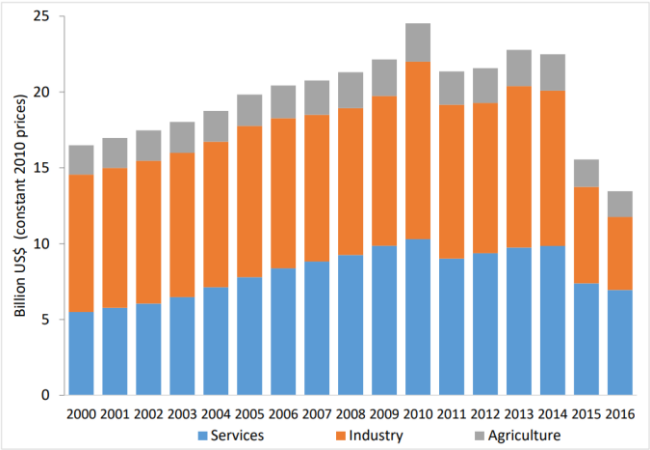

Figure 2: Overview of the severely affected Yemen's economy, including the agricultural sector (2000 to 2016)

Source: World Bank, 2018

14. The surface of cultivated land in Yemen is estimated to be around 1.5 million hectares, which is about 2.91% of the total land area. Estimates in 2018 record that agricultural land represented 44.5%, arable land 2.2%, permanent crops 0.6% and permanent pasture 41.7%. However, not all of this land is used for food production, as an increasing percentage of land is converted to cultivation of qat, a stimulant plant that is widely consumed in Yemen. Only about 0.6% of the land is planted with permanent crops, such as fruits and nuts. About 6,801 square kilometers of the land is irrigated, mainly by spate water from seasonal floods and springs (USAID, n.d.; CIA World Factbook, 2021). Common crops include millet, corn (maize), wheat, barley, and sorghum; myriad vegetables; average farm size is a mere 1.1 hectares. Like many developing countries, Yemen suffers inordinately from the detrimental effects of climate change; communities face recurring cycles of destructive droughts and flooding. This further undermines soil fertility and leads to soil erosion. Smallholder subsistence farming households suffer the most, stretched to their resiliency and coping limits as a result.
15. Yemen's agricultural sector faces a myriad of challenges that hinder its full potential. The dominant issues are low productivity, severe resource constraints, inadequate marketing systems, low human resources capacity, lack of infrastructure facilities and production technologies, limited access to modern farming technologies, a lack of research and development investment, and an insufficient supply of inputs. Post-harvest losses due to poor handling, packaging and transport are estimated to affect about 20-30% of crop output (Organic Yemen, n.d.). The country's arid climate and limited water resources also pose a significant constraint on agricultural productivity. Irrigation systems are inefficient, resulting in significant waste of water, estimated to be in the range of 50% to 65%. The water scarcity is exacerbated by mismanagement, over-extraction, and reliance on traditional irrigation methods (The Century Foundation, 2020). Despite the challenges, the agricultural sector has significant potential for growth and diversification. The unique agro-climatic conditions offer opportunities for the cultivation of high-value crops, such as coffee, qat (a stimulant plant), fruits, vegetables, medicinal herbs and spices and production of honey, which could be leveraged to increase exports and boost the economy.

2.3 The Livestock Sector in Yemen

16. Livestock is one of the main agricultural subsectors in Yemen and is considered the main key to fighting poverty and improving food security. Livestock comes second to crops in their contribution to agricultural GDP and forms a critical part of the agricultural sector and the economy. The livestock industry is concentrated in populated high and low-land regions, while the poultry industry is almost totally located in the coastal low-lands. The industry demands natural grazing and agricultural crops, and feed supplements especially during the dry season, while the poultry industry demands significant amounts of non-wheat products such as corn and soybean meal that may be imported by traders to cover the immediate needs (Zohair G. A., 2010).
17. The livestock mainly comprises of cattle, sheep, goats, horses, donkeys, camels, and poultry. The protracted conflict and climate factors have negatively affected the livestock population growth. The last Livestock Census was done in 2002. There is a need for a comprehensive livestock population survey to determine updated and more accurate figures for production and health programming.
18. In 2021, The Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) estimated the livestock population to be at 9,256,539 head of sheep; 9,343,908 head of goats; 1,661,997 head of cattle; 453,296 head of camels; and 71,621,000 head of Chickens. The livestock population is predicted to increase by around 3% per year to reach 30 million by 2025 (Arab National Development Planning Portal n.d).

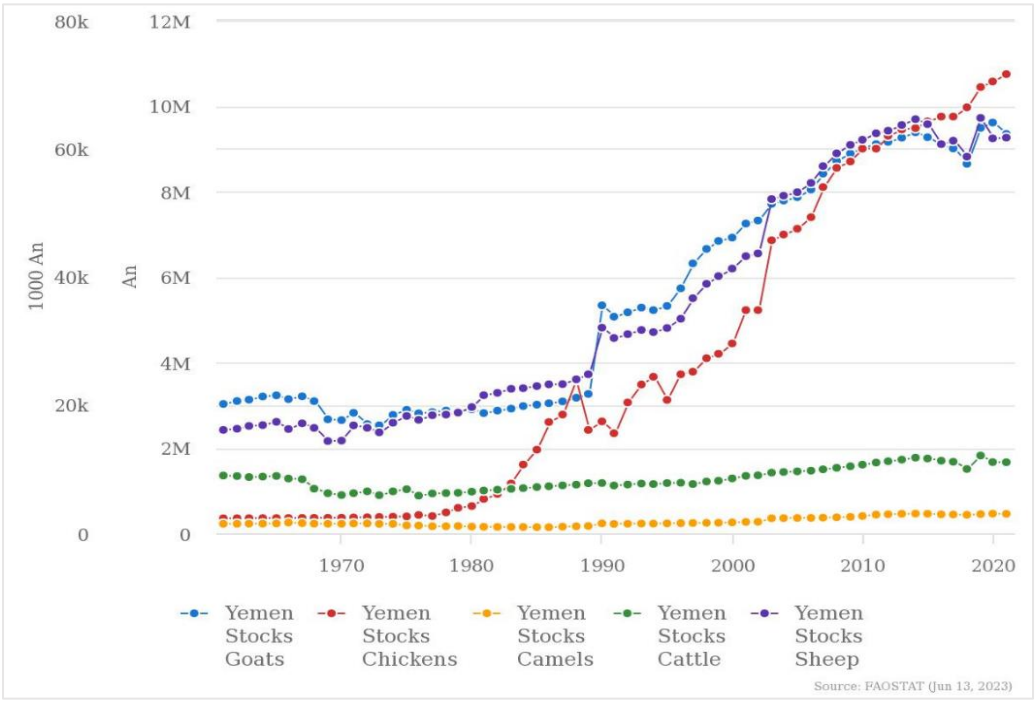

Figure 3: Trend in the evolution of the livestock population in Yemen (1960 to 2020)

Source: FAOSTAT, 2023

19. Yemen has five agro-climatic zones for agriculture purposes. The climatic conditions vary greatly across the country with rainfall varying from 50 mm in the coastal lowlands to 1200 mm in the southern upland (GDAHVQ Annual Report, 2019). According to the five agro-climate zones the animal population are distributed as following:

    - Eastern zone 33.75% of the total livestock population and 3.7% of the cattle population.
    - Coastal lowland 15.4% of the total livestock population and 25.1% of the cattle population.
    - Central highland 10% of the total livestock population and 12.4% of the cattle population.
    - Northern highlands 24% of the total livestock population and 25.4% of the cattle population.
    - Southern uplands 17% of the total livestock population and 33.4% of the cattle population.

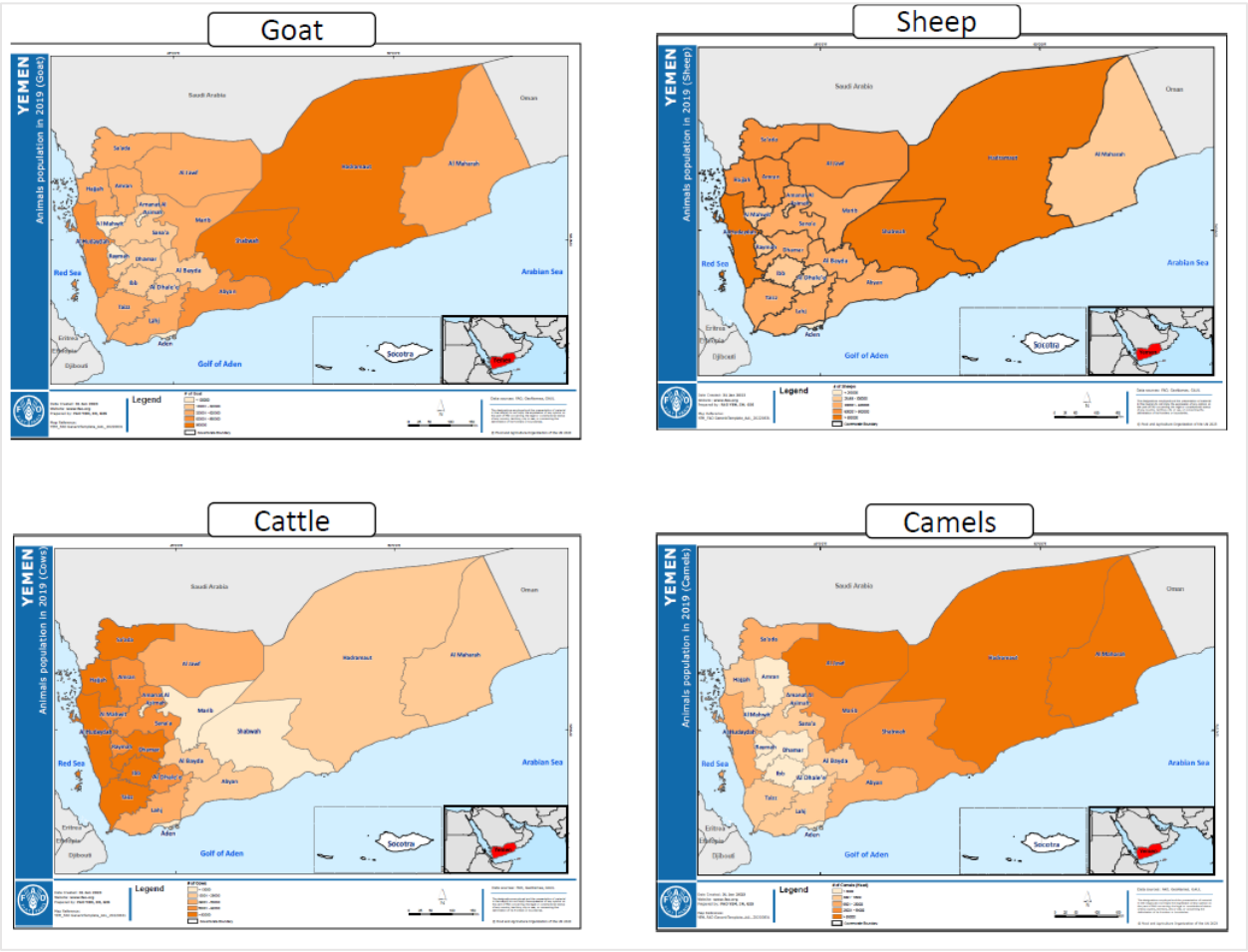

Figure 4: Map showing the distribution of livestock according to the five agro-climatic zones.

Source: GDAHVQ Annual Report, 2019

20. Hodeidah, Hajja, Ibb, Dhamar, Taiz (Figure 6 below), have sizeable cattle populations, while mountainous areas like Taiz and Saada have their own unique breeds adapted to their specific environments. Cattle are mostly indigenous breeds, which are raised by small-scale farmers using traditional methods. The animals are usually kept for meat, milk, and hides, and they are also used for

transportation and plowing. The low level of animal husbandry practices and inadequate grazing areas have led to low productivity, poor animal health, and a limited supply of high-quality beef.

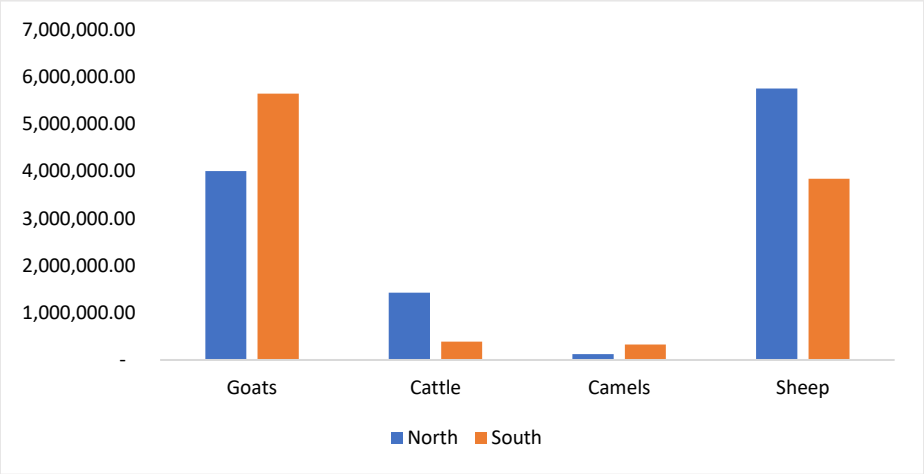

Figure 5: Distribution of the livestock population in the regions of Yemen (2019)

Source: GDAHVQ Annual Report, 2019

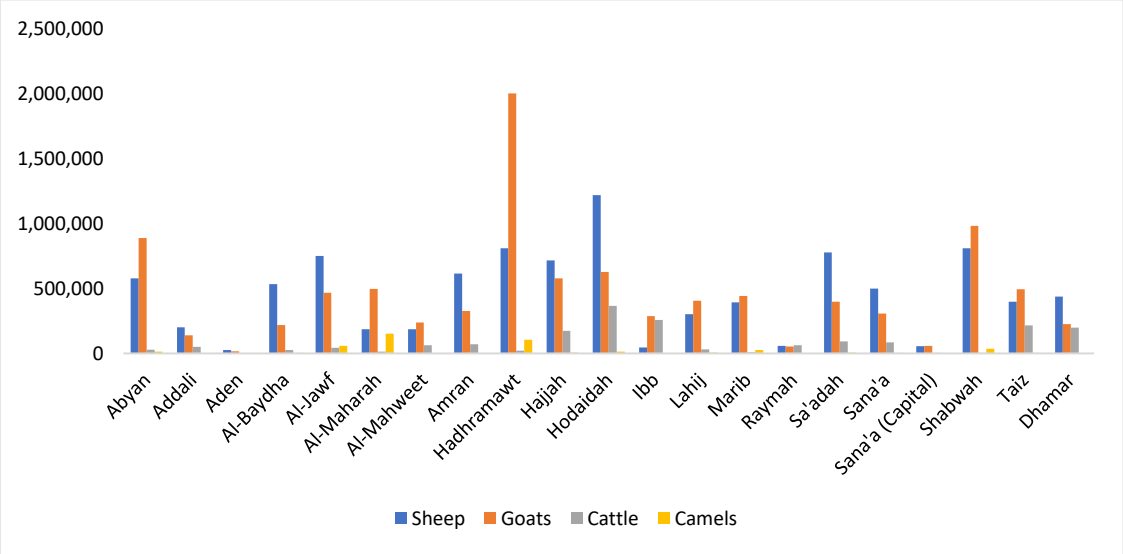

Figure 6: Distribution of the livestock population in the different Governorates in Yemen (2019)

Source: GDAHVQ Annual Report, 2019

21. The dairy industry plays a crucial role in the agricultural sector and the economy. With a rich tradition of dairy farming and a diverse range of dairy products, Yemen has long been recognized as an important player in the regional dairy market (USAID-KAVES, 2017). The Yemeni Zebu and Tihama breeds have adapted to the local environment and possess traits such as heat tolerance and resistance to diseases commonly found. Given the challenging agro-climatic conditions and limited natural resources, feed and nutrition management play a crucial role in the productivity of dairy cattle.

Farmers employ a variety of strategies, including utilizing locally available forage, crop residues, and supplementary feed, to ensure the nutritional needs of their animals are met.

22. Goats are predominantly raised for meat, but they also serve as a source of milk and skins (IndeBox, 2023). Yemen is home to a diverse array of goat breeds, each with unique characteristics that make them ideal for different purposes. The diverse topography and climate greatly influence the distribution of sheep and goats. The coastal areas, with their humid and hot climate, are less suitable for extensive livestock farming. The highlands and the desert regions provide ideal conditions for grazing, resulting in a higher concentration of sheep and goats in these areas. Sheep also are an essential part of the economy, and they play a crucial role in providing income and livelihoods to many people. Sheep are in high demand across the Middle East, and they are sold at premium prices. This has provided a much-needed boost to the economy, and it has helped to create jobs and stimulate growth.
23. The poultry industry also significantly contributes to the agricultural sector (around 3%) and to the overall economy (around 0.5%). The industry has grown significantly in recent years, generating revenue of more than $1.5 billion USD (Jamil Abdo Saeed and Al – Mamari, 2008). The poultry sector is considered as one of the biggest investments in the country and the main investment in the field of livestock. The average annual growth rate in the poultry production has been about 7% caused by increasing demand for poultry meat. However, the industry also faces many challenges, such as the impact of COVID-19, transboundary animal diseases, lack of infrastructure and services, and political instability (UNDP, 2020; WM-strategy, 2023). The forecast for the industry development in the medium term is uncertain and depends on various factors. Yemen is experiencing a protracted conflict that has resulted in widespread displacement, food insecurity, malnutrition, and economic collapse. The poultry industry has been severely affected by the destruction of infrastructure, disruption of markets, shortage of inputs, and increased insecurity. The conflict also poses a threat to animal health and biosecurity, as outbreaks of diseases such as avian influenza and Newcastle disease have been reported (UNDP, 2020). The coronavirus (COVID-19) pandemic has impacted the demand and supply of poultry products, as well as the prices and incomes of the actors involved. The pandemic has also affected the availability and accessibility of veterinary services, feed, vaccines, and other inputs. The pandemic has highlighted the need for strengthening the resilience and sustainability of the poultry value chain, as well as enhancing the coordination and collaboration among the stakeholders (UNDP, 2020).
24. Yemen has a high demand for poultry products, especially chicken meat and eggs, which are considered as affordable sources of protein and essential nutrients (UNDP, 2020; Reportlinker, n.d). The domestic production of poultry products is unable to meet the demand, resulting in a large gap that is filled by imports from neighboring countries. The market opportunities for the poultry industry are therefore significant, especially if the quality, safety, and competitiveness of the domestic products can be improved (Reportlinker, n.d). The consumer preferences for poultry products may also change over time, influenced by factors such as income, education, culture, religion, health awareness, and social norms. The market opportunities and consumer preferences require innovation and diversification to meet the needs and expectations of the consumers (Reportlinker, n.d).

25. In 2021, there were 20,512 active farms and sheds. Except for a few farms in the northern highlands of Amran, parts of Hajjah, Sana'a, and Sa'dah Governorates, virtually all commercial poultry farms are situated along a north-south zone across the highlands, beginning in the southern uplands of Taiz and Ibb Governorates. The majority of Poultry-stock farms are found in the central highlands of Ibb (Ya-rim), Albayeda, Dhamar, and Sana'a. The majority of the 15 hatcheries are situated in the Tihamah Zone's humid, hotter coastal lowlands, where the climate is ideal for hatching (Jamil Abdo Saeed Al and Mamari, 2008; Zohair, 2010; GAIN Report, 2011).
26. Camels are also well adapted to the arid and semi-arid conditions of Yemen and can survive on low-quality feed and water resources. Camels are an important part of the agricultural sector in Yemen, as they provide food, transport, power, and manure. camels contribute to about 12% of the total livestock production value in Yemen (FAO, n.d.). However, camels are not a major source of economic revenue for Yemen, as they are mostly used for subsistence purposes by rural households. The export of camels and camel products is very limited, due to the lack of adequate infrastructure, marketing, and quality standards. Camels face many challenges such as diseases, parasites, conflicts, droughts, and insecurity.

2.4 Opportunities for increased livestock production and trade

27. Yemen's unique geographical location provides it with a distinct advantage for livestock production and trade. Situated at the southern end of the Arabian Peninsula, the country benefits from a diverse range of natural resources and topographical features that make it ideal for raising livestock and facilitating trade. Yemen's strategic location also positions it as a crossroads between Africa, Asia, and Europe. This advantageous position enables easy transit routes for livestock trade with neighboring countries in both directions. It has historically played an essential role in international trade through its harbors such as Aden and Mukalla, providing favorable conditions for exporting domestically produced livestock products like dairy items or meat to global markets (FAO, 2023b).
28. In 2019, major imports partners for Yemen in animals were Brazil, Saudi Arabia, Somalia, New Zealand and Denmark.

Table 1: Yemen animal exports, imports, tariffs by country and regions in US$ thousand 2019

Partner Name	Import (US$ Thousand)	Import Product Share (%)
Brazil	34401.35	15.59
Denmark	11462.56	85.79
New Zealand	12385.28	98.67
Saudi Arabia	22685.53	7.45
Somalia	16494.41	99.53
World	148016.8	3.14
East Asia & Pacific	14809.65	1.53
Europe & Central Asia	32690.37	4.86
Latin America & Caribbean	35947.14	7.54
Middle East & North Africa	38443.44	2.03
North America	80.17	0.05
South Asia	275.8	0.15
Sub-Saharan Africa	16968.46	35.58

Sources: The World Integrated Trade Solution (WITS).
https://wits.worldbank.org/CountryProfile/en/Country/YEM/Year/2019/TradeFlow/EXPIMP/Partner/All/Product/01-05_Animal#

Beef

29. Yemen has witnessed a steady decline in the number of livestock due to land degradation, conflict, and drought, making it difficult for the country to meet its rising demand for meat products. The government has played a critical role in regulating beef imports and exports by imposing tariffs and import restrictions on beef imports. These measures are aimed at supporting the domestic beef industry by encouraging local production and minimizing the country's reliance on imported beef. Yemen was self-sufficient in meat production, but over the past few decades, the country's growing population and escalating food needs have led to a surge in beef imports (FAO, 2023b). It has been forced to rely on beef imports to help close the demand and supply gap. According to the Global Agricultural Information Network (GAIN) report, Yemen's beef imports were estimated at around 39,000 metric tons in 2018, with Brazil, India, Australia, and Sudan being the primary suppliers of beef to the country. These countries account for approximately 69% of all beef imports into Yemen.
30. The shift towards beef imports has led to increased competition among importers, with companies sourcing their beef products from different countries. For instance, the report by Global Alliance for Improve Nutrition (GAIN) indicates that in 2018, Yemen imported beef from 21 countries, with Brazil being the largest supplier, providing over 30% of the beef imports. The surge in beef imports is partly attributed to the increasing demand for meat products and the declining livestock sector in the country. In February 2020, the government imposed a ban on all beef imports from Somalia, citing the need to prevent the spread of livestock diseases. According to the data from the USDA ERS (USDA ERS), Yemen imported 1,000 metric tons of beef and veal in 2019, with a value of $3.8 million. Yemen exported 0 metric tons of beef and veal in 2019, with a value of $0. The main sources of beef and veal imports for Yemen were Brazil (68%), India (18%), and Australia (14%). Yemen did not export any beef and veal to any country in 2019. The pandemic-related disruptions led to a rise in the price of beef imports into Yemen, which hit a record high of $7.33 per kilogram in April 2021.
31. The beef export market is in its early stages, and the country has yet to establish itself as a leading beef exporter. The industry has shown growth potential in recent years. The export volume and revenue have increased steadily over the years. In 2020, the country exported approximately 2,500 tons of beef, generating revenue of about $10 million. Saudi Arabia is the top beef export destination, accounting for more than half of the total beef exports. Other major destinations include the United Arab Emirates, Oman, and Bahrain. These countries prefer fresh, high-quality beef products.

Poultry

32. The poultry industry is a significant contributor to Yemen's national economy, with an estimated annual production of approximately 135,000 metric tons of poultry meat and over 1 billion eggs. The industry primarily operates through small-scale family-owned farms that produce a range of poultry products, including chicken, turkey, and quail. The sector employs around 200,000 people across the country, with a majority of the workforce coming from rural areas. After gaining independence, Yemen began implementing trade policies aimed at promoting its domestic industries, including the poultry industry. Since 1967, The country- imposed tariffs and non-tariff barriers on imported poultry products

to protect local producers. This move led to an increase in local production and a decline in imports. However, the protectionist policies also had some negative outcomes. The poultry industry faced challenges in accessing international markets, which slowed its growth. High tariffs and non-tariff barriers also led to higher prices for consumers, particularly those on lower incomes. The country imports a significant amount of poultry products from other countries, including Saudi Arabia, Oman, and other countries in the Middle East. The main reason for this is the insufficient local production of poultry products in Yemen. Yemen imports almost 60% of the total poultry products that are consumed in the country (GAIN Report, 2011).

33. The domestic poultry market in Yemen is relatively large and has seen steady growth over the years. In 2015, exports of poultry from Yemen declined sharply to 31 tons, reducing by -45.4% on 2014 figures. According to ReportLinker (2023), Yemen's poultry production is set to increase by 1.7% each year over the next five years, reaching around 219,000 metric tons in 2026, up from 198,000 metric tons in 2021. The market is segmented into three categories, namely, broiler meat, layer meat, and eggs. Poultry exports from Yemen are very low. The country produces a small number of poultry products that are not enough to fulfill the local demand, let alone to export. However, there is a great potential for the country to export poultry products, given its strategic location and the availability of cheap labor. According to the data from knoema.com, Yemen imported 148,284 tonnes of poultry meat in 2021, worth 258,368 thousand US dollars (Knoema n.d). This was an increase from 2020, when Yemen imported 125,000 tonnes of poultry meat, worth 200,000 thousand US dollars (Knoema n.d). The main sources of poultry meat imports for Yemen are Brazil, Saudi Arabia, and Turkey (OEC, 2021). Yemen exported no poultry meat in 2021, as well as in 2020 (Knoema n.d). Yemen has a very low level of poultry meat production, and most of it is consumed domestically (OEC, 2021a). The last time Yemen exported any poultry meat was in 2017, when it exported 4 tonnes, worth 8 thousand US dollars (Knoema n.d). The destination of this export was unknown (OEC, 2021a).

Sheep and Goat

34. According to the data from the Observatory of Economic Complexity (USDA ERS; National Agricultural Statistics Service), Yemen imported $1.01M worth of sheep and goat meat in 2021, which was 0.01% of the world's total imports of this product. The main sources of sheep and goat meat imports for Yemen were Oman ($0.97M), Saudi Arabia ($0.03M), and Ethiopia ($0.01M). Yemen exported $2.06M worth of sheep and goat meat in 2021, which was 0.02% of the world's total exports of this product. The main destinations of sheep and goat meat exports from Yemen were Saudi Arabia ($1.98M), Oman ($0.06M), and Qatar ($0.02M). Yemen also imported $3.83M worth of live sheep and goats in 2021, which was 0.19% of the world's total imports of this product. The main sources of live sheep and goats' imports for Yemen were Somalia ($3.82M) and Ethiopia ($0.01M). Yemen exported $2.64M worth of live sheep and goats in 2021, which was 0.13% of the world's total exports of this product. The main destinations of live sheep and goats' exports from Yemen were Saudi Arabia ($2.64M) (USDA ERS; National Agricultural Statistics Service).
35. Today, the livestock market in Yemen is completely fragmented with no formal or organized marketing structure. Lack of access to vet services, poor breeding practices, poor nutrition, contamination of feed and water, and parasites and disease are so rampant and unchecked that it not only affects

livestock but also children and adults who tend to their animals. With an upgrade of veterinary services, increased productivity and a structured value chain, this sector could contribute even more to the diversification of poor rural households‟ income and to import substitution at the national level.

36. Yemen is one of the main importers of livestock from the Horn of Africa (HoA). Twenty-five (25%) to 40% of the total meat production consumed annually is imported. Yemen has a unique geographical position in the Arabian Peninsula as it is situated only at a short distance from the HoA. It has a long history of animal trade and human movement with the HoA as well as a crossroad for animal trade for the Arabian Peninsula and Gulf countries that also increases the risk of introducing new diseases to the region, especially with the weakness of the veterinary services and quarantines (FAO, 2023b).
37. Yemen is in a critical situation, particularly with respect to the possible entry of animal pests and diseases, due to its geographical location at the crossroads of Africa (which provide most of the imported animals) and the Arabian Peninsula, as well as with the wild birds migrating from north to south and back (FAO, 2023b). Many of the diseases have the ability to influence and affect human beings, whether in the form of epidemics or repeated chronic attacks (brucellosis, tuberculosis …). Some of the diseases are transmitted through food and through the consumption of contaminated animal products, all of this cause many human deaths and high rates of morbidity in different regions of the country. The critical situation also is related to the deterioration of genetic resources and poor animal care, nutrition, breeding and genetic improvement programs. Most of animals are imported from Africa. It is assumed that Africa is home to most of the animal epidemics that constitute a major threat to domestic livestock and public health in the event of leakage to Yemen.

3. SITUATION ANALYSIS

3.1 Policy, Strategy, and Institutional gap analysis

38. The Yemeni government has undertaken various policies with the explicit purpose of supporting the livestock sector, recognizing its crucial role in the nation’s economy and food security. These policies encompass a broad range of measures, including financial support, training programs, and infrastructure development. Financially, the government has allocated significant funds to provide subsidies and loans to livestock farmers, enabling them to invest in modern technologies and equipment. These financial incentives not only strengthen the sector’s competitiveness but also alleviate the financial burden on farmers, ultimately promoting sustainable growth.
39. The government has implemented comprehensive training programs aimed at enhancing the skills and knowledge of livestock farmers. Through these programs, farmers acquire the necessary expertise to employ advanced agricultural practices, such as disease prevention measures and efficient breeding methods. The government has prioritized infrastructure development in rural areas to support the livestock sector. This includes the construction and maintenance of veterinary clinics, animal shelters, and feed storage facilities, ensuring that farmers have access to essential resources and services. Primary and secondary sources of evidence consistently attest to the positive impact of these policies on the sector, showcasing increased productivity, improved animal health conditions, and enhanced market competitiveness.

40. The strategy highlights more identified areas of improvement needed to improve the existing policies. By conducting a thorough assessment and analysis of the current policies, the strategy has pinpointed specific deficiencies that require immediate attention and action. It recognizes that in order to enhance overall effectiveness, it is imperative to address these weaknesses adequately. The identified areas encompass various aspects such as policy enforcement, clarity of guidelines, response mechanisms, and stakeholder engagement.

3.1.1 Strategy Gap Analysis

41. The Yemeni government has recognized the importance of the livestock sector and has implemented policies to support its development. The goals of these policies are to increase livestock productivity, improve animal health, and create job opportunities. These policies also aim to reduce poverty levels in rural areas and improve food security by increasing the supply of animal products. The policies have included the construction of veterinary clinics, the implementation of vaccination programs, and the provision of credit and financial support to farmers. However, the sector has faced significant challenges in recent years due to conflict and political instability, which have hindered the implementation of these policies. The government has also initiated programs to improve the infrastructure and technology available to farmers in rural areas. The effectiveness of these policies remains limited. There is a need for a strategic review of these policies to accompany the major investments in the animal health sector development. This calls for an analysis of the different management options in order to direct investment to the most productive uses in animal health. MAI and MAIF and their partners shall conduct detailed livestock value chain analyses and develop Animal Health and Livestock Development Strategy to shape priorities and future of the Yemeni livestock sector in the years to come.
42. **An enhanced livestock sub-sector strategy is needed to address key constraints to livestock productivity**. The conflict has made it challenging to access veterinary services and animal feed, leading to increased mortality rates among livestock. Many farmers have been forced to abandon their farms due to insecurity, leading to a decline in production and increased poverty levels. The arid and semi-arid climate of Yemen also poses a significant challenge to the livestock sector. The scarcity of water and grazing areas limits the available resources to feed and water the animals, leading to low productivity. The climate is conducive to the spread of diseases such as Foot-and-Mouth Disease (FMD), and Peste des Petits Ruminants (PPR) which poses a significant risk to the health of livestock and economic values. Livestock feed shortages are crucial in both the highlands, where grazing land is becoming extremely scarce, and in the lowlands due to rangeland degradation. There is no private sector participation in the production of compound feeds. Drought reserves of feed and forage need to be developed as a means of disaster risk preparedness. Artificial breeding methods also need to be considered for genetic upgrading, particularly of cattle, and traditional apiculture methods could be improved.
43. **A strategy is needed to address investments in animal health services**. The focus on primary production has tended to overlook the importance of Investments in animal health services. The effectiveness of the policies and the impact they have had on the sector are not clear. The government's ability to provide financial support to farmers has been impacted by the economic crisis,

further reducing the impact of these policies on the sector's development. The government's focus on other sectors, such as oil and gas, has resulted in limited funding for the livestock sector. Investments in animal health services and infrastructure have been insufficient, leading to low productivity and a lack of market access for livestock products. Yemen's policies towards the livestock sector are less comprehensive and less well-supported. Neighboring countries such as Saudi Arabia and Oman have invested heavily in the development of their livestock sectors, with a focus on improving animal health services and breeding programs. Access to finance and credit has been limited for small-scale farmers and pastoralists in Yemen. The lack of access to capital has hindered investment in animal health services, breeding programs, and market access, restricting the growth of the sector.

44. **Value chain efficiency improvement is needed**. The lack of government support has reduced the productivity and profitability of the livestock sector. Limited access to markets, low-quality infrastructure, and a lack of investment in animal health services have hindered the growth of the sector, resulting in reduced incomes for small-scale farmers and pastoralists. The lack of investment in animal health services and infrastructure has also had negative environmental impacts. The spread of diseases, such as Rift Valley fever and foot-and-mouth disease, has reduced animal productivity and increased the risk of zoonotic diseases. Poor infrastructure, such as inadequate water supply and grazing land, has also led to overgrazing and land degradation.
45. **A strategy for conservation and utilization of animal climate and disease resistant breeds**. Numerous breeds in Yemen have been genetically selected to cope better with the harsh environmental conditions and infectious diseases found in the different parts of the country. These breeds can help to improve animal health, welfare, and productivity, as well as reduce the negative impacts of livestock production on the environment and human health. Possible advantages of investing in such selection programmes will produce livestock that are more tolerant to heat, drought and that are more efficient in feed conversion or digestion that reduce the emission of greenhouse gases contributing to climate change. It will also produce livestock that are more resistant to diseases or parasites as well as the use of antibiotics or other drugs that can have negative side effects. Livestock that are more immune to infectious agents, such as viruses and bacteria can prevent the spread and outbreak of diseases that can affect animal health and productivity, as well as pose a risk to human health through zoonosis. Livestock that are more genetically diverse can also increase the resilience and robustness of animal populations to cope with emerging or evolving pathogens.

3.1.2 Institutional Gap Analysis

46. **There are systemic capacity limitations at all levels and in all the sectoral institutions.** In comparison to 2014, when the last Performance of Veterinary Services (PVS) was conducted, the institutional capacity has significantly decreased. The findings of the institutional capacity assessments conducted by FAO in July 2023, revealed that Yemen's livestock institutions and authorities all have a limited capacity in terms of human resources, working premises, equipment, communications, machinery, furniture, and financial resources (*FAO, 2023b*). The main factor for this downward trend is the protracted large-scale conflict that erupted in the country in early 2015. The conflict has resulted in a series of negative effects that have not only slowed down the development of the livestock

institutions' capacity, but also destroyed any capabilities or enablers that already existed. The subsequent impacts include, but are not limited to, the complete shutdown of government work and services, the cessation of government budgets that facilitate the functioning and operation of the institutions, the migration and retirement of the core technical staff and experts, and the destruction and/or deterioration of all livestock infrastructure and facilities. In the same way as other public institutions in Yemen, all these factors led to the paralysis of livestock institutions and authorities, thereby aggravating already existing capacity gaps and weaknesses, their ability to provide field presence, infrastructure, and people. Because of this, no organization or authority has the ability to carry out its authorized duties or provide the necessary services.

47. **Policies and strategies (although with some gaps) exist but are not implemented efficiently and effectively.** Most of this is attributed to institutional capacity weaknesses. Specifically, it concerns how the livestock development activities are organized from the technical and budgetary perspectives, as well as how the available human, financial and physical resources are used. The core livestock institutions in the country are still far from being independent and capable of carrying out their functions without any outside financial, technical, or operational assistance. The assessment concluded that, due to the limited financial and field presence of both Directorate Generals (DGAHVQ and DGARD), neither can provide the required veterinary and extension services without external funding. While both Directorate Generals have varying capacity levels, they do not possess the technical expertise necessary to effectively undertake the activities, interventions, and responsibilities they are mandated for (*FAO, 2023b*).

48. The assessment advises that **important and strategic initiatives be given top priority and immediate funding in order to restore livestock institutions' and authorities' capacity and resume offering veterinary and extension services.** The National Livestock Research Institute has not yet been operationalized, whereas the Directorate of Animal Health and Veterinary Quarantine (DGAHVQ) and the Directorate General of Animal Resources Development (DGARD) are currently two of the three primary livestock institutions working in various roles (*FAO, 2023b*). The DGAHVQ has limited staff but with a defined mission, a controllable structure, a sizable workforce, and a prospective capacity for growth. DGARD, on the other hand, was recognized in the assessment to have been revived but is no longer able to offer any services or activities. Other than the four directors, the department lacks a proper hierarchy and has no technical or ground employees. This has had an effect on the country's livestock value chains and animal production, which have not received any notable support from the MAIF/DGARD in contrast to the animal health component, where the DGAHVQ is involved in some of the country's animal health treatments. None of the livestock institutions are currently able to plan and implement the necessary strategies, policies, and plans to improve and revive the sector (*FAO, 2023b*).

49. There are also identified **institutional gaps related to sector-wide linkages, relationships, and synergies**. Specific issues include lack of communication among ministries and between ministries, inadequate vertical and horizontal collaboration among institutions; weak research-extension-farmer linkages; and lack of communication and collaboration with the private sector. The management of the institutions presents special challenges (*FAO, 2023b*). The assessment found that livestock institutions and authorities work independently, rarely coordinate, and rarely plan their livestock

interventions together. This is largely because livestock authorities and institutions report to different sectors and authorities. The assessment recommended, therefore, creating a livestock sector under which the DGAHVQ, DGARD, and National Livestock Research Institute report rather than reporting to the Agriculture Services Sector, Agriculture Production Sector, and AREA, respectively.

50. Improving the **technical capabilities of the MAIF and agriculture offices**. The MAIF and agriculture offices of the governorates lack quality human resources. In large part, this is due to a shortage of qualified employees, a lack of government recruitment since 2011, and a lack of access to advanced capacity building programs (*FAO, 2023b*). To address these capacity gaps, the assessment recommended a two-way approach. (a) since MAIF and agriculture offices have the capability of hiring temporary staff (contract), they should consider recruiting qualified personnel in departments that have a shortage of specialists or professionals. (b) it is recommended to focus on medium- and long-term capacity building programs rather than short-term ones, which, despite their high costs, had only limited impact on improving capacity on the ground. An array of capacity-building programs is prioritized, including surveillance and epidemiology, laboratory diagnosis and residue testing, quarantine management, advanced food inspection and food safety, fodder production technology, advanced animal nutrition and production, dairy processing technology, breeding and artificial insemination, beekeeping, and honey production. Long-term training programmes should focus on the early and mid-level staff who can provide the services required over a longer period of time, rather than the aging and retiring staff.
51. **MAIF/DGAHVQ and its partners take immediate action in order to restore the veterinary laboratory and quarantine capacities**. For the laboratory component, priority should be given to those at the major points of entry, particularly in Aden, Mukalla, and Al-Mahara, as well as Al-Wadiah and Shihin (*FAO, 2023b*). The assessment recommended developing standard operating procedures for quarantine operations throughout the country. DGAHVQ shall also scale-up, improve its presence in all PoEs and quarantines. The assessment recommended an urgent expansion of the Aden quarantine to accommodate more live animals and to reduce the illegal importation due to limited space in the official quarantines. The assessment recommended closing the additional quarantine in the Aden main livestock market. If this immediate closure cannot be achieved soon, it is recommended that quarantine and market be separated completely to reduce disease transmission risks. The assessment emphasizes on the urgent need for the military forces to evacuate the Mokha quarantine. despite the high level of illegal importation of live animal, there is no communication and coordination between the DGAHVQ and the HoA countries, particularly Somalia, where most of the smuggled animals originate from. A quarantine forum that gathers the quarantine authorities and livestock trade on both sides should be formed to identify bottlenecks and solutions to curb the illegal imports (*FAO, 2023b*).
52. **The absence of Investment in livestock research, innovation, and technology transfer**. Immediate reactivation of the National Livestock Research Institute is needed to restore and expand prewar technology testing in breeding, fodder production, and animal health. The center may serve as a potential site for the introduction and dissemination of livestock technologies such as artificial insemination, breeding, improved feeding and nutrition, and husbandry/health practices (*FAO, 2023b*).

53. **Improving the data availability and access in the livestock sector.** There is a significant data gap for the Yemeni livestock. MAIF, agriculture offices, and partners must prioritize the documentation and publication of relevant information. Reviewing and updating livestock data, particularly livestock populations, disease mapping, and production data should be a priority (*FAO, 2023b*).

3.2 Overview of the Animal Health Sector in Yemen

54. The animal health sector has a long-standing history, deeply rooted in the country's agricultural traditions. Due to the current conflict situation, infectious diseases were spread among the animals. This has severely affected and disrupted community livelihoods, and regional and international trade in live animals and their products causing significant financial damage and threatening human health (*Ministry of Agriculture and Irrigation, 2013*).
55. Annual losses that directly affect farmers through animal mortality is estimated at 20 billion Riyals ($ 100 million), while direct losses associated with diseases (morbidity) of up to 25% of productivity, and thus estimated annual losses of production at about 40 billion Riyals ($ 200 million) (*Sustainable Livestock Health for Better Production, Nutrition, and Life in Yemen, n.d.*). Since the start of the crisis and despite efforts of surveillance made by the competent authorities, different transboundary animal diseases (TADs) have been observed among the livestock. The common endemic diseases include Peste des petits ruminants (PPR), Sheep and Goat Pox (SGP), Lumpy Skin Diseases (LSD), Contagious Caprine Pleuropneumonia (CCPP), Brucellosis, Foot, and Mouth Diseases (FMD), Old World Screwworm (OWS) and Clostridia infections. Other diseases such as Rabies, Brucellosis and Blue Tongue are also in circulations with no means to test and confirm. The re-emergence and spread of the disease remain a risk. With the climatic changes and the heavy rainy season, the risk of Rift Valley Fever (RVF) remains high since 2019, although the disease was controlled after its first attack in 2000 (*Abdo-Salem et. al., 2011*). Foot and Mouth Disease attacks are regular in Yemen, however, the virus serotype in circulation is not confirmed. After the onset of SAT-2 in the neighboring countries in the Arabian Peninsula, Foot and Mouth Disease has become one of the big problems in the region. Pest des Petits Ruminants is widely widespread in Yemen, although the virus was isolated in 2000.

Table 2: Yemen's Position within the Roadmap for PPR and FMD Progressive Control Pathways

	Current Status	Roadmap Position	Challenges	Support & Initiatives
PPR	PPR is widespread in Yemen, with outbreaks reported throughout the country	Yemen is classified as Stage 1 (Control and Containment) of the Global PPR Eradication Programme (GREP) roadmap. This stage focuses on basic disease control measures like surveillance, vaccination, and movement restrictions.	The conflict has severely hampered PPR control efforts, hindering vaccination campaigns, disrupting surveillance systems, and weakening veterinary services.	FAO, OIE, and other international organizations are providing support to Yemen for PPR control, including vaccination campaigns, capacity building for veterinary services, and raising awareness among farmers.
FMD	FMD is also endemic in Yemen, with outbreaks occurring regularly.	Information on Yemen's specific stage within the FMD Progressive Control Pathway (PCP-FMD) is not readily available. However, given the widespread presence of the	Similar to PPR, the conflict significantly impedes FMD control efforts. Additionally, Yemen lacks the infrastructure and resources necessary for effective FMD control, such as diagnostic	The FAO, OIE, and other organizations are supporting Yemen in improving FMD control through activities like strengthening veterinary services, implementing surveillance

		disease, it's likely in the early stages of control.	laboratories and vaccine production facilities.	systems, and promoting risk-based biosecurity measures.

Source: FAO EMPRES - Yemen: https://www.fao.org/countryprofiles/index/en/?iso3=YEM;
OIE - PPR in Yemen: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10093352/;
FAO FMD Progressive Control Pathway: https://www.fao.org/eufmd/global-situation/pcp-fmd/en/

56. The vaccination campaigns for the epidemic diseases were almost stopped except for some interventions. Due to the current conflict situation, most of the infrastructures were destroyed. The surveillance system has collapsed, the regional labs need to be rehabilitated, the quarantine stations are suffering from insufficient materials and equipment which were destroyed, the surveillance systems are destroyed or not working effectively.

3.3 World Organization for Animal Health (WOAH) PVS pathway missions report for Yemen

57. In 2007 and 2014, Yemen requested the World Organization for Animal Health (WOAH) to carry out evaluation of the Veterinary Services of the Country using the WOAH Performance of Veterinary Services (PVS) tool. The last mission took place between 18 April – 2 May 2014, with the objectives of identifying the main gaps and weaknesses of the Veterinary Services with reference to compliance with the WOAH guidelines. The mission observed, amongst others, that in general, there was found to be insufficient manpower, both in terms of numbers and sometimes the level of technical capability for the Veterinary Authorities to perform all of its core functions effectively, at central, regional and field levels. Generally, the organizational structure of the Veterinary Authorities has remained relatively stable over the recent past. But the Veterinary Authorities lack a clearly defined chain of command and most of its decisions are made on the basis of what little budget is available. The State and donor community have been investing heavily in new infrastructures. However, the operational budget for the entire Veterinary Services falls way below the level necessary to allow anything more than a very basic level of functional activity. This situation has impacted very negatively, activities such as disease prevention, control and surveillance programmes. In some areas, there is a widespread network of Veterinary Assistants, Veterinary Technicians and community animal health workers (CAHW). Many of the existing staff are now approaching retirement age and there are only a very few younger officers who have joined the service in recent years, thus an age gap is becoming very apparent. The current legal framework to regulate activities of the Veterinary Authorities at all levels (trade of animals and animal products, control of animal food processing facilities) is not in conformity with international standards. In addition, the lack of regulation of the sale and use of Prescription only Medicines (POMs) gives cause for concern. There is an urgent need to review and revise this legal framework. There is also an urgent need for establishing a Veterinary Statutory Body capable of developing a Code of Conduct for veterinarians or veterinary paraprofessionals and applying sanctions. The situation of the Veterinary Authorities is globally unsatisfactory and will be substantially improved if the decision makers give this sector the priority that it deserves in view of the importance of the economic challenge and the risks involved in terms of food security, One Health, and safety.

Table 3: PVS Missions completed in Yemen and their level of confidentiality.

	Date when conducted	Level of confidentiality	Comments (if any)
WOAH PVS initial Evaluation	2007	Report was shared with WOAH partners and donors	
WOAH PVS Evaluation and Gap Analysis	2014	Report was shared with WOAH partners and donors	Due for follow up mission in 2023

3.4 Livestock diseases in Yemen

58. The economic impact of livestock diseases in Yemen is substantial and poses a significant challenge to the agricultural sector. The arid and harsh climate of Yemen coupled with limited access to veterinary services has made the control and prevention of these diseases extremely difficult. A study conducted by the World Organization for Animal Health (WOAH) estimated that FMD alone causes an annual economic loss of $47 million in Yemen. Livestock losses due to mortalities and culling measures to control outbreaks result in a decline in meat and dairy production, leading to lower availability and higher prices for consumers. The decline in exports negatively affects foreign exchange earnings. The costs associated with implementing control measures, such as vaccination campaigns, laboratory testing equipment, and surveillance systems further burden the already fragile economy. The lack of awareness and education about preventive measures, biosecurity protocols, and vaccination campaigns exacerbates the problem further. Addressing these challenges requires investment in disease surveillance and prevention programs, improvement of veterinary services, raising awareness among farmers about preventive measures, and diversifying income sources for those affected by livestock losses.
59. There are several significant diseases that pose great threats to the livestock industry in Yemen. No attempt has been made to include all infections and diseases existing in Yemen, a selection has been made of some that are of principal interest in the field of public health and stand out as major threats to the agricultural sector (zoonotic diseases). The prevalence of these diseases underscores the urgent need for effective control measures such as widespread vaccination campaigns and improved biosecurity practices along the value chains to safeguard animal health and mitigate financial losses within the livestock industry. Common livestock diseases having devastating consequences on animal health and productivity and leading to severe economic losses for farmers who heavily rely on livestock for income generation are:

Peste des Petits Ruminants (PPR)

60. Peste des Petits Ruminants (PPR) is currently endemic in Yemen. It is a contagious viral disease that has over the years been identified as the most important limiting factor in the realization of the full potentials of sheep and goats in Yemen. The risk factors for PPR transmission and spread along the small ruminant value chain in Yemen are not well studied, but some possible factors are:
    - The movement of animals across borders or within the country for trade, grazing, or religious festivals.

- The co-mingling of different species of small ruminants or wildlife in shared grazing areas, markets, slaughterhouses, or transport vehicles.
- The lack of biosecurity measures and hygiene practices in small ruminant production systems.
- The low level of awareness and knowledge among small ruminant farmers, traders, consumers, and veterinarians about PPR symptoms, diagnosis, prevention, and control.
- Levels of vaccination coverage in light of the current political dispute.

61. PPR occurrence is impacting negatively on food security and the livelihoods of rural women and youth who are the main keepers of sheep and goats in the country. It has devastating and far-reaching socio-economic impacts on small ruminant farmers. It is estimated that livestock-derived income losses due to PPR vary between 21% and 99% (Legnardi et al., 2022). A FAO report estimates that between 2016 and 2019, PPR caused losses of about $2.1 billion in terms of animal deaths, reduced milk and meat production, and decreased trade (FAO, 2019).
62. The first confirmed PPR outbreak in Yemen occurred in 1989 in imported sheep during quarantine in Mokha, albeit a PPR case was already suspected in 1983 in the Tihamah region. In 2000, a larger outbreak was then reported in imported Somali sheep in the Hadhramaut region and since then, PPR has been considered endemic to the country. More than 650 PPR outbreaks have been reported through the WOAH WAHIS from 2005 to 2015, but, after that date, its epidemiological status has become unclear due to the collapse of the surveillance system due to funding issues and shortages of diagnostic equipment and qualified personnel.
63. The status of PPR control and eradication activities in Yemen is not clear. The national Peste des Petits Ruminants (PPR) control and eradication plan in Yemen relies on a mass vaccination strategy. The ongoing conflict has made it difficult to implement the PPR control and eradication plan. It has disrupted the delivery of veterinary services, increased the uncontrolled movement of animals across borders, and reduced the availability of feed and water. In 2008, the Yemen Agricultural Support Program (YASP) livestock extension agents took the lead as the first to report the outbreak of PPR, sheep pox, screwworm, and other diseases. The YASP provided training, technical assistance, and veterinary services to small ruminant farmers to help them manage animal diseases and improve their livelihoods. In 2020, the FAO supported smallholder's resilience in Yemen through animal disease control, vaccination, and mass treatment campaigns, strengthening disease surveillance and reporting systems, training veterinarians and community animal health workers, distributing animal feed and veterinary supplies, and raising awareness among livestock owners about PPR and other animal diseases.
64. The FAO, in collaboration with the Yemeni government and other partners such as the International Committee of the Red Cross (ICRC), has been implementing a national PPR control and eradication program since 2017 (Center for Preventive Action, 2023). The program aims to vaccinate at least 80% of the susceptible population, improve the surveillance and diagnosis of PPR, raise awareness among livestock owners and traders, and strengthen the capacity of veterinary services (Center for Preventive Action, 2023). As of June 2020, the program had vaccinated more than 12 million animals in 19 governorates (Center for Preventive Action, 2023). The campaign help to protect the animals from PPR, SGP, and other infections, and reduce the risk of transmission to humans. This is line with the

Global Strategy for the Control and Eradication of PPR that has been prepared by PPR secretariat of the FAO-WOAH Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs).

Sheep and Goat Pox

65. Sheep and goat pox are contagious viral diseases that affect sheep and goats. These diseases are prevalent in Yemen. They cause high morbidity and mortality in infected animals and pose a serious threat to the livelihoods of livestock-dependent households (Zewdie et al. 2021; UN news, 2021). Under the World Bank funded FSRRP programme (May 2021 - June 2025), FAO has been supporting the vaccination and treatment of sheep and goats against sheep and goat pox and other diseases in 16 districts throughout the country (UN news, 2021). FAO has a target to vaccinate 8 million goats and sheep, while the ICRC has a target of 20 million. The campaign is for both PPR and SGP as well as treatment against internal and external parasites.
66. The control and prevention of these diseases depend on timely recognition of outbreaks, vector control, movement restriction and vaccination (Zewdie et al. 2021). The vaccine used in Yemen is derived from the Kenyan shoat pox virus (KSGPV) strain, which is effective and safe for both sheep and goats. Sheep and goat pox are serious animal diseases that can have severe consequences on the economy and food security of Yemen. Therefore, it is important to raise awareness among livestock owners and health workers about the symptoms, transmission and prevention of these diseases. It is also essential to support the efforts of FAO and other organizations to vaccinate and treat animals at risk.
67. According to FAO, the best way to prevent and control sheep and goat pox in Yemen is to conduct regular vaccination and treatment campaigns, in collaboration with local agriculture offices and veterinary services (FAO, 2020). Vaccination with live attenuated virus vaccines can provide good immunity against the disease (Zewdie et al. 2021). Treatment of infected animals with antibiotics and anti-inflammatory drugs can help reduce secondary bacterial infections and inflammation. It is important to implement biosecurity measures such as isolating infected animals, avoiding illegal animal movement, disinfecting equipment, and disposing of carcasses properly (Gelaye and Lamien, 2019; Kang'ethe, 2020).

Foot-and-mouth disease

68. Yemen is one of the countries where FMD is endemic and poses a major threat to the livelihoods of millions of people who depend on livestock (EuFMD n.d.). Foot-and-mouth disease (FMD) is a highly contagious viral disease that affects cloven-hoofed animals. It can cause severe economic losses and affect food security and livelihoods of people who depend on livestock. According to the World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD), Yemen is included in the FMD Pool 4 (East Africa), which has FMDV serotypes O, A, SAT 1, SAT 2 and SAT 3 (WRLFMD, 2022). The history of FMD outbreaks in Yemen shows that serotypes O and A have been reported since 1973, while serotypes Asia 1, SAT 1 and SAT 2 have been reported sporadically in 1979, 1984 and 1990 respectively (Aleryani, n.d.).

69. Official information about the FMD situation in Yemen is rather scarce. The latest report of a suspected FMD outbreak in Yemen was on September 18, 2022, when a team from the Agriculture and Irrigation Office in Sana'a Governorate, the General Administration of Animal Health at the Ministry of Agriculture and specialists from the FAO carried out a field visit to the Directorate of Al-Haima Al-Kharjiya. There are different strategies to control FMD in Yemen, depending on the epidemiological situation, the availability of resources and the objectives of the stakeholders. FMD is a notifiable disease under the World Organization for Animal Health (WOAH) and requires immediate reporting and control measures.
70. The prevention and control of FMD depends on several factors, such as surveillance, vaccination, biosecurity, movement restrictions, quarantine and culling of infected animals. The WRLFMD provides technical support and guidance to countries affected by FMD through its network of regional reference laboratories and collaborating centers (WRLFMD, 2022).
71. One of the main tools to guide FMD control in endemic countries is the Progressive Control Pathway for Foot-and-Mouth Disease (PCP-FMD), developed by FAO and EuFMD and endorsed by the WOAH (EuFMD n.d.). According to the latest PCP-FMD report from 2020, Yemen is currently in Stage 1 of the PCP-FMD, which means that it has completed a Risk Assessment Plan (RAP) and has some understanding of the FMD situation in the country. The next step for Yemen is to develop and implement a Risk-Based Strategic Plan (RBSP) that describes how it intends to reduce the impact of FMD in at least one husbandry sector. The RBSP should be based on a comprehensive analysis of the FMD risks, epidemiology, socio-economic factors and stakeholder preferences in the country. The RBSP should be endorsed by the government Ministry to ensure that sufficient resources are allocated to FMD control.
72. One of the key components of the RBSP is the choice of vaccination strategy, which can vary from no vaccination to mass vaccination, depending on the FMD status, circulating strains, vaccine availability, cost-effectiveness and feasibility. Vaccination can reduce the clinical signs and transmission of FMD, but it does not prevent infection or carrier status. Therefore, vaccinated animals may still pose a risk for FMD spread and need to be managed accordingly. The choice of vaccination strategy and management option for vaccinated animals should be based on a careful evaluation of the costs and benefits, as well as the feasibility and acceptability, of each option in the specific context of Yemen. The PCP-FMD provides a framework and guidance for such an evaluation, as well as for monitoring and evaluating the progress and impact of FMD control in Yemen (EuFMD n.d.).

Lumpy skin disease

73. Lumpy skin disease (LSD) is a serious viral disease that affects cattle. The disease can cause significant economic losses due to reduced milk production, weight loss, infertility, abortion, secondary infections, and sometimes death. The disease causes fever, swollen lymph nodes, skin nodules, ulcerative lesions, and sometimes death. It can also reduce milk production, damage hides, cause abortion, infertility, and secondary bacterial infections. LSD is endemic and has recently spread to the Middle East and Asia. The diagnosis of LSD is based on clinical signs, epidemiological history, and laboratory tests. The disease can occur in all agroclimatic zones, but it is more prevalent in low-lying areas and near water sources. The main mode of transmission is by insect vectors, such as mosquitoes,

biting flies, and ticks. Infected bulls can also shed the virus in their semen, but it is not clear if this can cause infection in cows. The disease is not zoonotic, meaning it does not affect humans. The prevention and control of LSD depend on vaccination, surveillance, quarantine, movement restriction, vector control, and biosecurity measures. There is no specific treatment for LSD, but supportive care and antibiotics can be given to reduce secondary complications.

74. Vaccination should be done under strict supervision and in accordance with the WOAH guidelines. LSD is a notifiable disease according to the WOAH, which means that any occurrence or suspicion of the disease must be reported to the relevant authorities. This helps to monitor the epidemiological situation and implement appropriate control measures. LSD is also a trade-restricting disease, which means that it can affect the export of livestock and their products from affected countries. LSD is a serious threat to the cattle industry and animal welfare. It is important to raise awareness about the disease among farmers, veterinarians, and policy makers. It is also essential to conduct further research on the epidemiology, diagnosis, pathogenesis, and vaccine development of LSD. By working together, we can prevent and control this devastating disease.

Rift Valley fever

75. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock. The majority of human infections result from direct or indirect contact with the blood or organs of infected animals. The virus can be transmitted to humans through the handling of animal tissue during slaughtering or butchering, assisting with animal births, conducting veterinary procedures, or from the disposal of carcasses or fetuses. Certain occupational groups such as herders, farmers, slaughterhouse workers, and veterinarians are therefore at higher risk of infection. Human infections have also resulted from the bites of infected mosquitoes. Following infected livestock trade from the horn of Africa, RVF spread in September 2000 to Saudi Arabia and Yemen, marking the first reported occurrence of the disease outside the African continent. In 2000, the Ministry of Public Health in Yemen reported 1087 suspected cases, including 121 deaths. Because the symptoms of Rift Valley fever are varied and non-specific, clinical diagnosis is often difficult, especially early in the course of the disease. RVF is able to infect many species of animals causing severe disease in domesticated animals including cattle, sheep, camels and goats. Sheep and goats appear to be more susceptible than cattle or camels.
76. A one Health approach bringing together different expertise to develop a coordinated national action plan for RVF is essential, aligned to the FAO Rift Valley Fever Action Framework. The plan should lay out the actions that need to be taken by different stakeholders for building national capacity for risk based One Health surveillance, preparedness and response.

Brucellosis

77. Brucellosis is a bacterial disease that can affect both humans and animals. It is caused by different species of the genus Brucella, which can infect various hosts such as cattle, sheep, goats, camels, dogs, and wildlife. Brucellosis is endemic in Yemen, meaning that it occurs regularly in the country and poses

a significant public health and economic burden (Al-Shamahy et.al., 2000). Some of the risk factors for human brucellosis in Yemen are: Working as a farmer, shepherd, or microbiologist, which increases the exposure to infected animals or their products. Drinking fresh milk or laban (a type of buttermilk) from infected animals without pasteurization or boiling. Having a low socio-economic status or education level, which may limit the access to health care or awareness of preventive measures.

78. Brucellosis can cause various symptoms in humans, such as fever, headache, joint pain, fatigue, and enlarged spleen or liver. The diagnosis of brucellosis can be challenging, as the symptoms are often nonspecific and like other diseases (Al-Shamahy et.al., 2000). The treatment of brucellosis usually requires a combination of antibiotics for several weeks or months. The control of brucellosis in Yemen faces many challenges, such as political instability, insufficient resources and infrastructure, variation of livestock husbandry systems, and traditional cultural practices. A comprehensive and interdisciplinary approach is needed to address the complex factors that contribute to the persistence and spread of the disease in the region.

Avian influenza (AI)

79. Avian influenza (AI) is a viral infection that affects birds and sometimes mammals, including humans. AI can cause severe illness and death in poultry and wild birds, as well as pose a threat to public health. AI is caused by influenza A viruses that belong to different subtypes, such as H5N1, H7N9, H9N2, etc. Some of these subtypes can be transmitted from birds to humans and cause severe respiratory infections, pneumonia, organ failure, and death. AI viruses are classified into two types: low pathogenic (LPAI) and highly pathogenic (HPAI), based on their ability to cause disease and death in poultry. HPAI viruses can also cause severe illness and mortality in humans, especially if they acquire the ability to transmit efficiently from person to person. One of the most widespread and dangerous AI viruses is the H5N1 subtype, which has caused outbreaks in poultry and wild birds in many countries, as well as sporadic human infections. H5N1 viruses are genetically diverse and can be grouped into different clades and subclades. Some of these clades have been detected in the Middle East (ME) and North Africa regions, where H5N1 is endemic in some countries. Yemen is part of the ME region, where H5N1 and H9N2 viruses circulate widely among wild birds and poultry, posing a continuous threat to animal and human health. The Middle East region also hosts many migratory birds that can carry AI viruses across continents (WHO, 2019).
80. The control and prevention of AI in Yemen is a challenging task due to the ongoing conflict, political instability, weak health system, and lack of resources. However, some measures have been taken by the government and international organizations to prevent and contain AI outbreaks in the country. Yemen has not reported any human case of H5N1 infection since 2006, when two cases were confirmed, one of them fatal1. Yemen has experienced several outbreaks of H5N1 in poultry since 2007, the latest one occurring in 2019 in Al Hudaydah governorate (Nagy et al., 2017). Yemen has also reported outbreaks of another AI subtype, H9N2, in poultry since 2012. H9N2 is an LPAI virus that can infect humans, but usually causes mild or asymptomatic infections. However, H9N2 can also exchange genes with other AI viruses, such as H5N1, and potentially increase their virulence or transmissibility (Centers for Disease Control and Prevention, 2023).

81. According to the World Bank (World Bank Group, 2010), the Republic of Yemen implemented an AI Prevention and Control Project from 2007 to 2013, which aimed to strengthen the capacity of the veterinary services, improve biosecurity practices in poultry farms, enhance surveillance and laboratory diagnosis, and raise public awareness about AI risks and prevention. The project also supported the procurement of personal protective equipment (PPE), disinfectants, vaccines, and antiviral drugs for poultry and humans. Therefore, it is important for Yemen to strengthen its surveillance and response capacities for AI, as well as to collaborate with regional and international partners to prevent and control the spread of these viruses. It is also advisable for people who have contact with poultry or wild birds to practice good hygiene measures and seek medical attention if they develop any flu-like symptoms.

82. The prevention and control of AI in humans depends on avoiding exposure to infected birds or their secretions, practicing good hygiene, wearing PPE when handling sick or dead birds, and seeking medical attention if symptoms develop. The prevention and control of AI in poultry involves the use of biosecurity measures, surveillance, vaccination, culling, and disinfection. The prevention and control of AI is a complex and multidisciplinary task that requires cooperation among various sectors such as agriculture, health, environment, wildlife, and security.

Rabies

83. Yemen battles a considerable burden of rabies. According to the World Health Organization (WHO), Yemen is classified as a high-risk country for rabies transmission. Unfortunately, due to the lack of comprehensive surveillance systems, accurate data on rabies cases are difficult to obtain. Rabies is endemic in Yemen, with the majority of cases reported in rural areas where stray dog populations are more prevalent. During the period of 2011-2018, a total of 89,590 possible exposure cases that were bitten by a suspected rabid animal were reported, of which 29% tested positive for rabies (Abdulmoghni *et al., 2020*). The incidence of rabies in Yemen is estimated to be 23 human cases per 1,000,000 population, but data are usually underestimated due to inadequate diagnosis and underreporting of human rabies in many areas of the country (Abdulmoghni *et al*., 2021). Rabies remains a worrying health problem in Yemen, with a higher percentage of cases reported among children and males (Abdulmoghni *et al., 2021*).

84. Several factors contribute to the challenges faced in controlling and preventing rabies in Yemen. The country's political instability has severely disrupted the functioning of healthcare systems, hindering the implementation of effective vaccination campaigns and public awareness initiatives. The scarcity of resources, including vaccines and diagnostic facilities, further exacerbates the situation Rabies vaccines and immunoglobulins quantities were least available in 2016 and 2017 (Abdulmoghni *et al., 2021*). Limited access to veterinary services and the lack of proper dog population management exacerbates the spread of rabies. These challenges are compounded by low levels of public awareness about rabies and its prevention, often leading to delays in seeking appropriate medical care.

85. Despite these challenges, Yemen has initiated several measures to combat rabies. One notable effort is the Veterinary Services Department's rabies control program, which aims to reduce the incidence of rabies through mass dog vaccination campaigns. These campaigns target both owned and stray dogs, focusing on high-risk areas. Yemen has collaborated with international organizations such as

WHO and the Food and Agriculture Organization (FAO) to strengthen its capacity for surveillance, diagnosis, and treatment of rabies cases.

86. In recent years, Yemen has also witnessed the emergence of research and innovation in the field of rabies. Yemeni scientists and healthcare professionals have been actively involved in studying the epidemiology of rabies, developing diagnostic techniques, and exploring new vaccination strategies. These efforts are crucial for understanding the local dynamics of rabies transmission and tailoring control measures to Yemen's specific context. With its devastating consequences for both human and animal populations, it is vital to develop a comprehensive strategy to control and eradicate rabies in Yemen. To effectively control and eradicate rabies in Yemen, a multi-faceted strategy must be devised, encompassing various components. Identifying and addressing risk factors contributing to the spread of rabies, such as unvaccinated animals and inadequate animal control measures, is crucial for effective prevention and control of the disease (Abdulmoghni *et al.*, 2021).

Clostridial infections

87. Clostridial infections can have severe consequences on the health and productivity of livestock. In Yemen, where livestock rearing plays a vital role in the economy and food security, understanding the impact of clostridia is of paramount importance. Clostridia are a group of bacteria that naturally inhabit the gastrointestinal tract of animals, including livestock. While some clostridial species are harmless, others can cause severe diseases in animals, leading to significant economic losses in the livestock industry. Specific research on the prevalence of clostridia in Yemeni livestock is limited. Some have shown that clostridia infections are widespread in Yemeni livestock, particularly in ruminants such as cattle, sheep, and goats. The impact of clostridia infections on livestock in Yemen is significant. Clostridium perfringens, for instance, causes enterotoxemia, a condition characterized by severe diarrhea, abdominal pain, and sudden death. These diseases can lead to sudden death, reduced growth rates, decreased milk production, poor reproductive performance, and increased susceptibility to other infections. The economic toll of clostridial infections is not limited to direct losses but also includes expenses associated with veterinary treatments and preventive measures. This disease not only leads to substantial economic losses due to decreased productivity and increased mortality rates but also poses a threat to food safety and human health.

88. Clostridium difficile, on the other hand, can cause colitis and enteritis, leading to weight loss, reduced growth rates, and overall poor animal welfare. Several factors contribute to the high prevalence of clostridia infections in Yemeni livestock. Poor hygiene and inadequate sanitation practices in animal husbandry systems create an environment conducive to the growth and transmission of clostridia bacteria. Limited access to clean water, proper waste management, and suboptimal vaccination protocols further exacerbates the problem. Yemen's climatic conditions, characterized by high temperatures and arid landscapes, create an environment that favors the survival and proliferation of clostridia bacteria. Addressing the issue of clostridia infections in Yemeni livestock requires a multi-faceted approach that encompasses both preventive and curative measures. The strategies should be based on scientific evidence, local conditions, and cost-effectiveness.

3.5 Impact of transboundary animal diseases

89. Transboundary animal diseases (TADs) refer to infectious diseases that can spread across national borders, affecting livestock, wildlife, and humans in multiple countries. TADs pose a severe threat to this sector, leading to significant economic losses. The impact of transboundary animal diseases (TADs) on food security in Yemen is profound. One of the most prominent TADs affecting Yemen is the highly contagious Foot-and-Mouth Disease (FMD). According to a study conducted by the Food and Agriculture Organization (FAO), outbreaks of FMD result in substantial losses due to decreased milk and meat production, reduced market access, and high mortality rates among infected animals. These losses exacerbate the already fragile agricultural economy in Yemen and hinder the country's path towards food security. Yemen has also been assessed as high risk Yemen, due to cross-border grazing with Oman according to the risk assessment for SAT-2 conducted by FAO (McLaws et al., 2023) the economic impact according to the importance of livestock (cattle, sheep, goats and pigs) and POAO for countries' food and nutrition security, economies, labor markets, and the livelihoods of those most vulnerable is also calculated.
90. The Yemeni government, along with international organizations and NGOs, has recognized the importance of addressing zoonotic diseases and has implemented various control and prevention measures. The Food and Agriculture Organization of the United Nations (FAO) is supporting livestock vaccination and treatment campaign in Yemen as part of its continued efforts to control transboundary animal diseases and build resilience of communities through regular vaccination and treatment activities (Scaling up Yemen's Fight Against Animal Disease Outbreaks*, n.d.*). In 2022/2023, over 2 million sheep and goats in 5 governorates (Lahj, Al Dhalee, Shabwa, Al Mawheet and AlBaydha) were vaccinated against Peste des Petits Ruminants (PPR) and Sheep and Goat Pox (SGP),and treated against various internal and external parasites and diseases. PPR and SGP are two highly infectious animal diseases that affect most small ruminants in Yemen, decreasing the viability of the livestock sector, which is one of the remaining lifelines and income sources for the majority of the rural population. The campaign is part of the implementation of a five -year programme titled Food Security Response and Resilience Project (FSRRP) funded by the World Bank and was carried out in close coordination with local authorities and the Ministry of Agriculture. The campaign with the World Bank funding is continuing with a planned target for FAO to vaccinate and treat an additional 4 million sheep and goats by May 2024. In addition, ICRC, with support from the World Bank funding will be scaling up the campaign with total target of 20 million sheep and goats by June 2025.

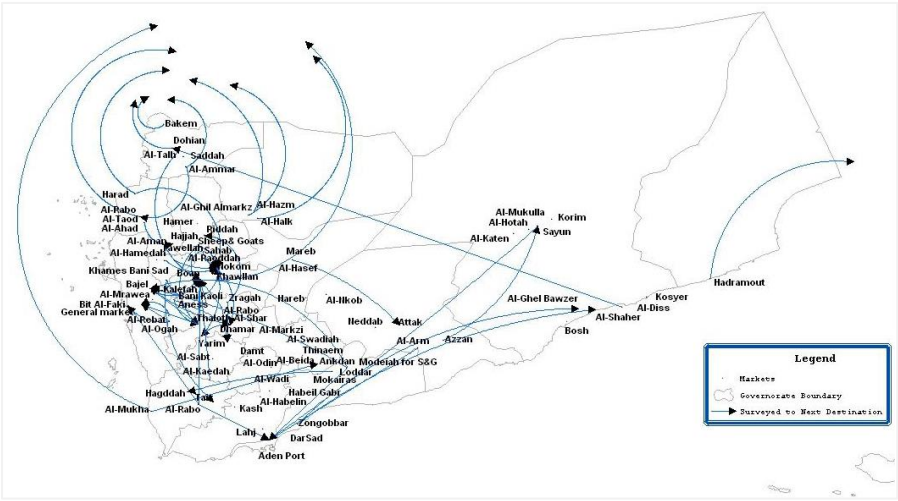

Figure 7: Route of Yemeni livestock movement between Regional Markets Surveyed to Next Destination Markets

Source: Survey made by ARD, INC for the LMT (Feb. 2005). rr-middleeast.woah.org/wp-content/uploads/2021/01/fmd-2013-yemen.pdf

91. TADs not only decrease livestock production but also disrupt the supply chain, leading to reduced availability and increased prices of animal-source foods. This affects the nutritional status of vulnerable populations, particularly children and pregnant women, who rely on animal-source foods for essential nutrients. TADs lead to trade restrictions imposed by neighboring countries to prevent the spread of diseases. These restrictions further limit Yemen's access to affordable and diverse food options, heightening the risk of malnutrition and food insecurity. TADs have significant implications for public health in Yemen. Many TADs can be transmitted from animals to humans, either directly or through contaminated food products. Yemen is vulnerable to a range of zoonotic diseases due to its diverse climate, which supports a wide variety of animal species. Zoonotic diseases such as Brucellosis, Leishmaniasis, Tuberculosis, Rift Valley Fever, and sometimes Rabies pose a considerable threat to human health. These diseases not only cause severe illness and mortality but also place an additional burden on the already strained healthcare system in Yemen. The close interaction between humans and animals in rural areas, combined with limited awareness and healthcare services, further exacerbates the risk of zoonotic disease transmission.
92. Efforts to control and prevent these diseases have been initiated, focusing on surveillance, veterinary services, public awareness, and healthcare infrastructure improvements. However, the ongoing conflict and limited resources present significant obstacles to effectively combat zoonotic diseases in Yemen. Continued investment, both domestically and internationally, coupled with political stability, is crucial to mitigate the impact of these diseases on public health and ensure a safer future for the Yemeni population. Addressing TADs in Yemen requires an integrated One Health approach, involving collaboration between veterinary and human health sectors, to effectively control and prevent disease outbreaks.

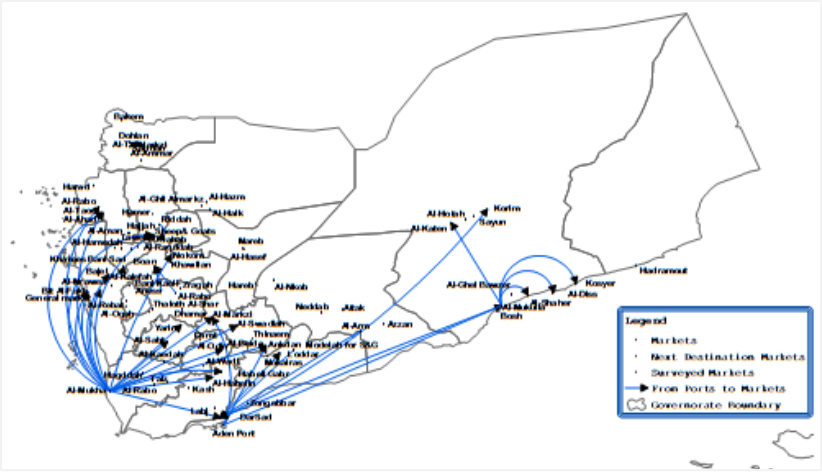

Figure 8: Routes of Movement of Livestock from Ports of Entry to Markets

Source: Survey made by ARD, INC for the LMT (Feb. 2005). rr-middleeast.woah.org/wp-content/uploads/2021/01/fmd-2013-yemen.pdf

3.6 The organization of the veterinary services in Yemen

93. The Ministry of Agriculture and Irrigation (MAI) and Ministry of Agriculture, Irrigation and Fisheries (MAIF) are responsible for overseeing the enforcement of animal health regulations. One of the key regulatory measures in place is the requirement for veterinary inspections and certifications for animal imports and exports. This ensures that only healthy animals are traded, minimizing the risk of introducing diseases into the country. The Ministries conducts regular inspections of farms and slaughterhouses to monitor compliance with animal health standards and guidelines. The Ministries works in collaboration with international organizations to develop and implement strategies for disease control and prevention (FAO, 2023b).
94. The Veterinary Services Directorate is responsible for coordinating and implementing policies related to animal health. It focuses on enhancing veterinary infrastructure, training veterinarians, and improving diagnostic capabilities. Ensuring proper animal welfare is an integral part of the animal health sector. The government has implemented regulations to protect animals from cruelty, neglect, and abuse. The Animal Welfare Authority is responsible for enforcing these regulations and raising awareness among animal owners and the public. Efforts are also being made to improve animal husbandry practices, including appropriate housing, feeding, and handling of animals (FAO, 2023b).
95. The General Directorate of Animal Health & Veterinary Quarantine (GDAH&VQ), of the Ministry of Agriculture & Irrigation (MAI), is designated by law as being the Competent Authority (Law No 17 for the Year 2004, Pertaining to the Organization and Protection of Livestock) and is in the capital of Yemen (Sana'a) (FAO, 2023b). There are 21 veterinary offices located at the main urban centers of each of the Governorates. Animal health coverage has been extended by the Veterinary Authority from the Governorate level to the District level, by posting veterinarians and Veterinary Assistants and Veterinary Technicians into District Veterinary Offices. Where it is not possible to provide every District with veterinary coverage, a staff member is placed strategically in a cluster of Districts, distributed according to the animal population density and the geographical location of these Districts.

96. Official veterinarians employed by the Veterinary Authority are responsible for the Import regulation and export certification; Prevention and control of major epidemic diseases (TADs); risk analysis (not currently performed), quarantine and animal movement control (rarely enforced); Licensing of veterinarians and veterinary para-professionals (who are registered by the Yemen Veterinary Association (YVA); licensing of importation, manufacture, distribution, wholesale and retail sale of veterinary medicinal products; licensing of processing facilities for animal products; inspection of all licensed facilities for veterinary pharmacies and clinics, food processing facilities for products of animal origin, veterinary medicinal product manufacturing facilities, all veterinary laboratories; official laboratory testing related to animal health, notification, food safety on the domestic market as well as for the export of animals and animal products; border inspection for the import and export of live animals and animal products; the development and drafting of regulations and ministerial decrees related to the veterinary domain (FAO, 2023b).
97. Most state-employed veterinarians and veterinary paraprofessionals at central, regional, and field levels are engaged in providing private veterinary services from pharmacies/clinics. The Yemen Veterinary Association in collaboration with FAO, NGOs and other organizations is engaged in establishing a village-based cadre of privately operating Community-based Animal Health Workers (CAHWs). These animal health care providers are linked, in some cases to private veterinarians, private veterinary assistants or veterinary technicians and to the nearest state-employed veterinarian or veterinary technicians at the District level, for the purposes of supervision, monitoring and disease reporting. The veterinary assistants engage the private veterinarians, veterinary assistants and CAHWs to assist in the implementation of vaccination campaigns on an ad hoc basis through an informal contractual agreement. The private and public animal health service providers form an expanding surveillance network in the areas of the highest livestock density in the central highlands (especially, Hodeida, Dhamar and Abs Governorates) (FAO, 2023b).

3.7 Challenges of the Animal Health Sector in Yemen

98. The challenges faced in maintaining animal health in Yemen are complex and multifaceted. The ongoing conflict, economic crisis, and limited access to veterinary services have created a dire situation for animals in the country. The conflict has resulted in the displacement of millions of people, leaving their livestock abandoned or neglected. This has led to an increase in disease outbreaks and malnutrition among animals, as well as their potential transmission to humans. Additionally, the economic crisis has severely restricted resources for veterinary care, vaccinations, and proper nutrition for animals. Access to animal health services is also limited due to damaged infrastructure and insecurity. Lack of knowledge and awareness about animal health practices further compounds these challenges. Addressing these issues requires a comprehensive approach that involves collaboration between local communities, national authorities, international organizations, and humanitarian agencies to provide essential veterinary services, training programs on animal health management practices, emergency relief aid, and support for sustainable livelihoods centered around good animal husbandry practices to control and prevent diseases.

Damaged public livestock infrastructures

99. Years of airstrikes, bombings, and armed clashes have deeply impacted the vital infrastructure required for the efficient functioning of veterinary clinics. These attacks on veterinary facilities have led to widespread destruction, causing significant setbacks in animal healthcare services. The aftermath of such assaults is characterized by demolished buildings, shattered equipment, and a loss of resources that severely hinder the capacity to provide crucial medical assistance for animals affected by conflict zones or natural disasters (FAO, 2023b). This catastrophic loss disrupts not only the provision of immediate care but also long-term treatments, disease control programs, and education about preventive measures. As a consequence, these destroyed clinics have devastating consequences on animal well-being as well as public health interventions that aim to curb zoonotic diseases and protect both humans and animals from further harm. There is one Veterinary Diagnostic Laboratory services currently operational and one new Central Veterinary Laboratory (CVL) located at the headquarters in Sana'a which has recently been built and is in the final stages of being completed with new equipment being installed. There is one recently upgraded Regional Veterinary Laboratory (Hodeida) and two other new ones have also been constructed in the Governorates of Abs, and Taïez, supporting the areas of highest livestock population. The rehabilitation and reconstruction efforts for these damaged veterinary clinics are essential in ensuring access to quality healthcare services for vulnerable animal populations amidst ongoing conflicts or post-conflict scenarios. The FAO (2023b) Livestock Institutional Capacity Assessment Report has Identified public livestock infrastructures to be constructed/rehabilitated/equipped (*FAO, 2023b*).

Lack of feed, especially quality feed, and water

100. Feed for livestock production is a significant limitation to growth in the sector. The availability and quality of feed for livestock production pose a considerable constraint on the growth of the sector in Yemen. The country's arid climate and limited water resources make it challenging to cultivate nutrient-rich fodder crops for animals. Dependence on rain-fed agriculture exacerbates this problem, as unpredictable and erratic rainfall patterns result in insufficient crop yields. Poultry production relies on grain and oilseed- based feed, and currently all soy, and most maize, resources are imported. The feed concentrate industry is beginning in Yemen, and products often lack animal protein, and other key ingredients, leaving local production deficient. In addition, a tremendous amount of cropland is dedicated to fodder production, and the balance of fodder vs. food production should be studied. The lack of investment in modern farming technologies and infrastructure further restricts access to high-quality feedstuff such as alfalfa or improved grasses for livestock. Most farmers resort to low-cost and low-nutrient options like straw or crop residues, which diminishes the productivity and overall health of their animals. Inadequate nutrition exposes animals to heightened disease susceptibility, reduced milk production, lower reproductive rates, and overall lower-quality meat. The lack of veterinary services and weak animal healthcare infrastructure exacerbate these challenges by limiting disease prevention measures and access to medications. The consequences of these limitations in feed availability and livestock health are dire: decreased income potential for farmers, limited food security for the population reliant on livestock products as staple foods, increased vulnerability to zoonotic diseases, and persistent economic instability further perpetuating the cycle of poverty.

Lack of Veterinary Medicine training and education centers

101. Veterinary Medicine training and education pose significant challenges due to the limited resources and infrastructure that hinder the ability to provide comprehensive training programs for aspiring veterinarians. Political instability and ongoing conflicts have disrupted academic institutions, leading to interruptions in veterinary education. There are very few institutions providing veterinary and animal production education, and only two universities have veterinary medicine colleges, the Sana'a University, and the Dhamar University (FAO, 2023b). The Faculty of Veterinary Medicine at the University of Dhamar has a reduced number of academic staff (veterinarians) and it is reported that the annual intake in the first year is approximately 100 students of which only 30 to 40 reach graduation at the end of the 5-year degree curriculum. Given the lack of academic staff and the absence or/very limited laboratory and clinical facilities, it is difficult to see how veterinary graduates can possibly have what would be considered to be the minimum Day One competencies required of a veterinary graduate. Few colleges offer technical and professional diplomas in veterinary medicine and animal production, which are usually open to graduates of elementary and secondary schools, respectively (FAO, 2023b). This lack of veterinary educational institutions and professionals is more severe and challenging in the Southern part of the country, where no university offers degrees in veterinary medicine or animal production. Only one veterinary college in the Al-Katan/Al-Qatan District of the Hadhramaut Governorate provides a veterinary medicine diploma (2 years). The first batch of veterinary medicine graduates (13 students) graduated in 2022, and 18 are expected to graduate both in 2023 and 2024 (total of 26) (FAO, 2023b). The scarcity of well-equipped veterinary hospitals and diagnostic laboratories restricts the hands-on practical experience necessary for skill development. The shortage of experienced faculty members and specialists' results in inadequate guidance and mentorship for students. The lack of funding further contributes to this issue, as it prevents the procurement of essential equipment and updated textbooks. The absence of continuous professional development opportunities inhibits veterinarians from staying abreast with evolving practices in diagnosis and treatment (FAO, 2023b). To overcome these challenges, it is crucial to invest in infrastructure development, strengthen institutional collaborations with international universities, enforce strict academic standards, provide financial support for students, offer scholarships for further specialization abroad, and ensure ongoing education through workshops or online platforms.

Lack of training facilities for veterinarians and veterinary paraprofessionals

102. The country lacks training facilities for veterinarians and veterinary paraprofessionals, and the GDAHVQ has neither plans nor the required resources to ensure adequate continuing education of its staff. The limited availability of training centers significantly hinders the professional development and skills enhancement opportunities for these individuals. As a result, practitioners struggle to keep up with the latest advancements in veterinary medicine, diagnostics, and treatment techniques. Without proper training facilities, veterinarians are unable to acquire hands-on experience with modern equipment or receive specialized instruction on emerging diseases or surgical procedures (FAO, 2023b). This scarcity limits access to continuing education programs necessary for maintaining licensure and professional standards. The lack of adequate training facilities in Yemen poses a

significant obstacle to the overall quality of care provided by veterinarians and their para-professional counterparts, jeopardizing animal welfare and public health. A lack of veterinarians and veterinary technicians has a negative effect on production and causes unnecessary stock losses. The more remote areas have no easy access to veterinary help. Most drugs are available on the open market, but some are out of date and may well be misapplied. Many farmers are reluctant to spend their extremely limited cash on a possible cure, which may cost 20% of the value of the animal. This is another challenge for extension advisors working with veterinarians. It is imperative that the government collaborates with international organizations and invests resources into establishing comprehensive training centers to address this critical issue.

Shortage of skilled veterinarians

103. The GDAHVQ is not currently in a position to accomplish its tasks due to the very low level of professional, technical, and financial resources available. There is insufficient manpower, both in terms of numbers and the level of technical capability to effectively perform all core functions at regional, central, and field levels. The Ministry of Agriculture & Irrigation has had a moratorium on the recruitment of new officers in place since 2008. Many of the existing staff are now approaching retirement age and there are only a very few younger officers who have joined the service in recent years, thus an age gap is becoming very apparent. If this situation continues for much longer much of the institutional memory of the senior officers will be lost, as they retire or leave to take advantage of better opportunities in the private sector. It will also be difficult for the Veterinary Authority to ensure continuity and transfer of expertise and skills to newly recruited officers. The shortage of skilled veterinarians in Yemen poses a significant challenge to the country's overall animal health and welfare (FAO, 2023b). This scarcity is primarily a result of limited educational opportunities and the ongoing conflicts that have disrupted the veterinary training system. As a consequence, there is a substantial gap between the demand for veterinary services and the available expertise to meet it. This has direct implications for livestock productivity, as well as the control and prevention of zoonotic diseases. Additionally, it impedes crucial initiatives such as vaccination campaigns, disease surveillance programs, and capacity building efforts within the veterinary sector. The lack of skilled professionals also hinders effective emergency response during natural disasters or epidemics that may affect animals (FAO, 2023b).

104. In the areas with higher livestock production such as Al Hudaydah, Dhamar and Abs, veterinarians service the Regional Offices, while Veterinary Assistants or Veterinary Technicians (VTs) cover most District Offices. There is an expanding network of community-based animal health workers (CAHWs), trained and established at village level to provide primary animal health services. This animal health workforce at regional and district levels forms the basis of an effective animal disease surveillance, early warning, and emergency response system. The rest of the country remains insufficiently covered by veterinary professionals or paraprofessionals (FAO, 2023b). This problem is exacerbated in the southern governorates, where the number of veterinarians may not exceed 20. Reliance is mainly on veterinary technicians, animal production technicians, and animal health workers. This is due to the absence of any Veterinary Colleges in the south or Institutes for Technical Veterinary Education compared to the north, which has two Veterinary Colleges (in Dhamar and Sana'a) and two Technical

Veterinary Institutes (in Sana'a and Ibb). As a remedy, addressing this shortage calls for increased investment in veterinary education and training programs to enhance local capacities (FAO, 2023b). Collaborative efforts with international organizations could help establish scholarships or exchange programs that expose Yemeni veterinarians to advanced techniques and emerging research in their field. Furthermore, improving working conditions, offering competitive salaries, and providing incentives for veterinarians to work in rural areas will help attract more individuals to this vital profession. Only by adequately addressing this shortage can improve the animal health care system and ensure sustainable agricultural practices while safeguarding public health.

Limited Access to Veterinary Services

105. Limited access to veterinary services in Yemen is a critical and pressing issue that poses significant challenges to the livestock industry and overall animal welfare. With ongoing conflicts, economic instability, and infrastructure damage, the ability of farmers and livestock keepers to access adequate veterinary care has become severely restricted. This has had detrimental effects on the health and productivity of animals, leading to reduced milk production, lower meat quality, and increased susceptibility to diseases. Animal diseases pose threats to human health through zoonotic transmission (FAO, 2023b). The scarcity of veterinary professionals, lack of medical supplies and proper infrastructure exacerbate the problem further. To address this issue effectively, it is crucial for international organizations, non-governmental organizations (NGOs), and government agencies to collaborate with local stakeholders to invest in rebuilding veterinary infrastructure, establish mobile clinics, provide training programs for local veterinarians and technicians who can provide necessary preventive care to protect both the welfare of animals and public health, facilitate the importation of essential medicines and equipment, as well as support research initiatives aimed at enhancing the understanding of prevailing animal health issues in Yemen requires not only but also prioritizing training programs for local veterinarians.

Lack of essential equipment

106. The lack of essential equipment for veterinarians and veterinary laboratories poses a significant challenge to the provision of quality veterinary care and disease control measures in the country. The scarcity of vital equipment such as diagnostic tools, surgical instruments, and laboratory facilities severely hampers the ability to accurately diagnose illnesses, conduct surgeries, and effectively manage animal health. This results in limited treatment options, delayed interventions, and compromised animal welfare (FAO, 2023b). Without proper equipment for sample testing and analysis, accurate disease surveillance becomes nearly impossible, hindering efforts to detect and eradicate outbreaks promptly. The shortage of basic necessities further impedes the overall efficiency of veterinary practices. Addressing this critical issue requires targeted intervention from both local authorities and international organizations to ensure that veterinarians have access to the essential tools required for delivering effective healthcare services and safeguarding public health.

Reason of low production in animals

107. Livestock malnutrition and lack of vaccination in Yemen pose significant challenges to both the agricultural sector and public health. The ongoing conflict and economic crisis have severely disrupted the livestock industry, leading to a scarcity of resources such as feed, water, and veterinary care. As a result, many animals suffer from inadequate nutrition, making them more prone to diseases and infections. Without regular vaccinations, livestock and domestic animals are more susceptible to diseases, leading to increased mortality rates and decreased productivity. The absence of proper vaccination programs further exacerbates the situation as preventable diseases spread among herds, leading to heavy losses for farmers who heavily rely on livestock for their livelihoods (FAO, 2023b). The repercussions extend beyond the agricultural sector; malnourished animals can transmit diseases to humans through consumption or close contact. Addressing livestock malnutrition and implementing effective animal vaccination programs is crucial not only for the well-being of animals but also for safeguarding public health.

Quality control of activities

108. The veterinary services within the DGAR have no functioning system for quality control over activities that are implemented by the DGAR and its related departments and also over those veterinary services and activities offered by the private sector (FAO, 2023b). The DGAR, with the help of some donors such as World Bank being also part of ongoing project, is working out the Livestock Policies and strategies including those of veterinary services and animal husbandries.

Lack of awareness about the significance of veterinary care

109. There exists a concerning lack of awareness regarding the significance of veterinary care for animals and its impact on public health. The ongoing conflict has overshadowed the importance of supporting this crucial sector, leading to a decline in accessible and quality veterinary services. This dearth of awareness has severe consequences; not only does it compromise animal welfare, but it also poses risks to human health (FAO, 2023b). Without proper veterinary care, zoonotic diseases can spread unchecked from animals to humans, exacerbating public health crises. Many farmers and animal owners are unaware of the benefits of regular veterinary check-ups and preventive measures. Domesticated livestock play a vital role in the economy and food security; neglecting their healthcare needs jeopardizes agricultural output and negatively affects farmers' livelihoods. The ignorance surrounding veterinary care must be addressed urgently through strategic educational and awareness campaigns that emphasize its significance for both animal and human well-being. Only by raising awareness and prioritizing this neglected sector can Yemen foster healthier communities and ensure sustainable economic development.

Limited Resources

110. Insufficient funding for veterinary services, research, and infrastructure exacerbates the challenges faced in this sector. There are no funds allocated for operations of the GDAHVQ to match the basic needs associated with their mandates and there is no contingency fund easily accessible that

could be used in case of a disease emergency to ensure efficient early warning and response (*FAO, 2023b*). Yemen faces numerous challenges in allocating sufficient financial resources to its animal health sector (Al – Mamari, 2008; Ministry of Agriculture and Irrigation/Directorate of Animal Health and Veterinary Quarantine – DAHVQ, *n.d.*). Limited funding hampers the ability to implement vital programs such as disease surveillance, vaccination campaigns, and capacity building initiatives. According to the World Organization for Animal Health (WOAH), Yemen's government expenditure on animal health has been consistently low in recent years, hovering around 0.5% of the national budget. This is significantly below the recommended benchmark of 3-5% set by the WOAH funded as OIE, reflecting the insufficient priority given to the sector. Insufficient funding has serious consequences, including inadequate veterinary services, limited access to vaccines and medicines, and an increased risk of disease outbreaks (The World Organization for Animal Health (WOAH), 2009).

3.8 Crosscutting Issues

111. **Environmental issues in animal health are crosscutting issue that will be addressed in all areas of the strategy.** It is essential to adopt a One Health approach that involves collaboration among different sectors and disciplines, such as public health, veterinary medicine, environmental science, agriculture, wildlife management, and social sciences. A One Health approach can help to identify the root causes and drivers of environmental problems, assess the impacts and risks on animal and human health, design and implement integrated and sustainable solutions, and monitor and evaluate the outcomes and impacts. Some of the environmental issues that are relevant are biodiversity loss that can reduce the resilience and stability of ecosystems, as well as the provision of ecosystem services that support animal and human health. Biodiversity loss can also increase the risk of disease emergence and spillover, as it can reduce the buffer effect of wildlife diversity on pathogen transmission. Land use change can alter the interactions among humans, animals, and the environment, creating new opportunities for disease transmission and exposure. Land use change can also degrade the quality and quantity of natural habitats for wildlife and livestock, leading to increased competition, conflict, and stress.

112. **Climate change poses significant challenges for animal health in Yemen**. Rising temperatures and prolonged droughts have accelerated the spread of infectious diseases among animals, leading to increased mortality rates and reduced productivity in livestock. The limited access to clean water and suitable forage exacerbates these issues, as it weakens the animals' immune systems and leaves them vulnerable to diseases. Changing weather patterns have disrupted traditional grazing practices, forcing herders to gradually abandon their ancestral territories and expose their livestock to new pathogens. The scarcity of resources has pushed farmers to overgraze certain areas, further degrading soil quality and exacerbating the cycle of desertification.

113. In recent years, Yemen has witnessed a troubling trend of above-normal rainfall in certain regions, leading to devastating floods that have had severe consequences on the country's infrastructure and population. Floods often resulted in the destruction of homes and displacement of communities, exacerbating existing humanitarian crises in Yemen. The risk of Rift Valley Fever re-emerging due to these climate conditions for the vectors in Yemen is a matter of concern for public health professionals.

The floods provide an ideal environment for these vectors to thrive, with its warm climate, stagnant water bodies resulting from inadequate sanitation systems, and large populations of livestock that act as amplifying hosts. Changing weather patterns have led to overcrowding of domesticated animals, enhancing virus transmission. The already fragile healthcare system in Yemen could be overwhelmed by an RVF outbreak, as seen during previous outbreaks in East Africa.

114. Climate change is not only impacting the availability of resources for animals in Yemen, but it is also indirectly contributing to the increased use of antimicrobials in the livestock industry. As animals become more susceptible to diseases and parasites due to a compromised immune system caused by climate-related stressors, farmers often resort to using antimicrobials as a quick solution. This overreliance on antimicrobials not only exacerbates the development of antimicrobial resistance but also poses a threat to human health through the consumption of contaminated animal products. These complex challenges demand a multi-faceted approach that integrates climate change adaptation strategies into animal health systems while promoting sustainable land management practices. There is a pressing need for a more comprehensive approach to animal health that focuses on sustainable animal production systems and responsible antimicrobial use. The implementation of early warning systems, vaccination campaigns, improved veterinary services, and the adoption of resilient livestock breeds will be crucial in mitigating the impact of climate change on animal health.

115. **Antimicrobial resistance has become a pressing global health concern and a concern in Yemen, too**. The misuse and overuse of antibiotics in livestock, particularly in the poultry and dairy sectors, has contributed to the emergence of resistant bacteria that pose a threat to animals as well as humans. Yemen's limited veterinary infrastructure and poor regulatory enforcement further exacerbate the problem, as there is inadequate monitoring of antibiotic usage and substandard hygiene practices in animal production systems. This has fueled the rise of drug-resistant bacterial infections in animals, leading to increased mortality rates, reduced productivity, and compromised welfare. The spread of AMR from animals to humans through direct contact or consumption of contaminated products adds an additional layer of concern for public health. This situation is exacerbated by the ongoing conflict, which has disrupted healthcare systems and further limited access to appropriate treatment and prevention measures. The causes of AMR in Yemen are multifaceted, stemming from inadequate healthcare infrastructure, limited access to essential medicines, and weak infection prevention and control measures. The consequences of antimicrobial resistance are severe, as it leads to increased morbidity, mortality, longer hospital stays, greater healthcare costs, and limited treatment options for infectious diseases. It poses a threat to public health security globally as resistant bacteria can easily spread across borders. Addressing this issue requires a comprehensive approach that involves raising awareness about proper antibiotic use, strengthening healthcare infrastructure, promoting responsible antibiotic use, enhancing infection prevention measures, enhancing veterinary services and surveillance systems, implementing strict regulations, raising awareness among farmers and healthcare providers are urgently needed to combat AMR and protect animal wellbeing in Yemen.

116. **The state of biosecurity in animal health in Yemen faces significant challenges** Before the conflict, Yemen had established several biosecurity measures to protect the livestock industry. These measures included disease surveillance, vaccination programs, quarantine facilities, and strict import regulations. The government, in collaboration with international organizations like the Food and

Agriculture Organization (FAO) and the World Organization for Animal Health (WOAH), aimed to prevent the introduction and spread of infectious diseases among livestock.

117. Disease surveillance was a crucial component of biosecurity in Yemen. The Ministry of Agriculture and Irrigation, along with veterinary professionals, actively monitored livestock for signs of diseases such as foot-and-mouth disease, brucellosis, and avian influenza. Surveillance activities involved regular inspections, sample collection, laboratory testing, and reporting of any outbreaks. These efforts helped in early detection and quick response to potential disease threats.

118. Vaccination programs were another key aspect of biosecurity in Yemen. The government, with the support of international organizations, implemented vaccination campaigns to immunize livestock against prevalent diseases. Vaccines for diseases like Rift Valley Fever, Peste des Petits Ruminants, and Newcastle Disease were administered to prevent widespread outbreaks. These programs significantly reduced the incidence of diseases and contributed to the overall health of the livestock population.

119. The presence of well-equipped quarantine facilities was essential to prevent the introduction of diseases through imported livestock. Yemen enforced strict regulations and quarantine protocols at ports of entry to control the movement of animals. Imported livestock were subjected to thorough health checks, isolation periods, and testing before being allowed into the country. This stringent system ensured that potential disease carriers were identified and prevented from entering the local livestock population.

120. To maintain biosecurity standards, Yemen imposed strict regulations on the import of livestock and animal products. These regulations aimed to avoid the introduction of exotic diseases and protect the domestic livestock industry. The government set specific criteria for importing livestock, including health certificates, vaccination records, and compliance with international animal health standards. These regulations contributed to maintaining the health and integrity of Yemen's livestock population.

121. Despite the pre-conflict efforts in biosecurity, Yemen faced several challenges. Limited resources, inadequate infrastructure, and a lack of awareness among livestock owners hindered the effective implementation of biosecurity measures. Additionally, the country's geographic location and proximity to disease-prone regions acted as potential risk factors for disease outbreaks. The ongoing conflict in Yemen has had a devastating impact on the biosecurity of livestock. The breakdown of governance and the destruction of infrastructure have severely compromised disease surveillance, vaccination programs, quarantine facilities, and import regulations. As a result, livestock diseases have proliferated, leading to increased mortality rates, reduced productivity, and compromised food security.

122. Despite the challenging circumstances, Yemen has made commendable efforts to address biosecurity concerns in livestock farming. The Ministry of Agriculture and Irrigation, in collaboration with international organizations such as the Food and Agriculture Organization, has implemented several initiatives. These include training programs to enhance the knowledge and skills of veterinary professionals, the establishment of veterinary laboratories for disease surveillance, and the provision of vaccines and medicines to combat livestock diseases. Moreover, the government has initiated public awareness campaigns, educating farmers about biosecurity protocols and preventive measures.

123. Extensive research has been conducted to assess the impact of biosecurity measures in Yemen's livestock sector post-2020. A study by Al-Bana et al. (2021) analyzed disease prevalence and identified

the major challenges faced in implementing biosecurity measures. The research highlighted the need for improved infrastructure, enhanced coordination between stakeholders, and increased investment in research and development. A survey conducted by the University of Sana'a revealed that only 40% of livestock farmers have adequate knowledge of biosecurity practices, emphasizing the urgent need for comprehensive training programs.

124. To enhance the status of biosecurity in livestock farming post-2020, several recommendations can be considered. Strengthening the veterinary infrastructure is crucial, with a focus on establishing well-equipped veterinary clinics and laboratories across the country. The continuous professional development programmes as well are important to ensure that veterinarians, para-veterinarians and community-based animal health workers (CAHWs) have the necessary skills and competencies. This would facilitate disease diagnosis, surveillance, and timely intervention. Fostering collaboration between government agencies, veterinary professionals, and farmers is essential to ensure effective coordination and information sharing. Regular meetings and workshops should be organized to exchange knowledge and experiences related to biosecurity practices. Increasing investment in research and development is vital for developing locally appropriate solutions for livestock diseases prevalent in Yemen. Expanding educational programs on biosecurity for livestock farmers is imperative. The government should allocate resources to conduct comprehensive training sessions, covering topics such as quarantine procedures, proper hygiene practices, and vaccination protocols. These programs should be accessible to all professionals, including those in remote areas, through the establishment of mobile training units or the use of digital platforms.

125. **There are significant gender equity issues that need to be addressed**. In rural communities, women play important roles in food production and household nutrition but are disadvantaged in terms of access to resources, level of education, membership of cooperatives, and participation in household and community decision-making processes. Gender mainstreaming efforts are included in various sectoral programmes but are not progressing as fast as expected. Gender mainstreaming needs to be strengthened and expedited in order to increase the benefit obtained from rural labor (men and women) and enhance value addition in the agricultural sector. Gender imbalances also need to be addressed at all levels of the institutional framework.

4. APPROACH TO THE DEVELOPMENT OF THE ANIMAL HEALTH STRATEGY

4.1 Key documents highlighting critical issues at Global and Regional level

126. The proposed Strategy is at global and regional level in line with the ***(1) Integrated Action Plan for the Prevention, Control and Pandemic Preparedness against Avian and Human Influenza (World Bank, 2007)*** developed by the World Bank in collaboration with other partners, such as the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the World Organisation for Animal Health (WOAH) and the United Nations System Influenza Coordination (UNSIC). The plan aims

to promote a coordinated, multisectoral and evidence-based approach to address the complex and evolving challenge of avian and human influenza. It is intended to complement and support other existing initiatives and frameworks, such as the Global Influenza Strategy 2019–2030, the National Strategic Plan for Prevention and Control of Avian Influenza and Human Influenza Pandemic Preparedness and Response, and the National Pandemic Strategy.

127. ***(2) The Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs)*** is a joint initiative of the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (WOAH), with the expected participation of the World Health Organization (WHO) for the zoonoses. It is a facilitating mechanism meant to empower countries and regional alliances in the fight against transboundary animal diseases (TADs), to provide capacity building and to assist in establishing programmes for the specific control of certain TADs based on regional priorities. The GF-TADs aims to prevent, detect and control transboundary animal diseases (TADs), and in particular to address their original and global dimensions; to strengthen the capacity of countries and regional alliances to control TADs; to promote coordination and collaboration between countries and regional alliances in the fight against TADs; to mobilize resources to support the control of TADs. The GF-TADs is an important tool for the global community in the fight against TADs. It provides a framework for countries and regional alliances to work together to prevent, detect and control these diseases.

128. ***(3) The GF-TADs Strategy for 2021 – 2025*** that outlines the vision, mission, objectives and activities of the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) for the next five years. The GF-TADs is a coordination mechanism between the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (WOAH) to reduce the threats from transboundary animal diseases (TADs) on food security, livelihoods and safe trade[1]. It aims to enhance the control of TADs through three main objectives: (a) Establish strategies for priority TADs at the sub-regional, regional and global level; (b) Develop and maintain capacities to prevent and control TADs; and (c) Improve sustainability of strategies to control priority TADs through multi-disciplinary partnerships.

129. The Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) has devised a comprehensive strategy tailored specifically for the Middle East region ***(4) The GF-TADs Strategy for the Middle East***. The primary objective of the GF-TADs strategy for the Middle East is to enhance the prevention, control, and eventual eradication of transboundary animal diseases that pose a significant threat to the region's livestock industry. By fostering collaboration among countries in the Middle East, the GF-TADs strategy aims to improve the region's ability to detect, respond to, and recover from TAD outbreaks effectively. Ultimately, this strategy strives to ensure food security, safeguard public health, and promote regional trade by maintaining the health and productivity of livestock populations. Key Components of the GF-TADs Strategy: 1. Strengthening Veterinary Services, 2. Enhancing Veterinary Legislation and Standards, 3. Promoting Research and Development.

130. ***(5) The Progressive Control Pathway for Foot and Mouth Disease (PCP-FMD)***. Developed by FAO and EuFMD and endorsed by the WOAH, is a risk and evidence-based framework to guide endemic countries to progressively improve the management of FMD risks and reduce disease impacts and viral circulation. As countries advance through the PCP-FMD, the FMD risks are mitigated to the point where an application to the WOAH for official recognition of freedom from FMD (with or without

vaccination) may be successful and sustainable. The PCP-FMD is one of the core tools of the Global FMD Control Strategy, along with the WOAH Performance of Veterinary Services Pathway (PVS). The PCP-FMD recognizes that differences in risk of infection occur between (and within) infected countries, and that endemic countries are at different stages in managing the risk of infection. The PCP-FMD supports the implementation of risk-based approaches in which each country is encouraged to develop national risk reduction strategies, not only for the benefit of the country but also the region. The PCP-FMD consists of two distinct domains: (i) a Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) pathway from Stage 0 up to and including Stage 3 and (ii) and a WOAH pathway beyond Stage 3.

131. ***(6) The Global Strategy for the Control and Eradication of PPR***, a joint initiative by the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (WOAH) to eliminate Peste des Petits Ruminants (PPR) by 2030[3]. It is based on four stages that combine decreasing levels of epidemiological risk with increasing levels of prevention and control. It also aims to strengthen the veterinary services of the affected countries, as well as to control other priority diseases of small ruminants, such as foot-and-mouth disease, sheep and goat pox, and Rift Valley fever[2]. The strategy involves a multi-country, multi-stage process that requires close collaboration and coordination among national, regional, and international stakeholders.

132. ***(7) The Tripartite Guide to Addressing Zoonotic Diseases in Countries***. Zoonotic diseases, also known as zoonoses, are infectious diseases that can be transmitted between animals and humans. These diseases pose a significant threat to global public health, as they can cause major outbreaks and pandemics. In response to this growing concern, the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), and the World Organisation for Animal Health (WOAH) collaborated to develop the Tripartite Guide to Addressing Zoonotic Diseases in Countries. By adopting a One Health approach, enhancing surveillance systems, conducting risk assessments, building capacity, and promoting collaboration, countries can effectively address the complex challenges presented by zoonotic diseases. Embracing the principles outlined in this guide is paramount in safeguarding global public health and promoting a more resilient and proactive approach to zoonotic disease control.

133. ***(8) The One Health Joint Plan of Action 2022-26***, a collaborative initiative by four international organizations: the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO), and the World Organisation for Animal Health (WOAH, founded as OIE). It aims to create a framework to integrate systems and capacity so that we can collectively better prevent, predict, detect, and respond to health threats at the human-animal-plant-environment interface. It focuses on supporting and expanding capacities in six areas: One Health capacities for health systems, emerging and re-emerging zoonotic epidemics, endemic zoonotic, neglected tropical and vector-borne diseases, food safety risks, antimicrobial resistance and the environment.

134. ***(9) The FAO Strategic Action Plan on One Health (OH JPA)*** is a framework for action that guides the FAO and its partners in implementing the One Health approach. The One Health approach is a collaborative, multisectoral, and transdisciplinary approach to addressing complex health challenges that arise at the intersection of human, animal, and environmental health. The OH JPA has four main objectives: To strengthen governance and coordination for One Health. To improve surveillance and

early warning systems for One Health. To reduce risks at the human-animal-environment interface. To enhance capacity for preparedness and response to One Health threats. The OH JPA includes several specific activities and targets, such as: Developing and implementing national One Health action plans. Strengthening surveillance and monitoring of zoonotic diseases and other One Health threats. Promoting the responsible use of antimicrobials in food and agriculture. Investing in research and development of new tools and approaches for One Health. Raising awareness of One Health among the public and stakeholders. The OH JPA is a valuable resource for countries and partners that are committed to implementing the One Health approach. It provides a roadmap for how to work together to address complex health challenges and protect human, animal, and environmental health.

135. The document ***(10) One Health operational framework for action for the Eastern Mediterranean Region, focusing on zoonotic diseases*** is a guide developed by the World Health Organization (WHO) Regional Office for the Eastern Mediterranean to help countries in the region implement the One Health approach to addressing zoonotic diseases. The framework for action provides countries with a list of practical key activities that they can take to implement the One Health approach to zoonotic diseases. These activities are grouped into four main categories: Strengthening governance and coordination, improving surveillance and early warning systems, Reducing risks at the human-animal-environment interface, Enhancing capacity for preparedness and response. The framework for action also emphasizes the importance of communication and engagement to the successful implementation of the One Health approach.

136. The document ***(11) A guide to implementing the One Health Joint Plan of Action at national level*** is a guide to implementing the One Health Joint Plan of Action (OH JPA) at national level provides practical guidance on how countries can adopt and adapt the OH JPA to strengthen and support national One Health action. Building on the OH Joint Plan of Action theory of change, this Guide describes three pathways and five key steps to implement the OH JPA at national level:

- Pathway 1 – Governance, policy, legislation, financing and advocacy
- Pathway 2 – Organizational and institutional development, implementation and sectoral integration
- Pathway 3 – Data, evidence, information systems and knowledge exchange.

The Guide is a joint publication by the four Quadripartite organizations, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO), and the World Organisation for Animal Health (WOAH).

137. Document ***(12) The FAO Action Plan on Antimicrobial Resistance (AMR) 2021-2025*** is a comprehensive plan that aims to reduce the global burden of AMR focusing agrifood systems. The plan was developed by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with other international organizations, including the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH). The plan has five strategic objectives: increasing stakeholder awareness and engagement; strengthening surveillance and research; enabling good practices; promoting responsible use of antimicrobials; and strengthening governance and allocating resources sustainably. The plan includes a number of specific activities and targets, such as: Strengthening surveillance and monitoring of AMR in food and agriculture. Promoting the responsible use of antimicrobials in food and agriculture. Investing in research and development of

new antimicrobials and alternatives. Raising awareness of AMR among farmers, veterinarians, and other stakeholders in food and agriculture. Under the framework of the plan, FAO is launching a global initiative to Reducing the need for antimicrobials in agrifood systems (RENOFARM), which is a ten-year global initiative that contributes toward countries' agrifood systems transformation through the provision of comprehensive support in the implementation of good production practices that lead to a reduced need for antimicrobials and to a prudent and responsible use when antimicrobials are needed.

138. Document ***(13) The FAO Progressive Management Pathway for Terrestrial Animal Biosecurity[1] -*** FAO-PMP-TAB is a collaborative, stepwise approach to assessing and managing biological risks in livestock value chains, supported by the provision of appropriate tools with shared public-private responsibilities. It includes planning of policies, laws, regulations, institutional framework, guidelines and field interventions. The development of sustainable biosecurity management systems in terrestrial animals ultimately contributes to One Health and ultimately benefit people, animals, and ecosystems. FAO-PMP-TAB implementation results in reduced burden and impact of animal diseases (including zoonoses), reduced transboundary spread of diseases, improved socioeconomic benefits in the terrestrial animal sectors, reduced antimicrobial resistance and, ultimately, enhanced One Health outcomes.

139. The purpose of the document ***(14) Control of contagious bovine pleuropneumonia – A policy for coordinated actions*** is to provide an evidence-based policy for the implementation of sound control of CBPP by all stakeholders at all levels – global, regional and national. It describes a road map to CBPP control that is cognizant of the situation on the ground. While not being prescriptive, the document includes examples of combinations of interventions and control measures that should offer the opportunity to improve impact and hence offer better livelihoods to livestock producers.

140. In the Note ***(15) Livestock in protracted crises, the importance of livestock for resilience-building and food security of crisis-affected populations*** focuses on the topic of livestock in protracted crises, presenting the challenges and some possible solutions, illustrated by case studies from FAO interventions in such contexts. Protracted crises are one of the most challenging contexts in which to fight hunger, malnutrition and poverty. In such contexts, protecting, saving and rebuilding agricultural livelihoods to save lives and create the conditions for longer-term resilience is a key step towards ensuring peace and stability. However, the role of the agriculture sector in crisis situations is too often overlooked and the necessary investments not made. Livestock contribute 40 % of the global value of agricultural output and support the livelihoods and food security of almost 1.3 billion people. Beyond their direct role in generating food and income, livestock are a valuable asset, serving as a store of wealth, collateral for credit and an essential safety net during times of crisis. Livestock-based interventions, using a combination of humanitarian and development approaches, can have a significant impact in strengthening the resilience of livelihoods depending on animal husbandry.

141. Those documents have some common objectives, such as: (a) Strengthening the capacity of animal and human health systems to prevent, detect and respond to outbreaks of these diseases; (b) Promoting collaboration and coordination among different sectors, disciplines and stakeholders at national, regional and global levels; (c) Supporting the implementation of international standards and

guidelines for animal health and welfare, biosecurity, surveillance, diagnosis, vaccination and compensation; (d) Enhancing the awareness and engagement of communities, farmers, consumers and other relevant actors in the prevention and control of these diseases; (e) Mobilizing resources and ensuring effective and transparent allocation and utilization of funds. Some of these initiatives are more specific to certain diseases or regions, while others are more comprehensive and holistic.

4.2 Key documents highlighting critical issues at National level

Policies and strategies

142. At national level, The Yemeni government has developed a range of policies and strategies to support the development of the livestock sector. ***The National Livestock Program***, in collaboration with international organizations, aims to enhance disease surveillance, improve veterinary capacity, and provide vaccinations against prevalent diseases like Foot and Mouth Disease (FMD) and Rift Valley Fever (RVF). These programs not only protect animal health but also contribute to public health by preventing the spread of zoonotic diseases.

143. Those are laid by the ***Yemen Animal Health Report 2020 by the Ministry of Agriculture and Irrigation***, it is a comprehensive report, published annually, and provides a holistic overview of the current state of animal health in Yemen. It highlights key issues such as the prevalence of infectious diseases, inadequate veterinary infrastructure, and limited access to quality animal healthcare. The report emphasizes the need for increased funding, training, and international support to tackle these challenges effectively *(Ministry of Agriculture and Irrigation, 2023)*. ***The National Agriculture Sector Strategy 2012-2016 and the updated version (2024 – 2030)*** that include a Development Policy for Animal Production, as well as General Policies for Animal Health and Veterinary Quarantine. The overall objective is to reduce mortality and reduce the spread of livestock diseases through preventive programs and to provide quality veterinary services for the treatment of animal diseases to protect human being from common diseases and to ensure the quality and safety of animal products *(FAOLEX Database, 2012).*

144. ***The Impact of Conflict on Animal Health in Yemen by the World Organization for Animal Health (WOAH)***. This document focuses on the devastating impact of the ongoing conflict on the animal health sector in Yemen. It highlights the alarming increase in zoonotic diseases, the disruption of vaccination campaigns, and the destruction of veterinary facilities. The report emphasizes the urgent need for humanitarian aid, as well as the importance of rebuilding infrastructure to prevent further deterioration of animal health. The ***Livestock and Animal Health in Yemen: Challenges and Opportunities" by the Food and Agriculture Organization (FAO)***. This publication sheds light on the challenges faced by livestock farmers in Yemen and their implications on animal health. It identifies key issues such as limited access to animal feed, water scarcity, and the lack of skilled livestock professionals. The report proposes strategies to enhance livestock productivity, improve animal welfare, and ultimately boost the livelihoods of farmers.

145. ***The National Contingency Plan for Rinderpest (NCPR-Yemen) 2009***, is a plan that has been developed to guide the Yemeni government and its partners in the event of an outbreak of rinderpest in the country. The NCPR-Yemen is based on the following principles: Early detection and response,

Containment and control, Eradication. The NCPR-Yemen includes a number of specific activities and targets, such as: surveillance and reporting; rapid response; quarantine and control; vaccination; and awareness raising. The NCPR-Yemen is a comprehensive plan that has been developed to guide the Yemeni government and its partners in the event of an outbreak of rinderpest in the country. The post-eradication efforts of rinderpest in Yemen have been successful in preventing the re-emergence of the disease. The country has maintained its rinderpest-free status for over 15 years. However, it is important to continue surveillance and monitoring efforts to ensure that rinderpest does not re-emerge in the future. ***The Performance of Veterinary Services (WOAH 2007, 2014)*** that mention the performance of veterinary services in Yemen, based on the WOAH PVS Pathway. The PVS Pathway is a tool that helps to evaluate, plan, and improve the quality of national veterinary services and aquatic animal health services.

146. Other sectoral strategies and policies are key to realizing the objectives of the animal health sector, which must also be acknowledged. These include:

- ***The National Agriculture Sector Strategy and Investment Plan for Yemen***
- ***The Yemen Multisectoral Nutrition Action Plan***
- ***Republic of Yemen Agriculture Sector Study: Strategy for Sustainable Agricultural Production***
- ***Yemen Plan of Action 2018–2020, Strengthening resilient agricultural livelihoods***
- ***National Water Sector Strategy and Investment Program***

Guidelines and Tools

147. Animal health Thematic Documents that deal with important topical issues related to animal health and welfare have also been produced. Those are the ***Sustainable Livestock Guide***; the new version of this web-based platform is both a practical instrument and an information resource for developing sustainable livestock production systems. The Investing in Sustainable Livestock Guide provides guidance needed to ensure livestock projects are sustainable according to environmental and animal health dimensions. It includes principles for environment and animal health in the livestock sector, as well as explanations of the production contexts the guidance is built around. The ***Livestock Sector Investment and Policy Toolkit (LSIPT) Making Responsible Decisions***. The Food and Agriculture Organization of the United Nations (FAO), together with the World Bank, the International Livestock Research Institute (ILRI) and the Agricultural Research Centre for International Development (CIRAD), have developed the LSIPT toolkit to support teams and decision-makers to increase and improve policies and livestock investments that contribute to achieving the Sustainable Development Goals. The objective is to increase public (and private) investment in the livestock sector by giving decision-makers the evidence they need to make strategic choices and attract investment.

148. ***The Livestock movement and Trade (USAID, 2008)*** that proposes concrete actions to develop a formal, organized marketing structure and improve production efficiencies through the Livestock Sale Barn Program (LSB). This program links the producer, trader, consumer, and export market as well as improve health, nutrition, veterinary services, and supplies. It also includes providing training

programs through private extension courses for health and nutrition, and distribution of information regarding proper animal husbandry practices for the small farmers/producers and traders.

Legislation

149. The legislative framework governing animal health in Yemen primarily revolves around ***the Law on Animal Health***, which was established in 1983 (FAOLEX Database, 2004). This law focuses on controlling and preventing the spread of diseases among animals, ensuring the safety of animal products, and safeguarding public health. Various other regulations and decrees have been enacted over the years to address specific concerns, such as preventing the illegal importation of animals and ensuring the welfare of animals during transportation. ***Resolution No. 99 of 2001*** regulating the veterinary quarantine that was issued on 31 March 2001 by the Ministry of Agriculture and Irrigation. It contains 16 articles that define the terms and conditions for the introduction or taking out of animal consignments, the control and inspection of animals, the establishment and management of veterinary quarantine stations, the fees, and fines for violating the resolution, and other related matters. The resolution aims to protect the animal health and prevent the spread of diseases in Yemen.

150. ***Law No. 17 of 2004 regulating and protecting the animal wealth*** that aims to organize and protect the animal resources in the country, including livestock, wild animals, birds, bees, and silkworms. It also provides for veterinary health measures to prevent and control animal diseases and ensure the safety of animal products. The law is composed of seven sections and 61 articles, covering topics such as definitions, objectives, livestock production and investment, hunting, zoos, veterinary medicine, quarantine, and penalties. The law was implemented by a Prime Minister Resolution in 2005, which issued the regulation on the law. The ***SPS-Law No. 17 "On the Organization and Protection of Livestock" dated 22 August 2004*** that regulates the activities related to livestock production, protection, health, and trade in Yemen. It aims to ensure the quality and safety of livestock products, prevent the spread of animal diseases, and protect the environment and public health. The law consists of 10 chapters and 64 articles that cover various aspects of livestock management, such as registration, licensing, quarantine, vaccination, inspection, slaughter, import and export, penalties, and dispute resolution. The law was issued by the President of the Republic of Yemen on 22 August 2004 and published in the Official Gazette on 30 August 2004. It entered into force on the date of its publication. The law replaced the previous Law No. 38 of 1992 on the Control of Food and its Circulation. The law is one of the main legal instruments that Yemen has adopted to comply with the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) of the World Trade Organization (WTO), which Yemen joined in 2014.

151. ***The SPS-Law No.794:2004 "On Requirements for Animal Slaughtering, in Accordance with the Provisions of Islamic Sharia"*** was issued by the Ministry of Agriculture and Irrigation of Yemen on 14/12/2004. It aims to regulate the slaughtering of animals for human consumption in accordance with the Islamic Sharia principles. The ***Prime Minister Resolution of 2005 issuing the regulation on Law No. 17 of 2004 regulating and protecting the animal wealth***. The resolution was issued by the Prime Minister of Yemen in 2005 to implement the Law No. 17 of 2004 regulating and protecting the animal wealth. The resolution covers various aspects of animal production, health, quarantine, and protection. It also defines the roles and responsibilities of the Ministry of Agriculture and Irrigation,

the veterinary authorities, and other relevant institutions. The resolution aims to ensure the safety and quality of animal products, prevent and control animal diseases, promote animal welfare, conserve wildlife and biodiversity, and encourage investment in the livestock sector.

152. ***The Law No.5 of 2011 amending article 50 of Law No.17 of 2004 regulating and protecting the Animal Wealth*** consisting of 2 articles aims at amending article 50 regarding the fees for the services provided by the Ministry in the field of livestock and sets the amounts, in particular it concerns (i) fees for establishment licenses and practicing the profession; and (ii) veterinary health certificates issuance fees and import permits. ***The Agreement on Cooperation between the Government of the Democratic and Popular Republic of Algeria and the Republic of Yemen in the field of animal health***. By this Convention, the two Parties undertake to strengthen cooperation between the veterinary services of the two countries (the Specialized Administration); facilitate trade in animals, animal products and their derivatives and/or products of animal origin; protect their respective territories from possible epidemics, parasitic diseases of animals and common or transmissible zoonoses to humans and animals and public health and the environment. ***The Agreement on the Application of Sanitary and Phytosanitary Measures (the "SPS Agreement")*** entered into force with the establishment of the World Trade Organization (WTO) on 1 January 1995. It concerns the application of food safety and animal and plant health regulations. The Yemen Ministry of Trade and Industry has prepared this text to assist public understanding of the SPS Agreement. It is not intended to provide a legal interpretation of the WTO agreement *(FAOLEX Database, 2004)*.

153. The aforementioned documents provide critical insights into the challenges faced by animal health in Yemen. They highlight several common themes:

- ***Limited Resources and Infrastructure****:* A recurring issue across all documents is the scarcity of resources and inadequate infrastructure for animal healthcare. Yemen's ongoing conflict has severely depleted funding and has led to the destruction of veterinary facilities, hindering the provision of essential services.
- ***Zoonotic Diseases and Public Health****:* The reports emphasize the surge in zoonotic diseases due to the conflict and the lack of adequate disease surveillance systems. This poses a significant threat to public health, as diseases can easily spread from animals to humans.
- ***Livestock Productivity and Food Security****:* The impact of animal health issues on livestock productivity and food security is a pressing concern. With limited access to animal feed and water, farmers struggle to maintain healthy livestock populations, leading to decreased agricultural productivity and food insecurity.

154. The successful implementation of the YAHSIP is paramount for ensuring the country's welfare and future development. By addressing the identified challenges, fostering cooperation, and incorporating innovative approaches, Yemen has the potential to enhance animal health practices and promote sustainable and resilient strategies. This will not only lead to improved food security and economic stability but will also contribute to the overall well-being of both animals and humans in Yemen. The following steps have been taken to develop the Strategy:

- Identification of the Interventions (outputs) and related priority activities leading to the achievement of the 23 Expected Results from achieving the five (5) Strategic Priorities

- Presentation to the Stakeholder meetings in October and November 2023
- Once consensus is reached on the interventions and the priority activities, present the YAHSIP to the development partners and all the stakeholders through a suitable Platform in the form of:
    - Donor meetings seeking support of upstream interventions aiming to create the capacities and enabling environments to implement the YAHSIP (capacity development, training, workshops, basic infrastructure, etc. (building on activities that have already been identified for implementation)
    - Business meetings for financing investment interventions by public and private investors.

4.3 Analysis of strengths, weaknesses, opportunities, and threats (SWOT analysis)

155. A comprehensive analysis of the strengths, weaknesses, opportunities, and threats in animal health in Yemen highlights the need for urgent and concerted efforts to address the existing challenges. By leveraging its strengths, such as its diverse animal species and traditional knowledge, and capitalizing on opportunities, such as technological advancements and collaboration, Yemen can overcome weaknesses and mitigate threats to improve animal health. However, it is essential to prioritize the rebuilding of veterinary infrastructure and services, enhance awareness among livestock owners, and strengthen surveillance and control measures to ensure the well-being of animals in Yemen.

Table 4: Analysis of strengths, weaknesses, opportunities, and threats

Strengths	Opportunities
• Share of livestock in total Agriculture • Milk production is an important source of income and nutrition for many farmers. • Donor agencies' willingness • Traditional knowledge and practices to enhance animal health management. • Farmers have extensive knowledge and experience in livestock. • Halal Meat market/products • Home to esteemed veterinary institutions. • Robust and resilient livestock sector	• Opportunity to improve animal health practices and disease control. • Progressive biosecurity management in livestock value chains • Can develop sustainable and context-specific animal health practices. • Collaboration to align animal health practices with global standards. • Supportive Government policies • Demand for value addition products • Halal Market concept • Awareness of Investors towards livestock business • Import-export of animals allowed. • Leveraging advancements in technology and telemedicine

Weaknesses	Threats
• FMD, PPR, and brucellosis • Limited access to veterinary services • Inadequate veterinary infrastructure • Poor Animal Nutrition • Shortages of veterinary staff and inputs • Under-capacity delivery services • Delivery of poor diagnostic services • No disease surveillance • Lack of information on animal movement & and their traceability • No Biosafety standards • Weak enforcement of Laws • Poor disease control strategy	• Ongoing political instability and conflict • Climate change has significant impacts on livestock production and animal health. • Lack of a regulatory and legislative framework for animal health • Endemics, epidemics and zoonotics • Food Security • Bio-Security • Shortage of quality medicine • Risk of transboundary animal diseases (TADs)

5. THEORY OF CHANGE

5.1 Rationale

156. The government of Yemen is in dire need of implementing an animal health strategy to address the pressing issues surrounding animal welfare and disease control within the country. The absence of a comprehensive animal health strategy has led to a lack of effective disease prevention measures, resulting in frequent outbreaks that have devastating economic consequences for farmers and threaten public health. Urgent action is required to address this pressing issue and catalyze positive change within the livestock sector.

157. The FAO, recognizing the crucial role of animal health in ensuring food security and sustainable agriculture, has developed a comprehensive set of strategies to address this issue. With particular reference to zoonotic diseases and emerging infectious diseases that pose significant threats to both animal and human populations, the organization emphasizes the importance of early warning systems and rapid response systems. By strengthening veterinary services and surveillance programs, the FAO aims to enhance disease monitoring capabilities and epidemiological intelligence. The FAO also places great emphasis on fostering international collaboration through sharing knowledge, expertise, and resources among countries to collectively build resilient animal health systems *(FAO, 2017; FAO 2020)*. This multi-pronged approach demonstrates the organization's commitment to safeguarding global public health and food safety by addressing potential risks at their root causes.

158. The Yemen Food Security Response and Resilience Project (FSRRP), which is funded by the World Bank, provides training and technical assistance for improved animal health service delivery *(World Bank, 2023)*. This includes enhancing the skills and knowledge of veterinary professionals and livestock owners on best practices in animal health management. The World Bank promotes the One Health approach, which recognizes the interconnectedness of human, animal, and environmental health. The

World Bank has been placing a strong emphasis on the importance of enhancing animal health and welfare in Yemen and is actively supporting programs that aim to improve veterinary care, strengthen disease surveillance mechanisms, enhance livestock production practices, and provide training for farmers. These initiatives not only address immediate concerns but also contribute to building resilience within the livestock sector against future shocks such as climate change or disease outbreaks. By prioritizing animal health and welfare enhancement measures, the World Bank demonstrates its commitment to sustainable development and empowering local communities through improved livelihoods.

159. Under the FSRRP project, FAO has the primary responsibility to lead the implementation of activities to increase domestic food production and market development, capacity building for food security management and building the technical and personnel capacities of the relevant public and community-based agriculture, livestock, and fishery institutions in Yemen. There is currently a lack of an agreed National Animal Health Strategy to guide development activities for the animal health sector in Yemen. To address some of the critical challenges of the livestock sector, it is necessary to develop a national animal health strategy to enable coordination between institutions, and support institutions, to increase livestock productivity and production in a sustainable manner, while protecting the environment, preserving animal biodiversity, ensure biosecurity and farmers' livelihood, facilitate better inter-state coordination in control of animal diseases (many of which are zoonotic), regulate export and import of livestock and livestock products. This Strategy would ultimately provide guidance to all actors in the sector to make investments that will increase incomes, reduce poverty, improve household food and nutrition security, create employment, and stimulate overall economic growth.

160. The Theory of Change (ToC) for animal health in food security and sustainable agriculture outlines how improved animal health can lead to a series of positive outcomes, ultimately contributing to a more sustainable and equitable food system. Overall, the ToC for animal health in food security and sustainable agriculture highlights the critical role of healthy animals in achieving a range of positive outcomes. By investing in animal health, Yemen can build a more resilient and equitable food system that benefits people, animals, and the planet.

161. Some points to consider are:

- The specific outcomes of the ToC will vary depending on the context, such as the type of livestock system, the geographical location, and the specific challenges faced.
- It is important to monitor and evaluate the effectiveness of animal health interventions to ensure they are achieving the desired outcomes.
- A collaborative approach is essential for successful implementation of the ToC. This includes working with governments, NGOs, research institutions, the private sector, and communities.

The figure below presents a breakdown of the key stages and outcomes:

Figure 9: YAHSIP Theory of Change steps

5.2 Vision

162. A Yemen where the highest standards of animal welfare are improved, supported by efficient and demand-driven animal health services, and where animal products easily access global markets and significantly contribute to sustainable development, the national economy, and food safety.

5.3 Objectives

163. The overall objective of the YAHSIP is to establish a robust and responsive animal health system that provides an animal health framework that enhances domestic food security and increases access of livestock and livestock products to national, regional and international markets.

164. The strategy sets out some challenging specific objectives that are separated into four broad categories:

- To minimize the spread of infectious/endemic diseases in animals by implementing vaccination programs, regular health monitoring, and quarantine measures in line with the WOAH standards.
- To improve access to veterinary services across different Governorates in Yemen.
- To emphasize the protection and welfare of animals, promoting humane treatment, and preventing cruelty and exploitation.
- To guard against and mitigate the effects of zoonotic diseases in animals which might imperil human health.

6. STAKEHOLDER ANALYSIS

6.1 Identification of key stakeholders and their roles in the sector

165. The animal health sector in Yemen involves a diverse range of stakeholders, each playing a vital role in ensuring the well-being of animals, preventing diseases, and promoting sustainable livestock production. From government bodies like the Ministry of Agriculture and Irrigation to veterinary services, livestock owners, research institutions, international organizations, and consumers, all stakeholders must collaborate and fulfill their responsibilities to achieve optimal animal health outcomes.

Table 5: Stakeholder Analysis

Category of Stakeholder	Function	Animal health Expectations
National Research Organizations	– Policy guidance – Enhanced linkages and networks with other research Institutions and stakeholders at local level	– Key source of livestock technologies and innovations, genetic resources, knowledge, information, and data – Involvement in animal health research agenda-setting and capacity building – Vector control and prevention methods
Regulators	Well-defined livestock policy, legal and regulatory environment	– Enforcement and adherence to law for quality assurance Participation in policymaking.
Teaching and Learning Institutions/Universities	– Opportunities for internship – Industrial linkages for skills development – Commercialization of research findings – Collaboration in animal health research in addressing disease control	– Supply of skilled manpower in animal health – Technology Development & Transfer – Facilitating exchange programs – Provide resources for research. – Collaboration in animal health research
Farmers/Pastoral Communities/Farmer Organizations/Community Based Organizations	Applying research findings, innovations, and technology packages for adaption and up-scaling	– Implement guidelines for diseases prevention and control – Participation in policy
Development Partners	Policy guidance and coordination	– Technical support – Financial Support and capacity building

Financial Institution	Provide policy guidance in financing livestock programs	Provide credit facilities in value chains
Private Sector	– Enabling business environment – Research and innovations development that are commercially viable	– Resources – Current technologies – Awareness creation – Capacity building
Manufacturers, Processors and Input Suppliers	Infrastructure support	– Inputs Supply & Value Addition of livestock products
Ministries/State Departments/ Government Agencies	Support and collaboration in development and implementation of policies, legal frameworks, projects and programs	– Synergies and Capacity building – Public health and safety – Ensure the long-term sustainability of natural resources – Promote economic development
Media and Information	Communication in the livestock sector (health)	– Publicity and awareness creation for the sector i.e. information dissemination
Governorates	Involvement in policy formulation, dissemination of research findings and innovations and contribution in setting of the animal health research agenda	– Support in the development and implementation of policies and legal frameworks
Extension service providers	Research findings, innovations and technology packages for dissemination and up-scaling by the relevant value chain actors	– Promoting technology uptake and commercialization – Publicity and awareness creation
Professional Bodies (i.e. Pharmaceutical industry)	Delivery of quality services in an ethical manner	– Assurance of compliance of standards and – Regulations
Regional/International bodies	Partnership and collaboration, compliance with treaties, agreements, and protocols	– Capacity building – International lobbying – Technical support
Joint sector consultation and cooperation mechanism	Collaboration and priority-setting	– Lobby for the implementation of, policies, programs and laws in the livestock subsector – Lobby for increased funding in livestock
Consumers	– Demand for animal welfare – Advocacy for animal health	– Purchasing decisions – Support for animal health products – Awareness of animal health issues

7. THE YAHSIP STRATEGIC PILLARS AND INVESTMENT PROGRAMMES

7.1 Strategic Priorities

166. Looking ahead, it is essential to continue prioritizing financial support for animal health in Yemen. The Investment Plan (IP) is the framework guiding investment in Yemen's animal health sector over the next ten (10) years 2024 to 2034. It has been prepared as a component of the YAHSIP. The

implementation of the Investment Plan relies upon the availability of funding and resources mobilized at the country level and through other regional and global funds and mechanisms. The Investment Plan prepared is utilized to guide joint resource mobilization, including that undertaken in collaboration with stakeholders. Whilst the Ministry of Agriculture and Irrigation will be the lead implementing agency for the IP, other ministries, departments, and agencies will also play important roles. The IP focuses on public investments while recognizing that the animal health sector growth must be driven by investments of private actors. It, therefore, supports critical policy, legal and regulatory reforms and will strengthen public institutions to fulfill their mandates. It further provides a framework for effective coordination within the public sector and between the public and private sectors.

167. These results will be achieved at a cost of **USD 2,031.1 million**. The Strategic Pillars (thematic Investment areas) that will lead to the realization of the goal are given below:

- **Strategic Pillar 1:** Improve the capacity of national veterinary institutes to deliver efficient animal health services.
- **Strategic Pillar 2:** Improve disease prevention and control strategies for safe animal health delivery.
- **Strategic Pillar 3:** Prevent, detect, and respond to health issues at the interfaces between humans, animals, and the environment.
- **Strategic Pillar 4:** Boost emergency readiness for key animal diseases and livestock calamities caused by climate change.
- **Strategic Pillar 5:** Establish long-term frameworks for prompt and consistent coordination.

168. There is a total of 23 programmes under the five pillars. The pillars are described in this section starting with the objective statement for each pillar sought to be achieved by the end of the expiration of the YAHSIP in 2034, a narrative describing the essence of the pillar and the main traits of its theory of change, including highlights to cross-cutting issues such as gender, environment, and nutrition, the description of each investment program, and the budget needed to implement each programme under the pillar. It is important to note that the estimated budget provided is based on extensive research and analysis of similar projects and programmes in other countries. The actual budget required may vary depending on the specific circumstances and needs.

Strategic Pillar 1: Improve the capacity of national veterinary institutes to deliver efficient animal health services.

Objective: *The ability of national veterinary institutes to effectively address and manage animal health issues will be enhanced by 2034 leading to substantial improvements in the capabilities of veterinary institutes to effectively prevent, diagnose, and treat animal diseases, ensuring the health and well-being of livestock.*

169. The capacity of national veterinary institutes to deliver efficient animal health services is of utmost importance for the overall well-being of the livestock sector in Yemen. The fragmented approach to tackle animal health issues limits the effectiveness of efforts to combat diseases, respond to outbreaks, and implement comprehensive vaccination programs. Strengthening the infrastructure will enhance the diagnostic capabilities of national veterinary institutes, enabling them to detect diseases early, monitor their spread, and respond promptly. Investing in the development of modern laboratory facilities, diagnostic equipment, and vaccines production units is then crucial. Through strategic investments, partnerships, and coordinated efforts, Yemen can pave the way for a more resilient and prosperous livestock sector, benefiting both its economy and the well-being of its people.

Theory of change (Pillar 1): The capacity of national veterinary institutes to deliver efficient animal health services will be enhanced through progresses in the access to quality veterinary care; the development of mobile veterinary units; training and development of veterinary personnel; enabling legislation on animal welfare, handling, and transportation, and traditional knowledge. By equipping veterinarians with up-to-date knowledge and skills, they will be better prepared to tackle emerging animal health challenges and provide efficient services. It is imperative to foster strong public-private partnerships with international organizations that can provide access to expertise, funding, and technical assistance. Engaging communities and raising awareness about animal health is also vital to ensure the success of veterinary institutes' efforts. The government and policymakers should recognize the importance of these factors and allocate the necessary resources to ensure the optimal functioning of national veterinary institutes. Only through these measures can food security improve, animal health outcomes be enhanced and the well-being of both animals and humans be safeguarded.

Programme 1.1: Establishment/rehabilitation of Veterinary Diagnostic Laboratories

170. Establishment/rehabilitation of veterinary diagnostic laboratories would significantly enhance disease surveillance capabilities. These laboratories would serve as central hubs for diagnosing and monitoring animal diseases, allowing for the prompt identification and containment of outbreaks. With the availability of veterinary diagnostic laboratories, veterinarians in Yemen will have access to advanced diagnostic tools and techniques. This programme focuses on investing in improving the quality and standardization of facilities, equipment, technology, data management, testing methods, and training needed to enable veterinary diagnostic laboratories to grow and thrive for the benefit of animal and public health. This will be supported through: (a) **assessing the current state of veterinary diagnostic laboratories**; (b) **investing in veterinary infrastructure and equipment**; (c) **training and capacity building to ensure the smooth operation of veterinary diagnostic laboratories**; (d) **delivering quality assurance and accreditation**. Accurate and timely diagnosis is essential for developing appropriate treatment plans and implementing effective disease control measures. Initiatives in veterinary sciences will be encouraged, leading to advancement of high-quality veterinary laboratory diagnostic services to support animal agriculture. These developments will not only benefit Yemen but also contribute to the global veterinary community.

Programme 1.2: Access to Quality Veterinary Care

171. Limited access to veterinary care has resulted in deteriorating health and welfare conditions for livestock. This has led to increased mortality rates, decreased productivity, and the spread of preventable diseases. To achieve tangible improvements, investing in veterinary care infrastructure and training is essential. This programme focuses on investing in veterinary care infrastructure, training, and resources to ensure timely diagnosis and treatment, leading to improved animal health and welfare. These will be supported through: (a) **facilitating the assessment of compliance of veterinary services with WOAH quality standards PVS tool;** (b) **strengthening education and training;** (c) **expanding veterinary services in rural areas;** and (d) **increasing awareness and education**. By implementing these strategies, access to quality veterinary care for livestock can be improved, which can have a positive impact on animal welfare and the livelihoods of livestock owners across the country.

Programme 1.3: Development of Mobile Veterinary Units

172. The lack of resources and the constant threat of violence make it difficult for veterinary professionals to provide comprehensive care. Investing in the development of mobile veterinary units, starting with one in each governorate is a crucial step toward improving animal healthcare services. This programme focuses on investing in access to healthcare services for animals in remote areas that are often neglected due to ongoing conflicts. These will be supported through: (a) **designing the mobile unit;** (b) **establishing mobile veterinary clinics**; (c) **provision of equipment**; (d) **training and deploying veterinary staff;** (e) **establishing collaborative partnerships and funding;** (f) **promoting community engagement;** and (g) **continuously monitor and evaluate the performance, impact, and cost-effectiveness**. By establishing mobile units, veterinary professionals can reach these underserved areas, providing preventive care, treatment, and health education, ultimately safeguarding public health. By ensuring the health and productivity of livestock, these units can improve the livelihoods of rural communities and promote economic stability.

Programme 1.4: Veterinary Personnel Training and Development

173. The absence of a standardized curriculum and certification process has resulted in inconsistent levels of competence among veterinary professionals. Training and development of veterinary personnel ensure that veterinarians possess the requisite knowledge and skills to diagnose and treat animal diseases effectively. This is crucial in preventing the spread of zoonotic diseases, which can have devastating consequences for both animals and humans. This programme focuses on investing in the development and adaptation of a competency based curriculum for animal health professionals. These will be supported through: (a) **strengthening veterinary educational institutions;** (b) **establishing continuing education programs;** (c) **strengthening public-private partnerships;** (d) **reviewing the veterinary curricula;** and (e) **standardizing certification and licensing.** Well-trained veterinarians contribute to the development of a sustainable and efficient animal health sector, which is vital for the socioeconomic growth of Yemen.

Programme 1.5: Enabling legislation on Animal Welfare, Handling, and Transportation, and Traditional Knowledge

174. Animal welfare is an essential aspect of any society, reflecting its values and commitment to compassion towards all living beings. While Yemen has made significant strides in various sectors, the issue of animal welfare has received limited attention. The current state of animal handling and transportation falls short of meeting international standards. This programme focuses on investing in developing regulations that protect and promote the well-being of animals in Yemen. These will be supported through: (a) **conducting comprehensive research and assessment in humane handling, care, treatment, and transportation of animals;** (b) **establishing standards and certification processes for the humane handling, care, treatment, and transportation of animals;** (c) **raising awareness and building public support;** (d) **train and deploy veterinarians and support staff; (e) develop and implement legislation; (f) promote community engagement;** and (g) **incorporate traditional knowledge into animal welfare policies and practices.** By following these steps, enabling legislation on animal welfare, handling, and transportation, and traditional knowledge can help improve the welfare of animals and promote sustainable livestock management practices.

Budget for the programmes

175. Improving the capacity of national veterinary institutes to deliver efficient animal health services necessitates a comprehensive budget that takes into account various factors. The estimated total annual budget required for Strategic **Pillar 1 is USD 22.43 million**. This budget would cover infrastructure rehabilitation, equipment procurement, training and capacity-building initiatives, as well as ongoing operational costs. It is essential to conduct further assessments and MAI/MAIF to collaborate with international partners to refine and secure the necessary funding to ensure the successful implementation of these improvements.

176. Due to years of conflict and instability, the veterinary institutes in Yemen have faced significant challenges in maintaining their infrastructure and acquiring modern equipment. A substantial portion of the budget must be allocated toward rehabilitating and establishing appropriate infrastructure. The proposed estimated cost for rehabilitating existing facilities and constructing new ones is **USD 5.55 million**.

177. Updating and procuring necessary equipment is crucial for effective service delivery. This includes laboratory equipment, diagnostic tools, surgical instruments, and vaccines. Estimating the exact cost of procuring equipment is challenging due to fluctuating market prices and the specific needs of each institute. Considering the scale of the activity and the need for modern and reliable equipment, an estimated budget of **USD 8.2 million** is proposed.

178. One of the primary considerations in estimating the budget for mobile veterinary units is the acquisition of essential equipment. This includes medical supplies, diagnostic tools, surgical instruments, and vaccines. The staffing needs may vary depending on the number and size of the units. Each unit would ideally comprise at least one veterinarian, one veterinary technician, and a driver. The estimated cost for a single unit's transportation, including the purchase of a reliable vehicle, fuel expenses, and maintenance, equipping a mobile veterinary unit, salaries, benefits, and training

expenses for the staff members, cost for training and outreach programs would be approximately **USD 2.5 million**. These funds would cover the initial purchase of equipment and ensure the units are adequately stocked to provide comprehensive veterinary care. Ongoing operational costs must be taken into account. These include salaries for veterinary personnel, maintenance expenses, and the procurement of consumables and medications. The annual operational budget will depend on the number of institutes, the size of the livestock population, and the range of services provided. Considering these factors, an estimated annual operational budget of **USD 200.000** is proposed to ensure the sustained delivery of efficient animal health services.

179. In addition to infrastructure and equipment, training and capacity-building programs are essential for enhancing the knowledge and skills of veterinary professionals. This not only supports the delivery of efficient animal health services but also contributes to the overall development of the sector. The budget for training programs could vary depending on the duration, scope, and level of expertise required. Allocating **USD 4.08 million** for training and capacity-building initiatives is a prudent estimate.

180. A comprehensive approach to animal welfare legislation would include the development of laws that address all aspects of animal welfare, such as protection from cruelty, standards for housing and care, and regulations for animal-related industries. This process requires legal expertise, consultation with stakeholders, and comprehensive research. To enforce the new legislation, regulatory bodies need to be established. These bodies will be responsible for monitoring compliance, investigating animal abuse cases, and ensuring the implementation of animal welfare standards. Training programs need to be conducted to equip law enforcement agencies, veterinarians, and animal shelter staff with the necessary knowledge and skills to enforce animal welfare laws effectively. Raising awareness among the public is crucial to foster a culture that values and respects animal welfare. Public awareness campaigns can be conducted through media outlets, educational institutions, and community engagement programs. The estimated cost for the development of laws, setting up regulatory bodies, for capacity building and training initiatives, and for public awareness campaigns will approximate **USD 1.9 million**.

Table 6. Budget for programmes under pillar 1 (2024-2034)

Programmes (USD million)	Total annual Budget	Total Budget (2024-2034)
Total Pillar 1	22.43	224.3
Programme 1.1: Establishment/rehabilitation of Veterinary Diagnostic Laboratories	5.55	55.5
Programme 1.2: Access to Quality Veterinary Care	8.2	82
Programme 1.3: Development of Mobile Veterinary Units	2.7	27
Programme 1.4: Veterinary Personnel Training and Development	4.08	40.8
Programme 1.5: Enabling legislation on Animal Welfare, Handling, and Transportation, and Traditional Knowledge	1.9	19

Strategic Pillar 2: Improve disease prevention and control strategies for safe animal health delivery.

Objective: *Disease prevention and control through the implementation of strategies for the safe animal health delivery will be enhanced by 2034 leading to safeguarding public health, protecting the livelihoods of farmers and livestock owners, and ensuring food security in the country*

181. As earlier mentioned, there are several significant diseases that pose great threats to the livestock industry in Yemen. A selection has been made of some that are of principal interest in the field of public health and stand out as major threats to the agricultural sector. The prevalence of these diseases underscores the urgent need for effective control measures. The improvement of disease prevention and control strategies in the context of animal health delivery plays a pivotal role in safeguarding both animal welfare and human health. With the increasing interconnectivity between humans and animals, the potential for zoonotic diseases to emerge and spread has become a significant concern. By implementing effective prevention measures, such as vaccination programs, regular health check-ups, and biosecurity protocols, the incidence of diseases can be significantly reduced. Robust disease control strategies help prevent the spread of contagious diseases, reducing the risk of large-scale outbreaks that can have devastating consequences for animal populations. Disease outbreaks can result in substantial financial losses due to increased mortality rates, decreased production efficiency, trade restrictions, and rising healthcare costs. By implementing proactive measures, such as early warning systems systems, rapid response protocols, and effective quarantine strategies, the economic impact of diseases can be minimized. This enables farmers, producers, and stakeholders to sustain their livelihoods, ensuring food security and economic prosperity. Addressing TADs in Yemen requires an integrated One Health approach. By adopting a holistic and collaborative approach, involving veterinarians, public health officials, researchers, and policymakers, we can develop comprehensive strategies to address emerging diseases effectively. This multidisciplinary collaboration ensures the integration of expertise from various fields, fostering innovation, and driving progress in disease prevention and control. It is essential that stakeholders from various sectors work together to prioritize the improvement of disease prevention and control strategies to create a more resilient and safer environment for animal health delivery.

Theory of change (Pillar 2): Disease prevention and control through the implementation of strategies for the safe animal health delivery will be enhanced through improvements in the way Yemen understand and implements diseases prevention and control strategies in animals, thereby safeguarding public health and ensuring sustainable agricultural practices. Prioritizing livestock diseases is crucial for the sustainable development of the livestock sector. This component focuses on investing in designing vaccination programs, implementing biosecurity measures, promoting good animal husbandry practices, and improving disease surveillance systems. It is imperative to acts promptly to prioritize livestock diseases and invest in their control to secure a prosperous future for its livestock sector and the people. Sharing resources, expertise, and best practices will facilitate the

implementation of strategies for the main transboundary animal diseases that require greater surveillance and organized control (PPR, Goat and Sheep Pox, FMD, Brucellosis, Avian Influenza and Lumpy Skin Disease). Collaborative efforts can help overcome political barriers, ensure sustainable funding, and promote knowledge exchange. Engaging and empowering local communities, establishing coordination mechanisms that brings together the public and private sectors, academia, the general public, and regional and international organizations to assist the country in reaching the goal of preventing, promptly detecting and controlling TADs through a national strategy is vital to ensure the sustainability and effectiveness of interventions.

To guide the decision to stop / exit vaccination programme for TADs the following discussion parameter need to be achieved:

- Was the virus circulation stopped after vaccination?
- Is the likelihood of introduction or re-introduction of the disease sufficiently reduced, based on the situation in neighboring countries or the risk at source?
- Is the sensitivity of surveillance (early detection) high enough to detect re-emergence?
- - Is the level of preparedness adequate in case of re-emergence (contingency plan, early response), with special attention on containing disease, maintaining a vaccine stock and carrying out emergency vaccination?

182. The estimated total annual budget for addressing priority zoonotic diseases listed in the **Strategic Priority 2** over the next decade has been estimated to be **USD 67.6 million**. This investment will help through diagnostic capacity and infrastructure, coordinated interventions, mass vaccination, biosecurity measures, surveillance systems, and awareness and education achieve the successful control or elimination of zoonotic diseases in Yemen. This is an approximate estimate based on the available information and assumptions. The actual budget may vary depending on the specific situation and needs of Yemen.

Programme 2.1: Development of a National Strategy to Control and Eradicate Peste des Petits Ruminants (PPR)

183. PPR is a highly infectious animal disease that affect most small ruminants in Yemen, decreasing the viability of the livestock. The co-existence with other small ruminant diseases such as sheep and goat pox, contagious caprine pleura-pneumonia, brucellosis, endo- and ecto-parasites compounds the problem and the socio-economic losses. This programme focuses on implementing steps that would lead to achieving PPR disease and infection freedom by the year 2034. Within this 10 years strategy, it is possible to organize ten (10) rounds of PPR vaccination. This would ensure that all sheep and goats are protected from the disease throughout the 10-year period. This will be supported through: (a) **promoting an enabling environment;** (b) **developing measures towards PPR eradication (PPR Preventive and Control Measures);** (c) **controlling other small ruminants' diseases in support of PPR eradication;** and (d) **coordinating, managing, and partnering**.

National PPR control and eradication strategy

A.	**Promotion of an enabling environment**
–	Setting of a technical committee of experts on PPR
–	Develop/update and harmonize SOPs for laboratory procedures, training, quarantine, surveillance, etc.
–	Develop legal instruments and legislation for the control and eradication of PPR and strengthen the enforcement of relevant sections of existing animal diseases control legislation
–	Stakeholders' awareness and engagement for different segments of society about existing regulations and laws
B.	**Develop measures towards PPR eradication**
–	A 3-year mass vaccination of targeted 80% of the national sheep and goats' herd
–	Pre and Post vaccination sero-monitoring carried out to assess the effectiveness of the vaccinations
–	1-year targeted vaccinations in PPR high risk areas (post 3-year programme)
–	Branding / identification of vaccinated animals
–	Biosecurity and animal movement control
–	Risk based vaccination approach
–	Engagement of private veterinarians in vaccination and biosecurity
–	Engagement of transporters, marketers, and processors in animal movement control, etc.
–	Verify eradication of PPR leading to WOAH accreditation of freedom
–	Application for the PPR freedom certification from the WOAH
C.	**Control of other small ruminants' diseases in support of PPR eradication**
–	Incorporation of contagious caprine pleura-pneumonia, brucellosis, endo- and ecto-parasites and sheep/goat pox
–	Adequately equip and mobilize to handle helminthosis, ectoparasitism and pox cases with wormers, antiprotozoans and pox vaccines
D.	**Coordination, Management and Partnerships**
–	Establish/strengthen the national level coordination and management structure
–	CVL properly networked with all laboratories spread across the country
–	Establish/strengthen the National PPR Coordinating Committee (NPCC) to act as an advisory committee on PPR
–	Participation at cross border, regional animal health and production networks' meetings/Sharing of data and information
–	Joint vaccination campaigns/Cross-border collaboration on PPR control activities with bordering countries to include common source of vaccines, and harmonized protocol
–	Sponsorship and funding of capacity building mechanisms in various areas

Budget for the programmes

1. To estimate the budget for PPR Yemen, we need to consider the following factors:
    - The number of sheep and goats in Yemen. According to the FAO, there were about 10.8 million sheep and 8.6 million goats in Yemen in 2019. Assuming a constant population growth rate,

we can project that there will be about 11.4 million sheep and 9.1 million goats in Yemen in 2023.

- The vaccination coverage and cost per animal. According to the PPR GCES, the vaccination coverage should reach at least 80 per cent of the susceptible population in each country. The cost per animal for vaccination is estimated at USD 0.5, which includes the vaccine, syringe, cold chain, delivery and administration.
- The cost of surveillance and assessment. According to the PPR GCES, surveillance and assessment activities are essential to monitor the disease situation and evaluate the impact of vaccination campaigns. The cost of surveillance and assessment is estimated at USD 0.05 per animal.
- The cost of coordination and management. According to the PPR GCES, coordination and management activities include the establishment of national and regional steering committees, the development of national and regional strategic plans, the organization of regional roadmap meetings, and the provision of technical support and guidance. The cost of coordination and management is estimated at USD 0.02 per animal.

Based on these factors, we can calculate the total budget for Yemen as follows: The total number of sheep and goats to be vaccinated in Yemen is 80% x (11.4 million + 9.1 million) = 16.4 million. The total cost of vaccination is USD 0.5 x 16.4 million = USD 8.2 million. The total cost of surveillance and assessment is USD 0.05 x 16.4 million = USD 0.82 million. The total cost of coordination and management is USD 0.02 x 16.4 million = USD 0.33 million. The estimated annual budget is USD 8.2 million + USD 0.82 million + USD 0.33 million = **USD 9.35 million**.

Programme 2.2: Implementation of Prevention and Control measures for sheep and goat pox outbreaks

184. The plan in Yemen to control and eradicate goat and sheep pox involves several strategies. This will be supported through: (a) **conducting mass vaccinations of susceptible animals in affected regions using effective and safe vaccines;** (b) **the establishment of an active surveillance system to monitor disease outbreaks, identify new cases, and track the effectiveness of the vaccine;** and (c) **maintaining strict biosecurity standards at farms and markets to prevent the introduction or spread of the virus**. efforts are being made to improve farmers' awareness about the disease through educational programs which aim to educate them about the early signs, preventive measures, and reporting protocols. By adhering to this multifaceted approach, Yemen aims to effectively control and ultimately eradicate goat and sheep pox from its livestock population, thereby safeguarding animal health as well as protecting livelihoods that depend on these valuable resources.

185. If sheep or goat pox is confirmed, the outbreak will be controlled in line with the contingency plan for exotic notifiable diseases. These strategies are crucial for controlling and preventing the spread of goat and sheep pox in the Middle East. However, specific national control plans vary between countries, so advice should be sought from the relevant authorities and veterinarians. The plan in Yemen to control and eradicate goat and sheep pox involves several strategies, including:

National GSP control and eradication strategy

A.	**Culling infected and in-contact sheep/goats**
–	Timely Recognition of Disease Eruption of sheep pox virus (SPPV) and goat pox virus (GTPV)
–	Early detection and notification, prompt movement restriction of animals, an extension of duration and size of the protection zone and culling affected herds, based on clinical signs
–	Vector Control that spread the disease
–	Restricting the movement of animals to prevent the spread of the disease
–	Isolation of Infected Animals by moving healthy animals away from them
–	Quarantine Before Introduction in the Herd
B.	**Vaccination and mass treatment campaigns**
–	Only live attenuated vaccines are available for SPP/GTP
C.	**Sanitary measures**
–	Cleaning and Disinfection
–	Disinfection of Equipment that has come into contact with infected animals should be disinfected
–	Proper Disposal of Carcasses and Products from infected animals
D.	**Awareness Raising Campaigns**
–	Awareness raising campaigns for farmers and veterinary staff to promote recognition of the disease should be considered
E.	**Practicing Strict Biosecurity**
–	Reporting Suspicion of Sheep or Goat Pox

Budget for the programmes

186. Controlling and preventing sheep and goats' pox in Yemen requires a comprehensive strategy backed by a substantial budget. Allocating the proposed estimated annual budget of **USD 2 million** towards vaccination programs, training and education, disease surveillance, biosecurity measures, and research and development would significantly mitigate the impact of this disease on livestock populations.

187. It is crucial to allocate a significant portion of the budget towards procuring an adequate supply of vaccines, along with the necessary equipment and infrastructure to administer them. Considering the size of the livestock population, the cost of vaccinations is estimated to be approximately USD 800,000.

188. To ensure the successful implementation of vaccination programs and other preventive measures, it is essential to invest in training veterinarians and livestock owners. This would enable them to identify the signs and symptoms of the disease, administer vaccinations, and implement proper biosecurity measures. Allocating funds for workshops, seminars, and educational materials would enhance the knowledge and skills of those involved in livestock management. Approximately USD 400,000 should be dedicated to training and education initiatives.

189. Establishing a network of diagnostic laboratories equipped with the necessary tools and trained personnel would facilitate prompt diagnosis and reporting of cases. An estimated budget of USD 200,000 is necessary to establish and maintain an efficient surveillance program.

190. Preventing the introduction and spread of sheep and goats pox requires implementing strict biosecurity measures. This includes controlling animal movement, ensuring proper quarantine protocols, and promoting hygiene practices among farmers. A substantial portion of the budget, approximately USD 400,000, should be allocated towards raising awareness about biosecurity measures and facilitating their implementation at the farm level.

191. Raising awareness among farmers and communities about the disease, its transmission, and prevention measures is critical for reducing disease incidence. The allocation of USD 200,000 will cover the development and dissemination of educational materials, workshops, and community outreach programs.

Programme 2.3: Implementation of a National Foot and Mouth Disease Control Strategy

192. The Progressive Control Pathway for Foot and Mouth Disease (FMD) developed by FAO and EUFMD outlines a stepwise approach to achieving and maintaining freedom from FMD disease. The pathway consists of five stages, each with specific goals and activities to be implemented. The Progressive Control Pathway is a dynamic and adaptable approach that can be tailored to the specific needs and challenges of each country. Yemen's unique geography, livestock production practices, and political and economic situation will all play a role in determining the implementation of the pathway. This is supported the fundamental principles of: (a) **strengthening surveillance systems to promptly detect and report any FMD outbreaks**.; (b) **improving biosecurity measures within livestock farms and markets**.; (c) **prioritize widespread vaccination coverage among susceptible livestock populations**; (d) **enhancing public awareness about FMD**. Strong collaboration between government agencies, farmers' associations, veterinary professionals, and other stakeholders is emphasized to ensure effective implementation. This concerted effort aims not only to control FMD within national borders but also to eliminate the disease entirely from Yemen through rigorous monitoring systems and targeted eradication strategies.

National FMD control strategy

Stage 1: Disease Elimination The overarching goal of Stage 1 is to understand the risks- where they are and what they are. To achieve this, Yemen will need to:
• Strengthen surveillance systems to detect and report FMD outbreaks promptly.
• Implement stringent biosecurity measures to prevent the introduction and spread of FMD within livestock farms and markets.
• Prioritize widespread vaccination coverage among susceptible livestock populations.
• Raise public awareness about FMD to promote adherence to prevention and control measures.

• Establish a robust veterinary infrastructure to support effective disease control efforts.
Stage 2: Risk-based control measures implemented and monitored **In Stage 2, the focus shifts to maintaining FMD freedom by maintaining a strong surveillance system and implementing rapid outbreak response measures. Key activities in this stage include:**
• Continuously monitor livestock for signs of FMD through active surveillance and passive surveillance.
• Establish rapid response teams to investigate suspected FMD cases, implement containment measures, and conduct epidemiological investigations.
• Implement rapid vaccination campaigns to protect susceptible animals in affected areas.
• Maintain biosecurity measures to prevent further spread of the disease.
• Conduct regular serological surveys to assess the effectiveness of vaccination programs and monitor herd immunity levels.
Stage 3: Rapid detection and response to all FMD outbreaks **Stage 3 allows for controlled movement of livestock within FMD-free zones, while maintaining strong surveillance and biosecurity measures. This stage requires:**
• Establishing trade safeguards to prevent the introduction of FMD into FMD-free zones.
• Implementing movement restrictions for livestock and animal products.
• Training livestock handlers on FMD prevention and control measures.
• Conducting regular port health checks to prevent the introduction of FMD through imported livestock and animal products.
Stage 4: Endorsed National Control Program implemented and monitored **Stage 4 focuses on enhancing disease surveillance, risk management, and stakeholder engagement. Activities include:**
• Expanding surveillance to wildlife populations to monitor for potential FMD reservoirs.
• Developing biosecurity guidelines for livestock trade and animal movement.
• Strengthening communication and coordination among stakeholders involved in FMD prevention and control.
• Supporting vaccine development for improved protection against FMD variants.
Stage 5: Freedom from FMD **In Stage 5, Yemen achieves the ultimate goal of freedom from FMD. This requires:**
• Sustained surveillance and outbreak response to maintain FMD freedom.
• Continued biosecurity measures to prevent the introduction and spread of FMD.
• Regular review and adaptation of FMD prevention and control strategies based on evolving epidemiological data.
• Strong commitment from all stakeholders to maintain FMD freedom.

Budget for the programmes

193. The control of foot and mouth disease is vital to safeguard Yemen's livestock industry, food security, and overall socio-economic stability. A comprehensive approach combining short-term strategies, long-term investments, and research initiatives is necessary to effectively combat this highly contagious disease. Allocating the proposed estimated annual budget of **USD 10 million** will

enable Yemen to establish robust quarantine facilities, implement vaccination programs, enhance veterinary infrastructure, conduct research, and build capacity.

194. An effective surveillance system is crucial for early detection and containment of sheep and goat pox outbreaks. The allocation of USD 2.5 million will cover the establishment of a network of trained personnel, data collection and analysis tools, and communication channels for outbreak reporting and response.

195. Proper biosecurity measures are essential for preventing the introduction or spread of the sheep and goat pox virus within livestock farms and markets. The allocation of USD 2 million will cover the implementation of biosecurity protocols, training for farmers and market operators, and provision of biosecurity equipment.

196. Vaccination is the most effective way to protect susceptible livestock populations from sheep and goat pox. The allocation of USD 3.5 million will cover the procurement of high-quality vaccines, training and mobilization of vaccination teams, and logistics for reaching all susceptible animal populations.

197. Raising awareness among farmers and communities about sheep and goat pox, its transmission, and prevention measures is critical for reducing disease incidence. The allocation of USD 1 million will cover the development and dissemination of educational materials, workshops, and community outreach programs.

198. Effective coordination, management, and partnerships are essential for the successful implementation of sheep and goat pox prevention and control measures. The allocation of USD 1 million will cover the establishment of a national sheep and goat pox control committee, capacity building for veterinary and public health personnel, and collaboration with international organizations and neighboring countries.

Programme 2.4: Establishment of Preventive and control measures for an effective control of Lumpy Skin Disease

199. Lumpy Skin Disease is a problem that requires high level of awareness at technical and political level, involving many countries and can only be dealt with through coordinated international efforts. This programme focuses on establishing preventive and control measures for an effective control of Lumpy Skin Disease. This will be supported through: (a) **immediate culling and safe destruction of infected animals**; (b) **safe mass vaccination, the most effective option for controlling the spread of Lumpy Skin Disease**; and (c) **movement controls to avoid long distance spread via direct contact with affected animals**; (d) **Assess the most suitable duration of Lumpy Skin Disease vaccination campaign, using live homologous vaccines**; and (e) Awareness for public and private veterinarians as well as veterinary students, farmers, herders, cattle merchants, cattle truck drivers, and artificial inseminators, both in the field and in abattoirs. Within this 10 years strategy, it is possible to organize ten (10) rounds of Lumpy Skin Disease vaccination. This would ensure that all animals are protected from the disease throughout the 10-year period. The strategy sets out how outbreaks of lumpy skin disease in cattle is managed and is as follows:

National LSD control strategy

A.	Enhanced Surveillance and Diagnosis
B.	Movement Control (Quarantine): This involves restricting the movement of animals to prevent the spread of the disease.
C.	Vaccination: Vaccination is a key strategy in controlling the disease.
D.	Health Promotion and Education, Raising awareness among the affected communities
E.	Slaughter Campaigns: Infected animals may need to be culled to prevent the spread of the disease.
F.	Management Strategies: This includes maintaining hygiene and biosecurity standards.
G.	Research and Development
H.	Strengthening Healthcare Infrastructure

Budget for the programmes

200. Controlling and preventing lumpy skin disease in Yemen requires a comprehensive budget that covers essential aspects such as vaccination programs, diagnostic testing, public awareness campaigns, and infrastructure development. The estimated annual budget for these measures would amount to approximately **USD 5.25 million**. It is crucial for the government, in collaboration with international organizations and donors, to allocate funding to combat this disease effectively.

201. Vaccination is the most effective way to protect susceptible cattle populations from LSD. The allocation of USD 2.1 million will cover the procurement of high-quality vaccines, training and mobilization of vaccination teams, and logistics for reaching all susceptible animal populations. Veterinary professionals play a crucial role in administering vaccines and maintaining cold chain systems to ensure vaccine efficacy. The allocation of USD 1.05 million will cover training programs for veterinarians and veterinary technicians on LSD vaccine administration, cold chain management, and disease surveillance.

202. Accurate and timely diagnostic testing is essential for confirming LSD cases and tracking the disease's spread. The allocation of 1.05 million USD will cover the establishment of diagnostic laboratories, procurement of testing kits, and training of laboratory personnel on LSD diagnostic techniques. Maintaining the laboratory and conducting regular testing requires ongoing funding for equipment, supplies, and personnel. The allocation of 300,000 USD will cover the recurring costs of laboratory operations. Raising awareness among cattle owners and communities about LSD, its transmission, and prevention measures is critical for reducing disease incidence. The allocation of 500,000 USD will cover the development and dissemination of educational materials, workshops, and community outreach programs. Effective disease control involves measures such as quarantine of infected animals, movement restrictions, and culling of severely affected animals. The allocation of 250,000 USD will cover the costs of implementing these control measures.

Programme 2.5: Implementation of an Animal brucellosis Control and eradication Strategy

203. This programme focuses on the control and eradication of brucellosis. It is a comprehensive strategy that aims to tackle this infectious disease, which poses significant challenges to public health and livestock production. This will be supported through: (a) **enhanced surveillance and early detection of infected animals**; (b) **strict movement controls**; (c) **effective vaccination campaigns**; and (d) **promoting public awareness about brucellosis prevention**. It emphasizes the need for capacity building among veterinary professionals through training programs and establishing diagnostic laboratories equipped with state-of-the-art infrastructure. The plan also highlights the importance of systematic data collection and analysis to monitor progress and identify areas requiring further intervention. Of paramount importance is the intersectoral collaboration and coordination within and among animal and public health sectors, as well as seeking the collaboration with the international organizations.

National Brucellosis control strategy

A.	Strict biosafety and management measures in livestock farms
B.	Public health and animal health sectors empowered with sufficient technical and financial resources as well as an appropriate legal background
C.	Animal health personnel trained on the cold chain maintenance and safe use of vaccines
D.	Vaccines should originate from the same source, and accepted following quality certification of the seed batch strain by an approved international reference laboratory
E.	Vaccination of animals and humans at risk
F.	Test-and-slaughter strategy for seropositive animals
G.	Immunization of the susceptible population
H.	Environmental hygiene and sanitation
I.	Personal protection and awareness for humans
J.	Public health and animal health diagnostic laboratories well-equipped and staffed with trained personnel
K.	Public health and animal health authorities should coordinate among themselves and exchange data, information, and feedback reports vertically and horizontally
L.	The progress of the brucellosis control program should be evaluated annually, and corrective actions adopted where appropriate, or alternative strategies may be considered
M.	Integration with other animal health programs facilitates the development of brucellosis control program, considering its long duration and cost
N.	Transboundary livestock's movements necessitate international collaboration and commitments to ensure sustainability of efficient brucellosis and other zoonoses control programs
O.	Conducting awareness programmes
P.	Legislation promulgation and/or amendment should be endorsed where appropriate
Q.	Intersectoral collaboration and coordination within and among animal and public health sectors, as well as collaboration with the international organizations

Budget for the programmes

204. To effectively control brucellosis in Yemen, a comprehensive annual budget of approximately **USD 8 million** is required. This budget should cover vaccination programs, control measures for animal movement and trade, establishment of diagnostic facilities, procurement and distribution of antibiotics, and public awareness campaigns. Investing in these areas will not only reduce the disease burden but also alleviate the economic impact and improve the overall health and well-being of the Yemeni population. It is essential for the government of Yemen, in collaboration with international organizations and donors, to prioritize and allocate these funds to combat brucellosis effectively.

205. Vaccination programs targeting livestock, which are the primary reservoir for Brucella spp., are of paramount importance. Allocating funds for vaccine procurement, storage, and distribution is crucial. Based on estimates from the Food and Agriculture Organization, the cost of vaccinating 70% of Yemen's livestock population would amount to approximately USD 3 million. Implementing strict control measures for animal movement and trade, as well as improving animal husbandry practices, are essential in reducing the risk of transmission to humans. These measures require continuous monitoring and enforcement, which necessitates a budget of approximately USD 1 million for personnel training, equipment, and surveillance programs.

206. Establishing well-equipped diagnostic laboratories and training healthcare professionals in accurate and timely diagnosis is paramount. Allocating a budget of approximately USD 1 million to establish diagnostic facilities, procure diagnostic kits, and provide training for laboratory technicians and clinicians would significantly enhance the capability to diagnose brucellosis. Strengthening the pharmaceutical supply chain, ensuring a steady provision of antibiotics, and conducting drug susceptibility testing are vital components. Based on estimates from the World Health Organization, a budget of around USD 2 million should be dedicated to procurement and distribution of antibiotics, as well as establishing drug resistance surveillance programs. Public awareness campaigns play a pivotal role in preventing brucellosis by educating communities about the disease's transmission, symptoms, and preventive measures. Allocating funds to conduct health education campaigns, produce educational materials, and engage with local healthcare workers and community leaders is essential. With a budget of approximately USD 1 million, the government can implement targeted awareness programs, reaching both rural and urban populations.

Programme 2.6: National Strategy for Prevention and Control of Avian Influenza

207. This programme focuses on the control and eradication of Avian Influenza. It is a multifaceted approach that aims at addressing all aspects of the disease. The government has implemented strict surveillance measures, targeting both commercial and backyard poultry farms, to detect any signs of infection early on. This will be supported through: (a) **regular testing of birds for the presence of the virus and prompt reporting of any suspected cases**; (b) **putting robust biosecurity protocols in place, including strict quarantine procedures and regulations regarding the importation and movement of live birds and poultry products**; (c) **emphasizing on public awareness campaigns to educate farmers and the general population about avian influenza symptoms, prevention measures, and safe handling practices**. Vaccination programs have been initiated to ensure the immunization of poultry

populations against specific strains of the virus. Continuous monitoring and evaluation efforts are vital components of this comprehensive strategy, enabling adjustments as necessary to effectively combat avian influenza in Yemen. The aim is to prevent avian influenza transmission to humans, as well as to rapidly detect human cases, care for potential patients, and respond to outbreaks. The control and prevention strategies for avian influenza are as follows:

National Avian Influenza control strategy

A.	Strengthening Regional Avian Influenza Surveillance and Response
B.	Creation of a National Technical Commission for information exchange and analysis between ministries of health, agriculture, and environment
C.	Investment in Prevention and Control to prevent and control avian influenza
D.	Decreasing Diagnosis Time (from several days to less than six hours)
E.	Partnership with Organizations
F.	National Level Conduct at the national level in partnership with the Ministry of Agriculture and Irrigation
G.	Strengthening Surveillance and Response
H.	Reporting suspected outbreaks to a state veterinarian as soon as possible
I.	Quarantine and Movement Controls to prevent sick birds from getting into contact with susceptible birds
J.	Stamping Out: culling of all infected and exposed birds, the correct disposal of carcasses and all animal products, thorough decontamination of infested premises
K.	Risk Communication and Community Engagement Strategies
L.	Hygiene and Biosecurity Standards
M.	Early Detection of Human Infections and Containment Measures
N.	Prevention
O.	Monitoring the disease on farms to take quick steps and alert others of the danger when an outbreak occurs
P.	Monitoring Other Animals which can contract influenza and transmit the virus to people

Budget for the programmes

208. Controlling and eradicating avian influenza in Yemen requires a significant financial commitment. Allocating an annual estimated budget of approximately **USD 14 million** towards prevention, surveillance, and response measures would enable to combat this disease effectively.

209. Preventing the introduction and spread of avian influenza is crucial to minimizing its impact on both birds and humans. This requires robust surveillance systems, public awareness campaigns, and biosecurity measures. Allocating a significant portion of the estimated budget towards prevention efforts is essential. There is a need to invest in strengthening the surveillance systems to detect and monitor avian influenza outbreaks effectively. This includes establishing a network of laboratories capable of timely and accurate diagnosis, as well as implementing a comprehensive surveillance

program covering both domestic and wild bird populations. The estimated budget for developing and maintaining such a surveillance system of around USD 3 million.

210. Educating the public, farmers, and poultry workers about avian influenza is crucial for early detection and prevention. The allocated funds for targeted public awareness campaigns, including the production and dissemination of educational materials, workshops, and training programs. The estimated budget for implementing these campaigns of around USD 1 million. Strengthening biosecurity measures in poultry farms and live bird markets is vital to prevent the transmission of avian influenza. There should be investment in enhancing the infrastructure, providing necessary equipment, and training personnel to ensure proper implementation of biosecurity protocols. The estimated budget for these measures could amount to USD 2 million.

211. Rapid detection and effective response to avian influenza outbreaks are crucial to contain the disease and prevent its spread. Yemen needs to allocate a substantial portion of the estimated budget towards strengthening surveillance and response capabilities. Establishing and maintaining dedicated rapid response teams equipped with the necessary resources and expertise is essential. These teams should be responsible for promptly investigating and responding to suspected avian influenza cases. The estimated budget for establishing and maintaining such teams could amount to USD 3 million. Implementing vaccination programs for poultry in high-risk areas can significantly reduce the spread of avian influenza. The estimated budget for vaccination programs could approximately amount to USD 2 million. Avian influenza knows no borders, and international collaboration is crucial for effective disease control. The allocated funds should cover funds to participate in regional and global initiatives, exchange information, and access technical expertise. The estimated budget for international collaboration efforts could amount to USD 2 million.

Programme 2.7: National Strategy for Prevention and Control of Rift Valley fever

212. This programme focuses on the control and eradication of RVF. There is not any specific treatment for RVF. Outbreaks in animals can be prevented by a sustained programme of animal vaccination. Both modified live attenuated virus and inactivated virus vaccines have been developed for veterinary use. outbreaks are associated with heavy rainfall and flooding, which provides ideal conditions for mosquito vector multiplication and, consequently, disease emergence. Early detection and response to RVF outbreaks in animals before spillover to humans must be the primary objective of the country's animal health surveillance system. This will be supported through: (a) Sanitary prophylaxis; (b) Medical prophylaxis; (c) Public health education and risk reduction; (d) Infection control in health care settings; and (e) coordinating on animal and human health and providing additional support. International organizations, donor countries, and Yemen's government must collaborate to secure the required funding and implement this strategy, mitigating the impact of RVF and safeguarding the health and livelihoods of the Yemeni people.

National RFV control strategy

A.	**Sanitary prophylaxis**
–	Control of animal movements (extension of disease) and clinical management of RVF cases
–	Controls at slaughterhouses (exposure to disease)
–	Draining of standing water to eliminate or reduce vectors
–	Disinfestations of low depression accumulations of water where mosquitoes may reproduce
–	Use of methoprene spraying or controlled burning
–	Prophylactic measures such as monitoring risk factors and vector populations
–	During mass animal vaccination campaigns, animal health workers may, inadvertently, transmit the virus through the use of multi-dose vials and the re-use of needles and syringes.
B.	**Medical prophylaxis**
–	Attenuated virus vaccine, one inoculation confers immunity lasting 3 years safe for all breeds of cattle, sheep and goats
–	Single injection regimen of inactivated virus vaccine
–	Needs a booster 3-6 months after initial vaccination, followed by yearly boosters.
–	Used in outbreak situations and pregnant animals
C.	**Public health education and risk reduction**
–	Promotion of material and education of personnel
D.	**Coordination of efforts of stakeholders regarding human and animal health**
–	Establishment of an active animal health surveillance system to detect new cases is essential in providing early warning for veterinary and human public health authorities.

Budget for the programmes

213. To effectively controlling and preventing Rift Valley Fever in Yemen requires a multi-faceted and well-funded strategy. The annual estimated budget for such a strategy, considering surveillance and early warning systems, vaccination campaigns, vector control measures, diagnostic capacity strengthening, public awareness and education programs, and capacity building for healthcare workers, amounts to approximately **USD 7 million**. This investment is necessary to protect public health, ensure food security, and support the overall well-being of the Yemeni population.

214. Surveillance and early warning systems form the backbone of any effective disease control strategy. In the case of RVF, these systems would involve the establishment of a network of sentinel sites to monitor animal and human health, as well as the development of a robust reporting mechanism. Laboratory facilities must be equipped to quickly and accurately diagnose RVF cases. To establish and maintain such systems, a significant investment is required. The estimated budget for surveillance and early warning systems in Yemen is approximately USD 1 million. Vaccination is a key preventive measure against RVF. To protect both animals and humans, a comprehensive vaccination campaign must be implemented across the country. This campaign would involve the procurement of vaccines, training of personnel, and the establishment of vaccination centers. Considering the vast

population of livestock in Yemen, the estimated budget for a nationwide vaccination campaign against RVF would be around USD 2 million.

215. RVF is primarily transmitted through mosquitoes, making vector control measures an essential part of any strategy. These measures include insecticide spraying and the use of bed nets. Additionally, public health campaigns should be conducted to educate the population on personal protective measures. To effectively implement vector control measures in Yemen, an estimated budget of USD 1 million would be required. Strengthening diagnostic capacity is crucial for early detection and response to RVF cases. This includes training laboratory personnel, procuring necessary equipment and reagents, and establishing quality control mechanisms. To adequately strengthen diagnostic capacity in Yemen, an estimated budget of USD 1 million is required.

216. Raising public awareness about RVF is vital to prevent its spread and ensure early reporting of cases. This component involves the development and dissemination of educational materials, conducting community outreach programs, and training community health workers. To effectively implement public awareness and education programs, an estimated budget of USD 500,000 would be necessary.

217. Building the capacity of healthcare workers is essential to ensure proper diagnosis, treatment, and surveillance of RVF cases. This component involves conducting training programs, workshops, and providing necessary resources to healthcare facilities. The estimated budget for capacity building initiatives aimed at healthcare workers in Yemen is approximately USD 1.5 million.

Programme 2.8: National Strategy for Prevention and Control of Clostridia infection

218. This programme focuses on the prevention and control of Clostridia infection. Investing in preventive measures is essential for protecting livestock and livelihoods from the detrimental effects of clostridial infections. By implementing strategies, farmers can effectively safeguard their animals and ensure the long-term sustainability of their livestock operations. This will be supported through: (a) Vaccination campaigns, (b) diagnostic facilities, (c) education and awareness programs, (d) research and development, (e) infrastructure development, and (f) surveillance systems. All are critical components that necessitate careful financial planning and allocation. Policymakers, organizations, and stakeholders can work together to secure the necessary resources and implement a comprehensive strategy to combat clostridial infections, thereby safeguarding livestock health and ensuring sustainable livestock production in Yemen. A comprehensive clostridial infections prevention and control strategy could use the following items:

National Clostridia control strategy

A. Enhancing Healthcare Infrastructure
– Improved Access to Diagnosis and Treatment: Ensure adequate availability of diagnostic facilities and trained healthcare professionals to effectively diagnose and treat clostridial infections promptly.
– Strengthened Laboratory Capacity: Equip laboratories with advanced diagnostic tools and technologies to accurately identify clostridial pathogens and their antimicrobial susceptibilities.

– Establish Antibiotic Stewardship Programs: Implement antibiotic stewardship programs to promote judicious antibiotic use, preventing the emergence of antibiotic-resistant clostridial strains.
– Promote Hospital Infection Control Programs: Implement and enforce comprehensive infection control practices in hospitals and healthcare settings to minimize the risk of clostridial infection transmission.
B. Public Awareness and Education Campaigns
– Raise Public Awareness: Conduct targeted public awareness campaigns to educate the public about clostridial infections, their symptoms, risk factors, and prevention measures.
– Educate High-Risk Groups: Focus specifically on educating high-risk groups, such as elderly individuals, hospitalized patients, and those with compromised immune systems, about the importance of infection prevention and early treatment.
– Utilize Diverse Communication Channels: Employ various communication channels, including print media, radio, television, social media, and community outreach programs, to disseminate information effectively.
– Promote Proper Hygiene Practices: Emphasize the importance of proper hand hygiene, food safety practices, and wound care techniques to prevent clostridial infection acquisition.
– Encourage Vaccination: Promote awareness about the benefits of clostridial vaccines, particularly for high-risk individuals, and encourage vaccination uptake.
C. Strengthening Vaccination Programs
– Expand Vaccine Availability: Ensure adequate availability of high-quality clostridial vaccines for all eligible individuals, particularly in high-risk populations.
– Integrate Vaccination into Routine Healthcare: Integrate clostridial vaccination into routine immunization schedules for infants, children, adults, and high-risk groups.
– Target Specific Populations: Prioritize vaccination programs for high-risk populations, such as elderly individuals, hospitalized patients, and those with compromised immune systems.
– Monitor Vaccine Effectiveness: Conduct regular studies to monitor the effectiveness of clostridial vaccines and identify potential gaps in coverage or protection.
– Promote Vaccine Confidence: Address vaccine hesitancy and misconceptions through targeted education and engagement with healthcare providers and community leaders.
D. Research and Development
– Support Research on Clostridial Pathogens: Fund research on clostridial pathogens to better understand their biology, transmission dynamics, and mechanisms of pathogenesis.
– Develop Novel Diagnostics: Encourage the development of more rapid, sensitive, and cost-effective diagnostic tools for clostridial infections.
– Support Antibiotic Development: Invest in research and development of novel antibiotics with activity against clostridial pathogens, particularly those with increasing resistance.
– Explore Alternative Prevention Strategies: Investigate alternative prevention strategies, such as probiotics, prebiotics, or bacteriophages, to reduce the reliance on antibiotics.
– Promote Vaccine Research: Support research on improved clostridial vaccines, including next-generation vaccines with enhanced efficacy and broader coverage.
E. Strengthening Infection Control Practices
– Hand Hygiene: Implement rigorous hand hygiene practices among healthcare workers and community members, emphasizing frequent hand washing with soap and water or alcohol-based hand rub.
– Environmental Cleaning: Implement thorough environmental cleaning and disinfection protocols in healthcare settings and other high-risk environments.
– Proper Wound Care: Ensure proper wound care techniques, including prompt cleaning, disinfection, and appropriate dressings, to minimize the risk of clostridial infection from wounds.
– Antibiotic Stewardship: Implement and enforce antibiotic stewardship programs to ensure judicious antibiotic use and minimize the emergence of antibiotic-resistant clostridial strains.

	– Staff Education and Training: Provide regular training and education to healthcare workers on infection control practices, clostridial infection prevention, and early detection measures.
F.	**Surveillance Systems**
	– Establish Surveillance Networks: Establish nationwide surveillance networks to monitor clostridial infection incidence, identify outbreaks, and track antimicrobial resistance trends.
	– Standardize Reporting: Standardize reporting protocols for clostridial infection cases to ensure accurate data collection and analysis.
	– Utilize Electronic Systems: Utilize electronic data management systems to collect, analyze, and share surveillance data efficiently.
	– Analyze Surveillance Data: Regularly analyze surveillance data to identify trends, risk factors, and areas of high clostridial infection incidence.
	– Disseminate Findings: Disseminate surveillance findings to relevant stakeholders, including healthcare providers, public health officials, and policymakers, to inform prevention and control strategies.

Budget for the programmes

219. The effective annual allocation of **USD 7 million** budget across various aspects of the strategy for preventing and controlling clostridial infections is crucial for curbing the burden of this public health challenge. This comprehensive approach, backed by research and strategic planning, will pave the way for a healthier and more resilient livestock population.

220. A substantial portion of the budget, approximately USD 1.4 million, should be allocated to improving healthcare infrastructure. This includes establishing well-equipped laboratories, strengthening diagnostic facilities, and enhancing surveillance systems. Additionally, training healthcare personnel in the proper identification and management of clostridial infections is essential. Allocating USD 1 million towards public awareness and education campaigns is crucial to ensure the successful prevention and control of clostridial infections. This includes developing targeted educational materials, organizing community outreach programs, and utilizing mass media platforms.

221. Vaccination plays a critical role in preventing the spread of clostridial infections. Allocating USD 2 million towards strengthening vaccination programs would enable to ensure widespread access to vaccines and increase vaccine coverage. This includes procuring vaccines, establishing cold chains for proper storage, conducting vaccination campaigns, and expanding immunization facilities. To advance knowledge and enhance prevention strategies, allocating USD 1.2 million to research and development is vital. This funding can support research initiatives aimed at understanding the epidemiology, antibiotic resistance patterns, and risk factors associated with clostridial infections. Additionally, the budget can be used to facilitate collaborations with international research institutions, enabling Yemeni researchers to participate in global efforts to combat clostridial infections effectively.

222. Improving infection control practices is pivotal in reducing the transmission of clostridial infections. Allocating USD 800.000 towards this aspect would enable to establish and enforce robust infection control guidelines across healthcare facilities. This includes training veterinarians in proper hand hygiene, enhancing sterilization methods, and promoting the implementation of isolation protocols. Effective surveillance systems are crucial for monitoring and controlling the spread of clostridial infections. Allocating USD 600.000 towards the establishment of a robust surveillance

system will enable the timely detection of cases, prompt response, and effective allocation of resources. This includes the development of data collection and analysis tools, strengthening disease reporting mechanisms, and enhancing communication between animal healthcare facilities and public health authorities.

Programme 2.9: National Strategy for Prevention and Control of Rabies

223. This programme focuses on the prevention and control of Rabies. Investing in the prevention and control of rabies in Yemen is a critical step towards protecting public health, strengthening the economy, safeguarding animal welfare, facilitating international trade, and promoting sustainable development. This will be supported through: (a) **allocation of funds to strengthen surveillance and reporting systems**, (b) **conduct mass vaccination campaigns**, (c) **implement education and awareness programs,** (d) **strengthen animal control measures, and** (e) **invest in research and development**. This will significantly impact the reduction of rabies cases, safeguarding public health, and ensuring a safer future for its citizens leading to a rabies-free Yemen. An effective strategy for prevention and control of rabies in Yemen should encompass a comprehensive approach that addresses both animal and human rabies. The prevention and control strategy could use the following items:

National Rabies control strategy

A.	**Strengthening Surveillance and Reporting Systems**
–	Establish a nationwide rabies surveillance network that includes veterinary clinics, animal shelters, and human health facilities.
–	Develop standardized reporting forms for suspected rabies cases in both animals and humans.
–	Utilize electronic data management systems to collate and analyze rabies surveillance data.
–	Conduct regular data analysis to identify trends, patterns, and areas of high rabies incidence.
–	Disseminate surveillance data to relevant stakeholders for informed decision-making and resource allocation.
B.	**Mass Vaccination Campaigns**
–	Develop a comprehensive vaccination plan that targets areas with high rabies prevalence and prioritizes susceptible animal populations.
–	Ensure the availability of high-quality rabies vaccines that meet international standards.
–	Mobilize veterinary teams and community volunteers to conduct mass vaccination campaigns.
–	Implement incentives and outreach programs to encourage animal owners to participate in vaccination campaigns.
–	Monitor the effectiveness of vaccination campaigns through serological surveys and disease incidence data.
C.	**Education and Awareness Programs**
–	Develop targeted educational materials and programs for different audiences, including animal owners, community members, healthcare workers, and veterinarians.
–	Utilize various communication channels, such as radio, television, social media, and printed materials, to disseminate rabies prevention messages.
–	Conduct workshops and training programs for animal owners on rabies prevention, vaccination, and bite management.

	– Engage with community leaders and religious organizations to promote rabies awareness and encourage participation in prevention efforts.
	– Collaborate with schools and educational institutions to incorporate rabies prevention education into curricula.
D.	Strengthening Animal Control Measures
	– Implement effective stray animal management programs, including humane capture, sterilization, and release initiatives.
	– Enforce animal registration and vaccination requirements to maintain a record of animal ownership and vaccination status.
	– Collaborate with local authorities to implement strict regulations on animal importation and movement to prevent rabies introduction from neighboring areas.
	– Establish animal shelters and foster care programs to provide temporary housing for stray or abandoned animals.
	– Conduct regular inspections of animal shelters and breeding facilities to ensure compliance with animal welfare standards.
E.	Research and Development
	– Support research on rabies epidemiology, transmission dynamics, and vaccine development.
	– Encourage collaboration between local and international researchers to share expertise and resources.
	– Conduct studies to identify risk factors for rabies transmission and evaluate the effectiveness of prevention and control strategies.
	– Develop innovative approaches to rabies prevention, such as oral vaccination campaigns or wildlife population management strategies.
	– Promote the development of new diagnostic tools and technologies to facilitate early detection and rapid response to rabies outbreaks.

Budget for the programmes

224. With an estimated annual budget of **USD 5 million** allocated per year to the strategy for prevention and control of rabies, it is crucial to carefully distribute these funds to ensure maximum impact.

225. To effectively control rabies, it is essential to enhance surveillance and reporting systems across Yemen. This requires investing USD 800.000 in establishing a robust network of reporting units, laboratories, and data management systems. These funds can be utilized to train healthcare professionals, veterinarians, and community workers in identifying and reporting rabies cases promptly. Resources should be allocated to establish a centralized database for accurate data collection, analysis, and real-time monitoring of rabies cases. Mass vaccination campaigns play a pivotal role in preventing the spread of rabies among both human and animal populations. Allocating USD 2.2 million to this aspect of the strategy would facilitate the acquisition and distribution of vaccines across Yemen. These funds can cover the cost of procuring vaccines, cold chain storage infrastructure, transportation, and personnel training. The focus should be on reaching remote areas, where access to veterinary services is limited, and conducting regular vaccination drives for both domestic animals and stray dogs.

226. Raising awareness about rabies and its prevention is vital for long-term control. Allocating USD 1 million towards education and awareness programs would allow for the development and implementation of comprehensive campaigns. These funds can be utilized to train healthcare

professionals, veterinarians, and community workers in educating the public about rabies transmission, prevention methods, and the importance of timely vaccination. Public outreach initiatives, such as media campaigns, workshops, and school programs, could be conducted to disseminate information and debunk common myths surrounding rabies. Controlling the population of stray dogs is crucial in reducing the transmission of rabies to humans. Allocating USD 500.000 towards strengthening animal control measures will enable the establishment and maintenance of well-equipped animal shelters, veterinary clinics, and dog catch-and-release programs. These funds should be utilized to train animal control officers, provide necessary equipment, and implement sterilization programs to manage the stray dog population effectively.

227. Investing in research and development is vital for the long-term success of rabies prevention and control strategies. Allocating USD 500.000 towards research would enable the exploration of innovative approaches, such as oral vaccination methods for stray animals, improved diagnostic tools, and the development of cost-effective vaccines. These funds should support research institutions, encourage collaboration between local and international experts, and facilitate the implementation of clinical trials and studies to improve rabies control measures in Yemen.

Table 7. Budget for programmes under pillar 2 (2024-2034)

Programmes (USD million)	Total annual Budget	Total Budget (2024-2034)
Total Pillar 2	67.6	676
Programme 2.1: Development of a National Strategy to Control and Eradicate Peste des Petits Ruminants (PPR)	9.35	93.5
Programme 2.2: Implementation of Prevention and Control measures for sheep and goat pox outbreaks	2	20
Programme 2.3: Implementation of a National Foot and Mouth Disease Control Strategy	10	100
Programme 2.4: Establishment of Preventive and control measures for an effective control of Lumpy Skin Disease	5.25	52.5
Programme 2.5: Implementation of an Animal brucellosis Control and eradication Strategy	8	80
Programme 2.6: National Strategy for Prevention and Control of Avian Influenza	14	140
Programme 2.7: National Strategy for Prevention and Control of Rift Valley fever	7	70
Programme 2.8: National Strategy for Prevention and Control of Clostridial infection	7	70
Programme 2.9: National Strategy for Prevention and Control of Rabies	5	50

Strategic Pillar 3: Prevent, detect and respond to health issues at the interfaces between humans, animals and the environment

Objective: *The health and safety of both animals and humans will be ensured by 2034, leading to comprehensive monitoring systems implemented to track potential public health threats from animals, bolstered by sophisticated data analysis tools.*

228. These interfaces are common breeding grounds for zoonotic diseases, where pathogens can jump from animals to humans. Proper management of these interactions requires a multi-faceted approach that includes early detection, effective surveillance systems, and robust communication networks among relevant stakeholders such as healthcare providers, veterinarians, environmental scientists, and policy makers. By implementing preventive measures like animal vaccination programs, habitat preservation, strict hygiene practices in food production systems, and adequate waste management strategies, we can significantly reduce the risk of disease transmission. Additionally, promoting interdisciplinary research collaborations and international cooperation will enable us to identify emerging health threats more efficiently and develop appropriate response mechanisms globally. Ultimately, by recognizing the interconnectedness between human health, animal well-being, and ecosystem integrity, we can proactively address health issues at these interfaces to safeguard public health while preserving biodiversity.

Theory of change (Pillar 3): The health issues at the interfaces between humans, animals and the environment will be prevented, detected and responded to through the promotion and operationalization for One Health approaches supported by national partners, technical institutions, international organizations, and donors. One Health Integration and Balance emphasizes the importance of collaboration between different sectors, such as human health, veterinary medicine, agriculture, and environmental sciences, to achieve optimal health outcomes for all. By recognizing the interdependencies between these sectors, the aims to prevent and control diseases, promote sustainable development, and enhance overall well-being. Implementing One Health Integration and Balance enables the early detection and control of zoonotic diseases, plays a crucial role in mitigating the risks associated with emerging diseases, including those caused by antimicrobial resistance (AMR). This approach promotes the judicious use of antibiotics in both human and animal health settings, reducing the risk of antimicrobial resistance, a growing global health threat. Investing in surveillance systems is essential. Establishing a robust disease surveillance network, both at the human and animal level can enable early detection and response to outbreaks. Capacity-building programs should be initiated to enhance the skills and knowledge of healthcare professionals, veterinarians, and agricultural workers. This can be achieved through training programs, workshops, and knowledge exchange initiatives, fostering a culture of collaboration and integration.

Programme 3.1: Quarantine and Movement Control

229. Quarantine and movement control measures play a crucial role in safeguarding animal health, preventing the spread of diseases, and mitigating economic losses. This programme focuses on investing in establishing a structured and administered quarantine and movement control system in animal health crucial for preventing the spread of infectious diseases among animals. This will be supported through: (a) **Strengthening infrastructure and resources;** (b) **Enhancing awareness and education;** (c) **Strengthening legislation and enforcement;** (d) **International collaboration and partnerships.** This system should encompass legislative and policy frameworks, risk assessment, surveillance mechanisms, proper infrastructure, traceability measures, and educational initiatives. Evidence from various countries demonstrates the efficacy of such measures in safeguarding animal health, enhancing trade relationships, and protecting public health. By prioritizing and implementing these measures, Yemen can mitigate the risks associated with animal diseases, ensuring the sustainability of the livestock industry and the well-being of its populations.

Programme 3.2: Standards for Veterinary Facilities and Equipment

230. Implementing standards ensures the provision of high-quality healthcare services for animals, leading to improved animal welfare and reduced morbidity and mortality rates. Standardized facilities and equipment facilitate accurate diagnoses and effective treatment, resulting in better treatment outcomes. This programme focuses on enhancing the country's reputation in the global market and fosters economic growth. Implementing standards for veterinary facilities and equipment in Yemen is not without its challenges. This will be supported through: (a) **raising awareness among stakeholders;** (b) **collaborating and coordinating;** (c) **providing incentives to veterinary professionals.** Yemen can establish a robust animal disease prevention and intervention system, safeguarding livestock and promoting economic growth. This can be achieved through enhanced disease surveillance, early detection, and rapid response mechanisms, ultimately minimizing economic losses associated with animal diseases. By incentivizing these professionals, the government can attract and retain skilled veterinarians, ensuring a robust workforce dedicated to combating animal diseases.

Programme 3.3: Biosecurity measures for disease prevention and control

231. Biosecurity measures act as a first line of defence against the introduction and spread of infectious diseases within animal populations. This programme focuses on implementing strict protocols, such as quarantine procedures, vaccination programs, and proper waste management, in order to significantly reduce the likelihood of disease outbreaks. This will be supported through: (a) **strengthening veterinary services,** (b) **collaborating and international support;** (c) **awareness and education campaigns.** by implementing biosecurity measures, the potential transmission of such diseases can be minimized, protecting both public health and the livelihoods of individuals reliant on animal products. In Yemen the introduction of effective biosecurity measures will ensure the protection of livestock, reducing economic losses due to disease outbreaks and enhancing the sector's sustainability.

Programme 3.4: Early Warning Systems

232. By providing early detection, Early Warning Systems enable rapid response and containment, minimizing the impact of disease outbreaks on animal populations and human livelihoods. The country's political instability and ongoing conflict have disrupted veterinary services, making it difficult to track and respond to disease outbreaks effectively. The country's geographical location and high livestock density create an ideal environment for disease transmission, necessitating proactive measures to prevent and control outbreaks. This programme focuses on investing in establishing an effective early warning systems in Yemen's animal health sector. This will be supported through: (a) **integration/update the technologies and data management systems**; and (b) **establishment/strengthen effective communication channels and coordination mechanisms among relevant stakeholders.** Regular information sharing, joint training exercises, and public awareness campaigns can enhance the effectiveness of early warning systems.

Programme 3.5: Epidemiological Investigations

233. Epidemiological investigations play a crucial role in understanding and controlling diseases in animals, thereby safeguarding public health and ensuring sustainable agricultural practices. This programme focuses on investing in assessing the risk of zoonotic diseases, which can pass from animals to humans, further emphasizing the importance of robust epidemiological investigations in animal health. This will be supported through: (a) **strengthening early warning system and information sharing for livestock vector-borne diseases (food safety and AMR);** (b) **tackling major diseases such as antimicrobial resistance;** (c) **strengthening the capacities to address complex multidimensional health risks with more resilient health systems;** (d) **fostering multisectoral coordination/collaboration mechanisms with human medicine, veterinary medicine, and environmental health sciences.** By collecting and analyzing data on disease prevalence, mortality rates, and risk factors, surveillance systems provide valuable insights into the epidemiology of diseases. This information helps identify high-risk areas, vulnerable animal populations, and potential transmission routes. Consequently, public health interventions can be targeted, and resources allocated more efficiently.

Programme 3.6: Promoting public awareness about the importance of animal health.

234. Inadequate animal health practices can facilitate the transmission of these diseases, leading to increased morbidity and mortality rates among the population. An informed public can play an active role in preventing the spread of diseases. By understanding the importance of vaccination, biosecurity measures, and proper animal husbandry practices, individuals can contribute to disease prevention at the local level. This programme focuses on promoting public awareness on animal illness prevention and intervention strategies. This will be supported through: (a) **developing educational campaigns;** (b) **empowering local veterinarians;** (c) **encouraging community participation;** (d) **developing educational materials and resources;** (e) **leveraging technology for outreach;** and (f) **establishing networking platforms.** Awareness campaigns can foster behavioral changes among livestock owners, encouraging them to adopt sustainable animal health practices. By providing information on disease

prevention, early detection, and appropriate treatment, farmers can minimize the impact of diseases on their livestock, thereby increasing productivity. This, in turn, contributes to food security and economic stability in the country.

Budget for the programmes

235. Addressing prioritized livestock diseases, quarantine and movement control, vaccination against priority animal diseases, standards for veterinary facilities and equipment, biosecurity measures for disease prevention and control, and promoting public awareness about the importance of animal health requires a significant financial commitment. Based on thorough research, it is estimated that a total annual budget of approximately **USD 19.87 million** would be necessary. Allocating these funds to the respective areas would enable Yemen's animal health services to effectively combat diseases, ensure livestock welfare, and contribute to the sustainable development of the livestock industry in the country.

236. To prevent the introduction and spread of diseases, an efficient quarantine and movement control system is essential. This involves establishing quarantine facilities, training personnel, conducting regular inspections, and implementing strict regulations for the movement of livestock. Considering the scale and scope of Yemen's livestock industry, a budget of approximately USD 1.65 million would be required to establish and maintain an effective quarantine and movement control system.

237. The presence of well-equipped veterinary facilities is vital for providing quality healthcare services to animals. Upgrading existing veterinary clinics, establishing new facilities, procuring necessary equipment, and ensuring adequate staffing are crucial steps toward achieving this goal. Research suggests that a budget of approximately USD 3.3 million would be required to meet the standards for veterinary facilities and equipment in Yemen.

238. Biosecurity measures play a pivotal role in preventing the introduction and spread of diseases within livestock populations. This includes measures such as controlled access to farms, proper waste management systems, and regular disinfection protocols. Allocating funds for training programs, infrastructure development, and awareness campaigns would be essential. Based on extensive research, a budget of approximately USD 2.9 million would be needed to implement effective biosecurity measures in Yemen.

239. Enhancing animal health surveillance involves strengthening the existing systems and implementing new technologies to monitor and detect diseases effectively. This includes establishing a network of surveillance units across the country, equipped with necessary diagnostic tools and trained personnel. Investment in laboratory infrastructure, such as upgrading equipment and ensuring a reliable power supply, is imperative. The estimated budget for enhancing animal health surveillance in Yemen is approximately USD 6.45 million.

240. To achieve sustainable improvements, investing in training and capacity building is essential. This includes workshops, seminars, and hands-on training for veterinary professionals on disease surveillance techniques, laboratory diagnostics, and data analysis. Supporting academic programs to produce skilled professionals and fostering international collaborations for knowledge exchange is crucial. Allocating around USD 4.51 million for training and capacity building would be appropriate.

241. Raising public awareness about the significance of animal health is crucial for garnering support and cooperation in disease prevention and control efforts. This requires developing educational materials, organizing awareness campaigns, and conducting training sessions for livestock farmers and the general public. To effectively promote public awareness, an estimated budget of USD 1.06 million would be necessary.

Table 8. Budget for programmes under pillar 3 (2024-2034)

Programmes (USD million)	Total annual Budget	Total Budget (2024-2034)
Total Pillar 3	19.87	198.7
Programme 3.1: Quarantine and Movement Control	1.65	16.5
Programme 3.2: Standards for Veterinary Facilities and Equipment	3.3	33
Programme 3.3: Biosecurity measures for disease prevention and control	2.9	29
Programme 3.4: Early Warning Systems	6.45	64.5
Programme 3.5: Epidemiological Investigations	4.51	45.1
Programme 3.6: Promoting public awareness about the importance of animal health	1.06	10.6

Strategic Pillar 4: Boost emergency readiness for key animal diseases and livestock calamities caused by climate change.

Objective: *Emergency readiness for key animal diseases and livestock calamities caused by climate change will be boosted by 2034 leading to enhanced stakeholder collaboration to develop comprehensive strategies aimed at early detection, rapid response, and effective management of challenges*

242. Investing in emergency readiness for key animal diseases and livestock calamities caused by climate change in Yemen is of paramount importance. Such investments would not only protect the livelihoods of farmers and ensure food security but also contribute to the overall stability of the country. Enhancing existing surveillance systems to monitor the occurrence and spread of animal diseases can be achieved through the establishment of a network of veterinary laboratories equipped with advanced diagnostic tools, in conjunction with a robust information-sharing mechanism among relevant stakeholders. Investing in the training and capacity building of veterinarians and animal health professionals is essential for effective disease control and prevention. Ensuring the availability and accessibility of veterinary medicines, vaccines, and diagnostic tools is crucial to combat emerging diseases effectively. Promoting climate-smart livestock management practices can help mitigate the impacts of climate change on animal health. These practices include improved feeding and nutrition strategies, provision of shade and shelter, and the development of water management systems to ensure adequate hydration for livestock even during periods of drought. Engaging local communities in raising awareness about the impacts of climate change on livestock and the importance of

emergency preparedness can be achieved through targeted education campaigns, training workshops, and the establishment of community-based organizations to facilitate information exchange and response coordination.

Theory of change (Pillar 4): Emergency readiness for key animal diseases and livestock calamities caused by climate change will be boosted through improvements in Contingency Planning. As the effects of climate change become more pronounced, it is crucial to anticipate and prepare for potential outbreaks or disasters that could significantly impact animal health and agricultural systems. collaboration between different stakeholders is essential in strengthening Contingency Planning. This collaborative approach can help identify best practices, develop standardized protocols for disease surveillance and response, and ensure a coordinated response during emergencies. Investing in the animal health sector is not only essential for safeguarding livestock but also for ensuring food security, public health, and sustainable development in Yemen.

Programme 4.1: Disease Notification and Reporting

243. To improve disease notification and the establishment of a comprehensive and standardized reporting system is essential. This system should include all healthcare facilities, laboratories, and community health workers, ensuring that data is collected uniformly and consistently. This programme focuses on investing in establishing a robust surveillance system that supports the identification of priority areas for resource allocation, ensuring that limited healthcare resources are allocated efficiently. This will be supported through: (a) **establishing a structured and administered surveillance system;** (b) **raising awareness among farmers and livestock owners about the importance of disease reporting; and** (c) **promoting disease management and control.** Enhanced disease reporting would contribute to the overall strengthening of Yemen's health system, enabling it to better respond to both acute and chronic health issues. It would also facilitate the collection of accurate data, enabling evidence-based decision-making and the effective evaluation of public health interventions.

Programme 4.2: Contingency planning in animal health

244. Contingency planning must include mechanisms for rapid response during disease outbreaks or emergencies. This entails establishing emergency response teams, stockpiling essential veterinary supplies, establishing quarantine facilities, and implementing movement control measures. Adequate financial resources must be allocated to ensure efficient emergency response, including the procurement of emergency veterinary supplies, establishing and maintaining response teams, and logistical support. This programme focuses on investing in establishing effective surveillance systems to detect early signs of disease outbreaks and ensuring access to veterinary services and essential medicines. This will be supported through: (a) **strengthening surveillance and early warning systems;** (b) **enhancing emergency response capacity;** (c) **promoting sustainable practices;** (d) **promoting collaboration and coordination;** (e) **strengthening vector control measures.** Developing strategies to

strengthen these services, including training local veterinarians and providing necessary equipment and medications, is vital for maintaining animal health.

Budget for the programmes

245. Addressing the emergency readiness for key animal diseases and livestock calamities requires a comprehensive budget. Based on the aforementioned factors, an approximate total budget of **USD 11.94 million** annually would be necessary to implement these initiatives effectively. It is crucial to acknowledge that this estimation may vary depending on the evolving needs and challenges.

246. Efficient data-sharing platforms are vital for effective disease prevention and control. In Yemen, establishing a comprehensive data-sharing platform requires investment in digital infrastructure, including servers, connectivity, and software development. Building partnerships with relevant stakeholders, such as governmental agencies, non-governmental organizations, and international bodies, is also essential. The estimated budget for strengthening data-sharing platforms is approximately USD 1,54 million.

247. Addressing contingency planning in the animal health sector in Yemen requires a well-funded and comprehensive approach to mitigate the impact of ongoing conflict and economic challenges. The estimated budget of USD 10.4 million annually should encompass surveillance and monitoring systems, vaccination campaigns, capacity building, and emergency response strategies. It is important to note that this is a rough estimate, and the actual budget may vary depending on the prevailing socioeconomic conditions, the scale of interventions, and the duration of the contingency plan.

Table 9. Budget for programmes under pillar 4 (2024-2034)

Programmes (USD million)	Total annual Budget	Total Budget (2024-2034)
Total Pillar 4	11.94	119.4
Programme 4.1: Disease Notification and Reporting	1.54	15.4
Programme 4.2: Contingency planning in animal health	10.40	104.0

Strategic Pillar 5: Establish long-term frameworks for prompt and consistent coordination

Objective: Long-term frameworks for prompt and consistent coordination will be established by 2034, ensuring that animals are properly cared for, receive necessary vaccinations and treatments, and are protected from diseases and infections.

248. Investing in long-term frameworks for prompt and consistent coordination of animal disease activities enables the establishment of robust disease surveillance systems. These systems play a pivotal role in detecting disease outbreaks early, allowing for rapid response measures. Such initiatives require long-term investments to ensure their effectiveness and sustainability. Coordination frameworks facilitate the development of effective response and control measures for animal

diseases. By establishing long-term partnerships and collaborations between relevant stakeholders, including governments, veterinary services, researchers, and international organizations, a coordinated approach can be adopted. This approach allows for the sharing of resources, expertise, and information, leading to more prompt and effective responses. Investing in the establishment of long-term frameworks for the coordination of animal disease activities brings substantial economic benefits.

Theory of change (Pillar 5): Emergency readiness for key animal diseases and livestock calamities caused by climate change will be boosted through improvements in funding of veterinary services and related institutions; investing in scientific research and development to enhance understanding of animal diseases. Emergency readiness for key animal diseases and livestock calamities caused by climate change necessitates improvements in funding for veterinary services and related institutions, alongside investments in scientific research and development. It is crucial to improve funding for veterinary services and related institutions while investing in scientific research and development. By doing so, we can enhance emergency readiness and response, mitigate the impact of animal diseases, and safeguard the livelihoods of farmers and the broader agricultural sector.

Programme 5.1: Funding of veterinary services and related institutions

249. Funding plays a pivotal role in addressing the challenges faced by veterinary services in Yemen. Adequate financial resources are required to improve infrastructure, enhance training and education programs, procure necessary equipment and medicines, and establish effective disease surveillance systems. This programme focuses on investing in research and development to tackle emerging diseases and promote preventive measures within the livestock sector. This will be supported through: (a) **ensuring sufficient funding;** (b) **partner with government agencies;** (c) **collaborating with private organizations such as animal welfare organizations and veterinary associations;** (d) **raising public awareness about the importance of animal health care.** Securing adequate funding is a significant challenge for resource mobilization. Establishing partnerships with private sector entities, both nationally and internationally, can help ensure sustainable funding for future outbreaks.

Programme 5.2: Investing in scientific research and development to enhance understanding of animal diseases.

250. To effectively enhance understanding of animal diseases and improve animal health in Yemen, investing in scientific research and development is crucial. This funding can be utilized to support research projects, procure necessary equipment and supplies, and provide scholarships for Yemeni students to pursue higher education in veterinary medicine and related fields. This programme focuses on investing in research, that can enhance animal health, increase productivity, and ensure a steady supply of safe and nutritious animal products like meat, milk, and eggs. This will be supported through: (a) **increasing funding for research;** (b) **promoting collaboration and knowledge exchange;** (c) **promoting interdisciplinary research among veterinary and medical scientists;** (d) **raising public awareness about the importance of scientific research and development related to animal diseases**. By implementing these strategies, investing in scientific research and development related to animal

diseases can be promoted, which can have a positive impact on animal health, food security, and public health.

Budget for the programmes

251. Addressing the funding challenges for veterinary services and investing in scientific research and development to enhance the understanding of animal diseases in Yemen requires a comprehensive budget. Based on the aforementioned factors, an estimated total budget of **USD 81.28 million** annually would be necessary to implement these initiatives effectively. It is crucial to acknowledge that this estimation may vary depending on the evolving needs and challenges.

252. To ensure the provision of quality veterinary services, it is essential to address the funding challenges faced by Yemen. A comprehensive budget must be allocated to overcome these obstacles and improve veterinary services. Training and education play a crucial role in developing a skilled workforce in the veterinary field. Allocating funds for scholarships, workshops, and specialized training programs would require an approximate budget of USD 7 million. Providing veterinary clinics and laboratories with essential equipment, diagnostic tools, and medicines is vital. An estimated budget of USD 14 million would be necessary to ensure a steady supply of these resources. Conducting Outreach awareness campaigns to educate farmers, herders, and the general public about animal health, disease prevention, and proper animal husbandry practices is crucial. Allocating funds for such programs would require a budget of approximately USD 2.28 million.

253. Enhancing the understanding of animal diseases through scientific research and development is a fundamental aspect of improving veterinary services in Yemen. By investing in this field, Yemen can mitigate the impact of various diseases and develop effective prevention and control strategies. Establishing research facilities equipped with modern technology and adequate resources is essential. Allocating a budget of USD 29 million for the construction and maintenance of research facilities would facilitate impactful scientific studies. Encouraging local researchers to conduct studies on animal diseases and their prevention necessitates providing research grants. An estimated budget of USD 17.4 million should be allocated to support research projects, thereby fostering innovative solutions. Collaborating with international organizations, universities, and research institutions can greatly enhance scientific research capabilities in Yemen. Allocating funds for collaborative projects and partnerships would require a budget of approximately USD 8.7 million. Establishing a comprehensive database to collect, analyze, and disseminate information on animal diseases is essential for effective decision-making. Allocating a budget of USD 2.9 million for the development and maintenance of such a database would be necessary.

Table 10. Budget for programmes under pillar 5 (2024-2034)

Programmes (USD million)	Total annual Budget	Total Budget (2024-2034)
Pillar 5	81.28	812.8
Programme 5.1: Funding of veterinary services and related institutions	23.28	232.8
Programme 5.2: Investing in scientific research and development to enhance understanding of animal diseases	58.00	580

The YAHSIP structure

254. The figure below provides a structure of the Yemen Animal Health Strategy and Investment Plan, with its relationships between the objective, strategic pillars, and individual investment programmes. Understanding this structure helps navigate the plan and gain a deeper understanding of how different elements fit together to achieve the overall objective of a healthier and more resilient animal sector in Yemen.

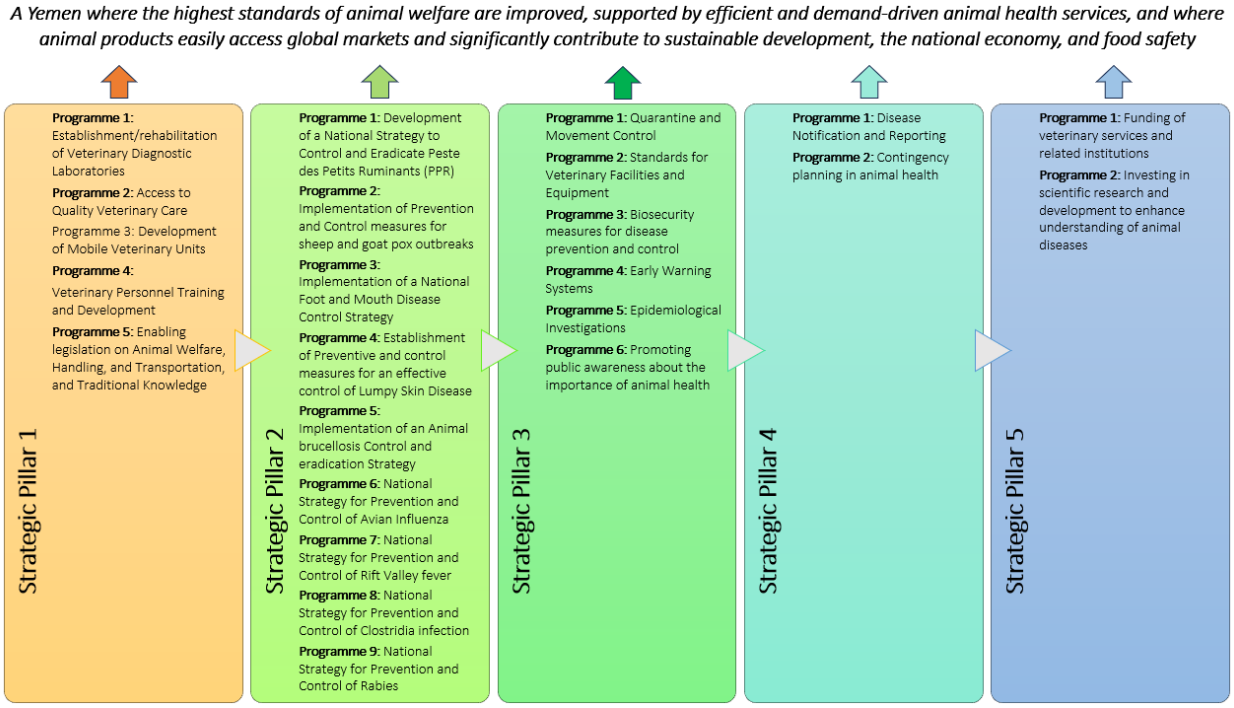

Figure 10: The YAHSIP structure, its twenty-three results grouped into five pillars.

The budget allocation

255. An overall cost of **2031.1 million USD** is the estimated amount required to achieve the five pillar's results. The budget allocation demonstrates a balanced approach with clear priorities. It prioritizes disease prevention, invests in long-term capacity building, acknowledges emerging challenges, and emphasizes collaboration for the plan's successful implementation. It's important to note that the budget allocation is just one aspect of effective implementation. Monitoring progress, adapting to changing circumstances, and ensuring responsible resource management will be crucial for achieving the plan's ambitious goals.

Table 11. Budget for programmes (2024-2034)

Pillars (USD million)	Total Budget
Strategic Pillar 1: Improve the capacity of national veterinary institutes to deliver efficient animal health services	**224.3**
Programme 1.1: Establishment/rehabilitation of Veterinary Diagnostic Laboratories	55.5
Programme 1.2: Access to Quality Veterinary Care	82

Programme 1.3: Development of Mobile Veterinary Units	27
Programme 1.4: Veterinary Personnel Training and Development	40.8
Programme 1.5: Enabling legislation on Animal Welfare, Handling, and Transportation, and Traditional Knowledge	19
Strategic Pillar 2: Improve disease prevention and control strategies for safe animal health delivery	**676**
Programme 2.1: Development of a National Strategy to Control and Eradicate Peste des Petits Ruminants (PPR)	93.5
Programme 2.2: Implementation of Prevention and Control measures for sheep and goat pox outbreaks	20
Programme 2.3: Implementation of a National Foot and Mouth Disease Control Strategy	100
Programme 2.4: Establishment of Preventive and control measures for an effective control of Lumpy Skin Disease	52.5
Programme 2.5: Implementation of an Animal brucellosis Control and eradication Strategy	80
Programme 2.6: National Strategy for Prevention and Control of Avian Influenza	140
Programme 2.7: National Strategy for Prevention and Control of Rift Valley fever	70
Programme 2.8: National Strategy for Prevention and Control of Clostridia infection	70
Programme 2.9: National Strategy for Prevention and Control of Rabies	50
Strategic Pillar 3: Prevent, detect and respond to health issues at the interfaces between humans, animals and the environment	**198.7**
Programme 3.1: Quarantine and Movement Control	16.5
Programme 3.2: Standards for Veterinary Facilities and Equipment	33
Programme 3.3: Biosecurity measures for disease prevention and control	29
Programme 3.4: Early Warning Systems	64.5
Programme 3.5: Epidemiological Investigations	45.1
Programme 3.6: Promoting public awareness about the importance of animal health	10.6
Strategic Pillar 4: Boost emergency readiness for key animal diseases and livestock calamities caused by climate change	**119.4**
Programme 4.1: Disease Notification and Reporting	15.4
Programme 4.2: Contingency planning in animal health	104.0
Strategic Pillar 5: Establish long-term frameworks for prompt and consistent coordination	**812.75**
Programme 5.1: Funding of veterinary services and related institutions	232.75
Programme 5.2: Investing in scientific research and development to enhance understanding of animal diseases	580
The YAHSIP investment budget for the period 2024-2034	***2031.1***

256. The budget allocation is well-aligned with the plan's priorities and objectives. The analysis below shows how each pillar's budget aligns with its corresponding goals.

Table 12. Analysis on how the budget aligns with the plan's priorities and objectives

	Allocation	Alignment with objectives
Capacity Building for National Veterinary Institutes (11%)	Moderate: This acknowledges the importance of a strong	This budget enables investments in equipment, training for veterinary professionals, and institutional development, enhancing national

	foundation for animal health services.	veterinary institutes' ability to deliver efficient services.
Disease Prevention and Control (33%)	High: This reflects the urgency of addressing prevalent and potential animal diseases to safeguard public health, livestock productivity, and the economy.	This budget allows for investments in surveillance systems, laboratory infrastructure, vaccination programs, and training for veterinary personnel, directly contributing to disease control goals.
One Health Approach (10%)	Significant: This recognizes the interconnectedness of human, animal, and environmental health.	This budget allows for research on zoonotic diseases, training for healthcare professionals, and community-based interventions, furthering the plan's commitment to a One Health approach.
Climate Change and Emergency Preparedness (6%)	Focus on emerging challenges: This allocation indicates foresight in addressing new threats to animal health posed by climate change.	This budget allows for investments in drought and flood mitigation measures, disease surveillance in changing environments, and community resilience building, contributing to the plan's preparedness goals.
Coordination and Collaboration (40%)	Largest allocation: This emphasizes the critical role of partnerships and communication in achieving the plan's goals.	This budget enables stakeholder engagement, inter-agency collaboration, and knowledge sharing, ensuring everyone works towards the shared vision of a healthy animal sector.

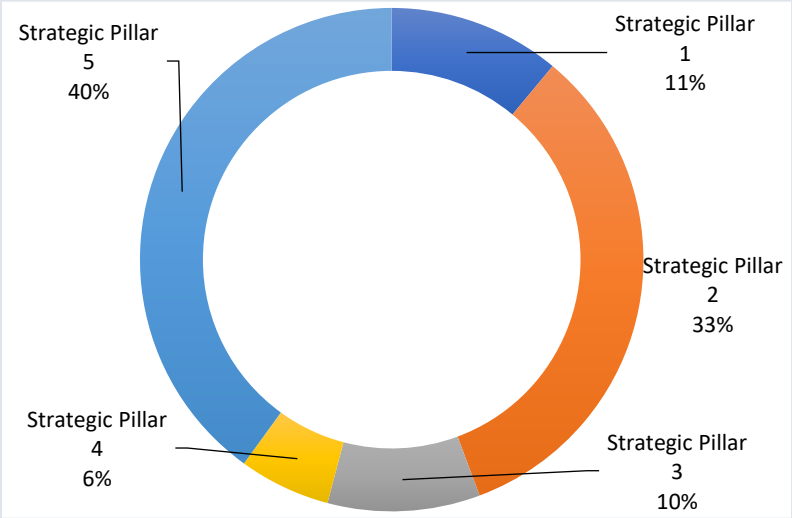

Figure 11: Overview of the proportion of the 5 pillars within the YAHSIP

257. The percentages given can be interpreted as a rough allocation of focus and resources. Specific budgets and implementation details might differ. It's important to remember that these pillars are interlinked and contribute to each other. For example, improved veterinary institutes will enhance disease prevention efforts.

8. STRATEGY IMPLEMENTATION

258. Delivering the YAHSIP is dependent on a strong partnership approach between all the stakeholders in animal health and welfare. The Government has a crucial role to play in delivering a wide range of activities. The Implementation concentrates on how the Government will play its part in putting the strategy into practice. Other stakeholders are encouraged to reflect on their contributions to the partnership approach.

259. This section sets out the framework for measuring the success of the strategy. The framework will provide indicators and specific goals and milestones for delivery. Progress will be measured, monitored and communicated over the lifetime of the strategy and evaluation studies will be carried out to measure the impact of the policies. There will be an annual reporting process that will ensure transparent communication of progress with the strategy.

8.1 Governance of the YAHSIP

260. The governance structure considers the requirements for achieving the impact and long-term outcomes of the YAHSIP, as well as the medium- and immediate short-term outcomes. It ensures the provision of platforms and opportunities to engage all relevant stakeholders, mobilize action and resources and address the complex challenges outlined in the Strategic Pillars. The governance is to improve/build on the existing mechanisms and avoid creating unnecessary and complex structures. Existing structures will be used to ensure input into the local and regional delivery of this strategy rather than creating new overlapping arrangements. This will need to reflect the wider role that animal health and welfare play as a key component of the whole sustainable agriculture and rural agenda. The governance structure of the YAHSIP should demonstrate a comprehensive and well-organized approach to address the challenges facing the country's animal health sector.

261. The Ministry of Agriculture and Irrigation (MAI) and Ministry of Agriculture, Irrigation and Fisheries (MAIF) play a pivotal role in the governance structure of the YAHSIP. They is responsible for the overall coordination, implementation, and monitoring of the animal health programmes. It works closely with other relevant ministries, such as the Ministry of Health and the Ministry of Environment, to ensure a holistic and integrated approach to animal health management. By continually refining and adapting this governance structure based on emerging issues and lessons learned, MAI is poised to make significant strides in improving animal health and safeguarding the well-being of the population.

262. The strategy will be managed through a partnership between stakeholders and Government. The key components to be put in place include:

- A Strategy Steering Board of representatives from across the animal health and welfare sector, and Government officials tasked with providing strategic guidance and direction on the prioritization, development and communication of the strategy.
- A Technical Group to provide an annual overview on scientific issues to the Strategy Steering Board.

These components will provide a transparent framework for discussions on the policy priorities, direction, delivery arrangements, and progress of the strategy to take place.

8.2 Monitoring and Evaluation

263. Effective monitoring and evaluation (M&E) of the YAHSIP remains an essential function in providing critical information and evidence regarding the performance of the strategic options implemented at the national level. The overarching aim of the M&E framework is to provide an integrated, encompassing framework of M&E principles, practices and standards. The intention of this is to provide an evidence base for resource allocation decisions and to help identify how challenges will be addressed and successes replicated. The framework will also assists in strengthening program planning and improving the effectiveness of actions and interventions implemented through the YAHSIP.

264. The essence of the M&E in this process is to assist stakeholders in evaluating performance at all levels and identify factors that contribute towards the desired outcomes. The M&E framework will be designed as a pivotal competence that will have positive effects both up and downstream. It will provide the users with the ability to draw causal connections between the choice of interventions, their resourcing, their implementation design, and their ultimate impact on livestock communities.

265. It will be regularly updated in consultation with stakeholders, to ensure that the strategy adapts to a continually changing environment. To measure progress towards the strategy's vision there needs to be a clear and common understanding of the baseline from which we are starting and the outcomes and targets we are aiming for. The Evidence Base also provides details of the work currently in progress to develop a framework of indicators that will measure the strategy's progress towards its objectives. The indicators will help to guide policy, inform priorities, target resources and focus discussion.

8.3 Risk Analysis Framework

266. The Risk Analysis Framework is an important tool for managing risks associated with animal health and food safety. It helps to estimate the probability of and the consequences of infectious disease incursion to disease-free in the country through legal or illegal trade or via the movements. It as well helps to identify hazards, assess risks, implement risk management measures, and communicate risks effectively.

267. In the context of animal health in Yemen, this framework would allow for the identification of potential risks, their likelihood of occurrence, and the severity of their impact on animal health. By utilizing this framework, policymakers and experts can develop effective strategies to prevent, control, and manage these risks, thereby safeguarding the animal population and minimizing economic losses.

Table 13: Risk Analysis Framework

Risk Factor	Probability of risk (1-3)	Impact of risk (1-3)	Risk factor (1-9)	Mitigation measures
Livestock pests and diseases	3	3	9	– Vaccination – Livestock movement control – Treatment and pesticide application
Security concerns in livestock producing areas	3	3	8	– Peace initiatives – Initiate livestock Development project – Cultural re-engineering will be promoted though community engagement, policy and law.
Drought	2	1	4	– Develop programmes/projects that build resilience to drought prone communities – Enhance early warning systems – Develop appropriate contingency plans
Pandemic	2	1	2	– Vaccination – Quarantine – Awareness
Transboundary diseases from neighboring countries of unknown or indeterminate disease status	3	2	5	– Enhance regional disease control – initiatives and strengthen border-point surveillance
Shift of international trading protocols	1	1	2	– Engage more with trading partners through membership to regional and international trade groupings – Anticipate emerging sanitary standards and implement them upfront to avoid disruption of trade
Climate Change	3	2	7	– Mainstream climate change adaptation and mitigation strategies in design, implementation and M&E of programmes and projects
Limited resources	3	3	8	– Foster partnerships with relevant stakeholders, including governmental agencies, non-governmental organizations, and private entities
Inadequate veterinary infrastructure	2	2	7	– Seek assistance from international organizations – Advocate for the development and improvement of veterinary infrastructure
Lack of awareness and education	3	1	4	– Invest in training programs to enhance the skills and knowledge of local veterinarians and animal health workers

8.4 Communication and Public Awareness

268. The components (Steering Board and Technical Group) will formalize the partnership process for the whole strategy, though appropriate communication arrangements will also take place in the development of individual policies. There will also be regular annual communications on the strategy's progress and priorities. This will include:

• Animal health and welfare conference at which progress on the strategy will be reported and the priorities and delivery of the strategy reviewed.

• Annual publication of Implementation Plans setting out detailed objectives of the strategy and providing a high level report on progress against milestones of the component strategy policies.

269. Wider communication of policies and initiatives within the strategy will take many different forms; from the use of instant information technology to face-to-face explanation, depending on the message that is being delivered and the target audience. The communication of animal health and welfare must

draw in anyone who can help get the message across including vets, interest groups and delivery agents.

8.5 Resource Mobilization Strategy

270. To implement the YAHSIP, the following resource mobilization strategies and approaches will be utilized:

(a) Continuing resource mobilization from national resources;

(b) Continuing resource mobilization from bilateral and multilateral development partners including non-traditional development partners;

(c) Strengthening public-private sector partnerships for resource mobilization.

271. In addition, each thematic area shall innovatively develop specific local resource mobilization, marketing and fundraising strategies. The veterinary services should show the benefits of improved animal health to the national economy as they seek the incorporation of animal health strategies and emergency preparedness in national planning for allocation of financial resources.

8.6 Implementation Plan (YAHSIP) 2024-2034

272. The government has a critical role to play in implementing the YAHSIP. It will be responsible for developing policies and guidelines that support the implementation of the YAHSIP. This includes coordinating with relevant stakeholders to ensure that the strategy is aligned with national priorities and needs. It will be responsible for allocating the necessary resources, including funding, personnel, and equipment, to support the implementation of the YAHSIP.

273. The non-state actors and other stakeholders' organizations involved in the implementation at different levels will organize and mobilize actors, ensure the feedback of information from the primary beneficiaries to implementing agencies, conduct advocacy and awareness campaigns, build capacities of their members, deliver services and foster the integration of actors along the livestock value chains.

274. International organizations including FAO, WOAH, ICRC, GIZ among others will provide technical support, technical backstopping and capacity building in line with their respective mandates and comparative advantages.

275. The implementation of the YAHSIP will be a collaborative effort between the government and its partners and stakeholders. Collaboration and partnership between the government and its partners will be critical to the success of the strategy.

9. CONCLUSION

276. Yemen heavily relies on its livestock sector for food security and livelihoods. Livestock plays a crucial role in providing meat, milk, and other essential products to the population. It also serves as a source of income for many rural communities that depend on selling livestock or its by-products. the animal health situation in Yemen is currently challenging. The ongoing conflict has disrupted veterinary

services, leading to a lack of access to vaccines, medicines, and proper animal healthcare facilities. This has resulted in increased disease outbreaks among livestock, causing significant economic losses for farmers and exacerbating food insecurity.

277. Implementing the YAHSIP would address these challenges by focusing on disease prevention and control measures. Vaccination campaigns can be organized in an organized way to protect livestock from common diseases such as foot-and-mouth disease, brucellosis, and peste des petits ruminants (PPR). Regular monitoring and surveillance systems can be established to detect outbreaks; Early detection of outbreaks would allow for prompt response and containment measures to be implemented, minimizing the spread of diseases and reducing the economic impact on farmers and the agricultural industry.

278. The YAHSIP includes educational programs to raise awareness among farmers about the importance of good hygiene practices and biosecurity measures. By promoting proper sanitation and implementing strict biosecurity protocols, the risk of disease transmission can be significantly reduced. The strategy also involves research and development initiatives to improve diagnostic tools and vaccines, ensuring that livestock are protected against emerging and evolving diseases. Overall, implementing the YAHSIP will not only safeguard the health and well-being of animals but also contribute to the sustainability and productivity of the agricultural sector, to increase incomes, reduce poverty, improve household food and nutrition security, create employment, and stimulate overall economic growth.

279. The strategy will create synergy through the mainstreaming of investments, policy and institutional reforms, enhanced production, productivity, and competitiveness for enhanced contribution to socio-economic development. It focuses on key issues and supports long-term investments in capacity development and the institutional and policy environment. These measures aim to bring about sustainable socio-economic development while supporting resilience, avoiding environmental degradation, and limiting adverse animal health impacts.

280. The expanding global demand for livestock products presents an opportunity to increase production and confronts Yemen with the challenge of supporting a competitive industry that focuses primarily on the well-being and prosperity of the growing urban population in general and smallholder rural communities in particular. The YAHSIP ought to be pragmatic, and transparent and should lead to the development of effective policies, fair and long-lasting legislation. The YAHSIP promotes incentive-driven livelihoods that also cater to the youth and especially women. The YAHSIP promotes partnerships involving all actors through a common agenda.

281. An important aspect of the YAHSIP is capacity development at all levels; at the herding and smallholders' community levels for technology adoption, skills promotion, and conflict-free smart marketing and trade; at the service providers' level (public or private) through vocational training, higher education and smart business promotion. The staff in both training and research institutions will need continuous professional development courses to keep pace with technological changes.

282. Although the formulation of any Strategy is a fundamental prerequisite, it needs to be accompanied by action plans that will articulate detailed projects and programs to achieve the intended outcomes.

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ANNEXE

IMPLEMENTATION PLAN

1. Introduction

283. The Implementation Plan of the Animal Health Strategy for Yemen was developed to effectively translate the main policy goals into actionable and measurable steps. This comprehensive plan aims to address key issues in animal health, such as disease prevention and control, biosecurity measures, and welfare standards across various sectors of the industry. By prioritizing collaboration between government bodies, industry stakeholders, and veterinary professionals, the Implementation Plan aims to ensure a coordinated approach towards achieving national animal health objectives. It outlines specific strategies for education and training programs, research initiatives, data collection systems, and surveillance mechanisms that will contribute to enhancing disease preparedness and management. By aligning with international standards and best practices, this implementation plan seeks to elevate Yemen's reputation in animal health management while mitigating risks to public health and livestock industries.

284. The plan highlights the connections between strategic objectives, programmes, and activities. By outlining this linkage, the Plan ensures that there is alignment and synchronization throughout the entire process. This enables effective planning, monitoring, and evaluation while ensuring that all efforts remain focused on achieving strategic outcomes. It includes annual targets, key players, and estimated costs over a period of ten years. It also estimates costs for a ten-year period (2024 to 2034) allowing for effective budgetary planning, ensuring that adequate resources are allocated to each stage. It establishes financial transparency, enabling stakeholders to understand the investment needed throughout the journey and facilitating more accurate decision-making.

2. Investment Overview

285. The primary objective of a 10-year animal health investment plan is to promote a holistic approach towards safeguarding animal health, ensuring sustainable livestock production, and protecting public health. This plan requires the collaboration of relevant stakeholders, including government agencies, veterinary professionals, researchers, and the private sector.

286. In this paragraph, the optimal distribution of the budget across various components of the comprehensive strategy and the establishment of a timeline for the implementation of each activity was done. Through rigorous analysis, the most effective allocation to achieve the desired outcomes was determined.

Strategic Pillar 1: Improve the capacity of national veterinary institutes to deliver efficient animal health services

Programme 1.1: Establishment/rehabilitation of Veterinary Diagnostic Laboratories

287. Before embarking on any strategic initiatives, it is essential to conduct a comprehensive assessment of the existing veterinary diagnostic laboratories and animal health infrastructures. This

assessment provides valuable insights into the strengths, weaknesses, and gaps in the current system. Approximately USD 1 million was allocated to this assessment, ensuring a thorough evaluation of the current situation.

288. This assessment will involve evaluating the existing facilities, equipment, and resources, as well as identifying gaps and areas for improvement. This activity is proposed to start in Year one and continue into Year two to ensure a thorough understanding of the current state.

289. Based on the findings from the assessment, an extensive long-term strategic plan needs to be developed to address the shortcomings and reconstruct the veterinary diagnostic laboratories and animal health infrastructures. This plan should encompass infrastructure development, capacity building, and quality assurance measures. Allocating USD 3 million towards the development of this plan allows for careful consideration of every aspect and ensures a well-rounded and effective approach. The plan should outline specific goals, objectives, and strategies to address the identified gaps and improve the overall capacity and effectiveness of these facilities. The development of this plan is proposed to begin in Year two and be completed by Year three.

290. Implementing the long-term strategic plan would require tendering of construction or rehabilitation works for building and maintaining premises. To ensure quality facilities, USD 4 million is proposed to be allocated to this item, considering the cost of construction materials, labor, and ongoing maintenance requirements. This process involves soliciting bids from qualified contractors and selecting the most suitable one to carry out the necessary construction or rehabilitation works. The tendering process should start in Year 3 and be completed by Year four to ensure timely implementation of the plan.

291. Enhancing the knowledge and skills of veterinary professionals and animal health workers is crucial for the success of any comprehensive strategy. Allocating USD 2 million for training programs allows for the development and implementation of specialized courses, workshops, and continuing education opportunities to ensure continuous professional development. These programs should cover various aspects of veterinary diagnostics, including laboratory procedures, disease diagnosis, and data interpretation. The training programs should start in Year four and continue until Year nine to ensure comprehensive skill development and knowledge enhancement.

292. An outreach program is essential to raise awareness among the general public about the importance of veterinary diagnostics and its impact on animal health. Allocating USD 1 million towards developing an effective outreach program will help educate livestock owners, breeders, and other stakeholders about the significance of early detection and prevention of diseases. This program should target livestock owners, breeders, and other stakeholders and educate them about the benefits of utilizing accredited facilities and adhering to quality standards. The development and implementation of this program should start in Year five and continue until Year seven to effectively reach the target audience and implement necessary behavioral changes.

293. The consistent delivery of high-quality laboratory procedures, comprehensive standards and guidelines should be established to ensure standardized practices and accurate results. Allocating USD 1 million towards this item will allow for the formation of a dedicated team of experts who can develop and implement these vital protocols. These standards should cover various aspects of laboratory

operations, including sample collection, analysis, reporting, and quality control. The development of these standards and guidelines is proposed to start in Year six and be completed by Year eight to provide clear and standardized protocols for laboratory procedures.

294. To ensure the quality of services provided, an accreditation system for veterinary practitioners and animal health facilities must be established. Allocating USD 1 million towards this system allows for the development of accreditation criteria, assessment procedures, and the establishment of an oversight body to monitor compliance. This system should assess the competency, knowledge, and adherence to standards of practitioners and facilities, and provide accreditation based on predefined criteria. The development and implementation of this system should start in Year seven and continue until Year eight to establish a robust accreditation process.

295. Conducting regular monitoring and evaluation of animal health services is crucial to assess compliance with standards and identify areas for improvement. Allocating USD 500,000 towards this item will ensure that a dedicated team can be established to conduct rigorous assessments and provide valuable feedback for continuous improvement. This activity involves assessing the performance of veterinary diagnostic laboratories, practitioners, and facilities against established standards and guidelines. Regular monitoring and evaluation should start in Year eight and continue until Year ten to ensure ongoing quality assurance and improvement.

296. Fostering collaboration among government agencies, veterinary associations, academia, and international organizations is essential for the success of the overall strategy. Allocating USD 1 million towards collaborative efforts will allow for the establishment of partnerships, joint research projects, and information sharing platforms to drive progress in the field. Throughout the ten-year strategy, collaboration among relevant stakeholders, including government agencies, veterinary associations, academia, and international organizations, should be fostered. This collaboration should involve sharing knowledge, resources, and expertise, as well as coordinating efforts to address common challenges and achieve shared goals. Collaboration should be ongoing throughout the entire duration of the strategy.

297. To ensure the success of the strategy, it is crucial to raise awareness among livestock owners, breeders, and other stakeholders about the importance of adhering to quality standards and seeking services from accredited facilities. To encourage livestock owners and breeders to seek services from accredited facilities and adhere to quality standards, an awareness campaign is necessary. Allocating USD 500,000 towards this initiative enables the development and implementation of targeted campaigns, including workshops, seminars, and educational materials. This awareness-raising campaign should start in Year five and continue until Year ten to effectively reach the target audience and promote behavioral changes.

298. Scientific advancements and changing needs necessitate continuous review and updating of standards and guidelines. Allocating USD 500,000 towards this item ensures that an expert panel can be formed to monitor developments in the field and make necessary revisions to the existing protocols. Established standards and guidelines for laboratory procedures should be continuously reviewed and updated. This activity should be ongoing throughout the entire duration of the strategy to ensure that the standards remain relevant and effective.

Programme 1.2: Access to Quality Veterinary Care

299. To effectively tackle the dynamic challenges in animal and veterinary public health, a significant portion of the budget should be allocated towards research initiatives. Research enables the development of innovative solutions and enhances our understanding of emerging diseases. Allocating USD 4 million towards research initiatives would support studies in animal health, epidemiology, and disease surveillance, enabling the development of evidence-based strategies and interventions. The start of this ten-year strategy would be in Year one, with the creation of a task force comprising experts in the field. This task force would conduct a thorough analysis of current challenges and priorities, taking into account emerging diseases, zoonotic threats, and changing global health landscapes. The task force's report, including actionable recommendations, would be completed within two years (Year two).

300. To ensure that future veterinarians are equipped with the necessary knowledge and skills, it is crucial to update veterinary curricula. Allocating USD 2 million towards curriculum updates and faculty development would facilitate the alignment with international standards, covering essential topics in animal health. This investment will enhance the quality of education provided by veterinary schools and colleges, ultimately improving the preparedness of future professionals. This activity would begin in Year three, with a comprehensive review of existing curricula and their alignment with international standards. Once identified, the necessary revisions and additions would be made, focusing on essential topics in animal health, emerging diseases, and One Health principles. The implementation of the updated curricula would then occur gradually over the next three years, with completion targeted for Year six.

301. To meet the growing demand for qualified veterinarians and veterinary professionals, it is essential to establish new veterinary schools and enhance existing ones. Allocating USD 3 million towards this item would enable the establishment of new institutions and the expansion of existing ones, particularly in underserved areas. By doing so, access to quality veterinary education would increase, ensuring a larger pool of competent professionals in animal and veterinary public health. This activity would commence in Year one, with an assessment of regions or countries lacking veterinary educational institutions or experiencing a shortage of veterinary professionals. Based on this assessment, new veterinary schools and colleges would be established, or existing institutions would be enhanced through infrastructure development, faculty recruitment, and curriculum support. The establishment or enhancement process is expected to take approximately five years, concluding in Year six.

302. To encourage talented individuals to pursue a career in animal and veterinary public health, allocating USD 1 million towards scholarships and study abroad programs is crucial. This investment would provide financial support to deserving students, allowing them to acquire international exposure and specialized training. Scholarships and study abroad programs not only promote diversity but also enhance the capabilities of future professionals in addressing global challenges. In Year four, scholarship programs could be launched, offering financial support to selected students or professionals for international study opportunities. Study abroad programs would then be implemented in Year five, providing practical experiences in different countries. These programs would continue throughout the ten-year strategy, ensuring a continuous flow of knowledge and skills.

303. Given the global nature of animal and veterinary public health, fostering partnerships and collaborations with international organizations is paramount. Allocating USD 2 million towards building and sustaining partnerships would facilitate knowledge exchange, resource sharing, and collaborative efforts in addressing common challenges. These partnerships would not only enhance the effectiveness of interventions but also promote global cooperation and solidarity in animal health. In Year two, efforts would be initiated to establish formal collaborations with organizations like the World Organisation for Animal Health (WOAH), the Food and Agriculture Organization (FAO), and the World Health Organization (WHO). These partnerships would involve joint research projects, knowledge sharing, and capacity building initiatives. The collaboration would continue throughout the ten-year strategy, fostering a robust global network in animal and veterinary public health.

304. Allocating USD 1 million towards supporting research initiatives in animal health, epidemiology, and disease surveillance will allow advancing our understanding of animal diseases, epidemiology, and disease surveillance. In Year one, funding mechanisms and research grant opportunities could be established, encouraging researchers to focus on priority areas identified by the task force. Over the course of the ten-year strategy, research projects could be conducted in collaboration with national and international institutions. The culmination of this research would lead to significant advancements in animal and veterinary public health.

305. It is crucial to ensure that veterinary services are accessible to all, including rural communities. Allocating USD 1 million towards expanding veterinary services in rural areas could enable the establishment of veterinary clinics and mobile units. These initiatives would enhance disease surveillance, preventive care, and treatment services for livestock, ultimately improving the health and productivity of animals in underserved regions. In Year four, initiatives would be undertaken to establish veterinary clinics or mobile units in underserved rural regions. These initiatives would involve collaboration with local governments, NGOs, and veterinary professionals. Over the next five years, the expansion of veterinary services would continue, ensuring that rural communities have access to essential veterinary care.

306. To foster a culture of animal health and welfare, allocating USD 1 million towards awareness and education initiatives is vital. This investment would support public awareness campaigns, educational programs, and outreach activities. By increasing awareness about zoonotic diseases, responsible pet ownership, and animal welfare, these initiatives would contribute to the overall well-being of both animals and humans. These activities would begin in Year one, targeting various stakeholders such as farmers, pet owners, and the general public. Collaborations with media outlets, community organizations, and educational institutions would facilitate the dissemination of information. The awareness and education initiatives would be sustained throughout the ten-year strategy, with periodic evaluations and adaptations to ensure effectiveness.

Programme 1.3: Development of Mobile Veterinary Units

307. Conducting a comprehensive assessment will allow for the identification of key areas that require attention and resources for developing the mobile unit. Allocating a substantial portion of the budget, approximately USD 2 million, to this assessment will enable the strategy to have a solid foundation and ensure that subsequent actions are tailored to the specific needs of the target population. The

comprehensive assessment should commence in the first year and continue into the second year. This assessment should involve gathering data on the prevailing animal health issues, local veterinary infrastructure, and community needs. By the end of the second year, a thorough understanding of the challenges will be established, providing a solid foundation for the subsequent activities.

308. Once the assessment is complete, it is important to develop a detailed plan that outlines the goals, objectives, and strategies of the mobile unit activity. This plan serves as a roadmap for implementation and provides a clear direction for all stakeholders involved. Allocating USD 1 million to the development of this plan will allow for thorough research, consultation, and the inclusion of expert opinions to ensure its effectiveness. This planning phase should commence in the second year and continue into the third year. The plan should outline specific objectives, strategies, and action steps, considering the resources, expertise, and timeline required. By the end of the third year, a comprehensive plan should be finalized, ready for implementation.

309. Securing appropriate vehicles and equipment necessary for the project is another essential component. This includes vehicles for transportation of animals and equipment for veterinary care and emergency response. Allocating USD 1.5 million to this item will enable the project to have the necessary resources to provide immediate and efficient support to animals in need in each of the governorates. This activity should start in the third year and continue into the fourth year. It involves identifying the specific requirements based on the plan developed earlier, sourcing suitable vehicles, and procuring essential equipment. By the end of the fourth year, all necessary vehicles and equipment should be in place, ensuring the smooth execution of the strategy.

310. Providing training on animal health management, treatment protocols, emergency response, and basic veterinary care is crucial for the success of the project. Allocating USD 2.5 million to training programs will ensure that individuals involved in the project are equipped with the necessary skills and knowledge to effectively address the needs of the animals. This activity should commence in the fourth year and continue through the sixth year. The training program should cover areas such as animal health management, treatment protocols, emergency response, and basic veterinary care. By the end of the sixth year, all relevant stakeholders should have received comprehensive training, enabling them to carry out their roles effectively.

311. Developing a sustainable funding mechanism to support the operation and maintenance of the project is essential for its long-term success. Allocating USD 1.5 million to this item will allow for the establishment of a reliable and consistent source of funding, ensuring the continuity of the project beyond the initial budget allocation. This activity should start in the fifth year and continue into the sixth year. It involves exploring various funding options, such as government grants, private donations, and partnerships with philanthropic organizations. By the end of the sixth year, a sustainable funding mechanism should be in place, providing the necessary financial resources for ongoing operation and maintenance.

312. Establishing collaborations and partnerships with relevant organizations and stakeholders is crucial for the success and impact of the project. Allocating USD 1 million to this item will enable the project to leverage resources, expertise, and networks to maximize its reach and effectiveness. This activity should commence in the sixth year and continue through the eighth year. It involves identifying potential collaborators, such as local veterinary clinics, research institutions, and non-profit

organizations. By the end of the eighth year, strong collaborations and partnerships should be established, allowing for shared expertise, resources, and support.

313. Developing an outreach program to raise awareness about the project and its objectives is essential to garner support and engagement from the community. Allocating USD 500,000 to this item will enable the project to implement effective communication strategies, such as social media campaigns, community events, and educational programs. This activity should start in the seventh year and continue into the ninth year. It involves developing an outreach program that educates the community about animal health management practices, disease prevention, and the importance of veterinary care. By the end of the ninth year, an effective outreach program should be implemented, fostering a culture of responsible animal ownership and care.

314. Implementing a monitoring and evaluation system to assess the effectiveness and impact of the project is crucial for continuous improvement and accountability. Allocating USD 500,000 to this item will ensure that the project can measure its success, identify areas for improvement, and make informed decisions based on data and evidence. This activity should commence in the ninth year and continue into the tenth year. It involves collecting and analyzing data on key performance indicators, such as disease prevalence, treatment outcomes, and community satisfaction. By the end of the tenth year, a comprehensive evaluation report should be generated, providing insights for future improvements and ensuring the long-term success of the animal health management strategy.

Programme 1.4: Veterinary Personnel Training and Development

315. Training programs play a vital role in enhancing the competencies of veterinary professionals. These programs should focus on the latest advancements in veterinary medicine, diagnosis, and treatment methodologies. Allocating a significant portion of the budget towards organizing comprehensive training programs will ensure that professionals stay updated with evolving practices. To achieve this, approximately $1 million is allocated to conduct regular training programs, including workshops and practical sessions. The ten-year strategy will commence by conducting training programs in the first year and conclude by the fifth year.

316. In addition to training programs, regular seminars targeting veterinarians, para-veterinarians, and other relevant stakeholders, such as Community Animal Health Workers (CAHWs) will provide a platform for knowledge exchange and networking. Allocating $500,000 towards organizing annual seminars will enable professionals to stay connected with the latest research findings and industry trends, enhancing their overall expertise. The ten-year strategy will organize regular training seminars, starting from the second year and continuing throughout the entire duration.

317. To support practical training, research, and diagnostic capabilities, enabling veterinary professionals to provide accurate diagnoses, conduct research, and train future veterinarians effectively investing in facilities, laboratories, and equipment is crucial. Allocating $750,000 towards upgrading and equipping veterinary institutions with state-of-the-art facilities will ensure hands-on training and advanced research opportunities. This investment will also attract talented students and faculty members, further enhancing the quality of education. The strategy will allocate resources to invest in facilities, laboratories, and equipment, beginning from the third year and ending by the seventh year.

318. Organizing conferences, webinars, and online training platforms is essential for promoting continuous professional development. Allocating $500,000 towards these initiatives will create opportunities for veterinary professionals to engage with experts from around the world, fostering a culture of lifelong learning. Starting from the third year, the strategy will promote continuous professional development by organizing conferences, webinars, and online training platforms.

319. A well-trained and motivated faculty is essential for delivering high-quality education. Allocating $300,000 towards training and professional development opportunities for faculty members and staff will ensure they remain up-to-date with the latest pedagogical techniques and advancements in their respective fields. The strategy will allocate resources to facilitate this from the third year onwards, ensuring that educators and staff members stay updated with the latest educational methodologies, research techniques, and advancements in the field.

320. Ensuring that educational institutions meet and maintain required standards is critical for the credibility of academic programs. Allocating $200,000 towards implementing robust quality assurance and accreditation mechanisms will help maintain high educational standards, faculty qualifications, and student outcomes. Starting from the fourth year, the strategy will establish these mechanisms to evaluate educational institutions, ensuring that they meet and maintain the required standards for academic programs, faculty qualifications, and student outcomes.

321. Awareness campaigns highlighting the importance of animal health on public health, food security, and the economy are essential. Allocating $300,000 towards conducting nationwide campaigns will help educate the public and policymakers about the significance of animal health, fostering support for the sector. To create a broader understanding of the importance of animal health, the strategy will conduct awareness campaigns starting from the fourth year.

322. To address important animal health challenges, allocating $500,000 towards research activities will foster innovation and contribute to the development of new treatment methodologies, diagnostics, and vaccines. This investment will encourage collaboration between educational institutions and industry partners, leading to groundbreaking discoveries. The strategy will encourage and support research activities starting from the fifth year.

323. Allocating $150,000 towards regularly assessing the effectiveness of educational programs, teaching methods, and learning outcomes will ensure continuous improvement in the quality of education. These assessments can help identify areas that require attention and guide future investments. Starting from the sixth year, the strategy will evaluate the effectiveness of educational programs to identify areas for improvement and implement necessary changes. This will ensure that veterinary professionals receive the best education and training possible, equipped with the knowledge and skills required to tackle animal health challenges effectively.

324. Advocacy is crucial for the growth and development of educational institutions in the animal health sector. Allocating $100,000 towards advocacy efforts will enable the sector to influence policies and regulations that prioritize its development, fostering a conducive environment for educational institutions. Starting from the seventh year, the strategy will actively engage with policymakers and relevant stakeholders to prioritize the needs of educational institutions.

325. Collaborations with international educational institutions, research organizations, and donor agencies can enhance knowledge sharing and resource mobilization. Allocating $200,000 towards fostering collaborations and partnerships will open doors for joint research projects, student exchange programs, and access to additional funding opportunities. From the eighth year onwards, the strategy will focus on fostering collaborations and partnerships with international educational institutions, research organizations, and donor agencies.

326. To attract and support talented students, allocating $200,000 towards scholarships, grants, or financial aid programs will ensure that deserving candidates can pursue education in the animal health field. This investment will contribute to building a skilled workforce and nurturing future leaders. To attract and support talented students, the strategy will establish scholarships, grants, or financial aid programs from the eighth year.

327. Allocating $300,000 towards updating curricula to align with international standards and cover essential topics in animal health will ensure that graduates are well-prepared to tackle emerging challenges. This investment will help bridge the gap between academia and industry needs. To ensure that curricula remain relevant and in line with international standards, the strategy will update them starting from the ninth year. This update will incorporate essential topics in animal health, such as One Health, animal welfare, and biosecurity.

328. Before embarking on any standardization process, it is imperative to assess the current policies and regulations in place. This stage allows for the identification of gaps and areas of improvement. Allocating USD 250,000 towards this endeavor would enable comprehensive research, consultation with experts, and the development of evidence-based recommendations. This activity should ideally commence in the first year of the strategy and be completed within a year to provide a solid foundation for subsequent actions.

329. To foster collaboration and ensure that the standardization process incorporates diverse perspectives, engaging relevant stakeholders is crucial. Allocating USD 300,000 towards this item would facilitate meetings, workshops, and conferences with key stakeholders, including veterinary professionals, animal health technicians, animal owners, farmers, and representatives from regulatory bodies and animal welfare organizations. This activity should begin in the second year and continue throughout the ten-year strategy.

330. Developing a robust framework for certification and licensing standards is essential to ensure the competence and professionalism of individuals involved in animal health. Allocating USD 400,000 towards this component would enable the hiring of experts, conducting research on best practices, and the formulation of comprehensive guidelines. The third year of the strategy should focus on establishing a framework for certification and licensing standards. This activity entails researching international best practices, consulting with experts, and developing guidelines that encompass the knowledge, skills, and expertise required for individuals involved in animal health.

331. Enhancing the knowledge, skills, and expertise of individuals involved in animal health is vital for effective animal care. Allocating USD 600,000 towards the design and implementation of training programs would allow for the development of specialized courses, training materials, and the engagement of experienced trainers. In the fourth and fifth years, training programs should be

designed and implemented to enhance the knowledge, skills, and expertise of individuals involved in animal health. These programs should be tailored to the specific needs of different roles, such as veterinary professionals, animal health technicians, and related personnel. Collaboration with educational institutions and professional organizations is crucial to ensure the programs are comprehensive, evidence-based, and meet the evolving demands of the field.

332. To ensure the quality and credibility of training programs and individuals seeking certification or licenses, an accreditation or certification body must be established. Allocating USD 400,000 towards this item would cover the costs associated with the establishment, staffing, and operational expenses of the body. In the fourth and fifth years, the accreditation or certification body should be established. This body will be responsible for evaluating and approving training programs, institutions, and individuals seeking certification or licenses in animal health. It is essential to ensure the body is independent, transparent, and has the necessary expertise to uphold the standards set forth in the framework.

333. To streamline the licensing process for veterinary professionals, animal health technicians, and related personnel, a comprehensive licensing system must be developed. Allocating USD 350,000 towards this component would allow for the development of an efficient application process, evaluation criteria, and renewal requirements for veterinary professionals, animal health technicians, and related personnel. In the sixth and seventh years, a comprehensive licensing system should be developed.

334. To enforce certification and licensing standards effectively, mechanisms such as inspections, audits, and penalties must be put in place. Allocating USD 300,000 towards this item would cover the costs associated with monitoring compliance, conducting inspections, and maintaining an effective enforcement system. Starting in the eighth year, mechanisms to enforce certification and licensing standards should be implemented.

335. To assess the effectiveness and impact of the standardization efforts, a robust monitoring and evaluation framework is essential. Allocating USD 200,000 towards this component would enable the establishment of data collection systems, hiring of evaluators, and conducting comprehensive impact assessments. In the ninth year, a monitoring and evaluation framework should be established to assess the effectiveness and impact of the standardization efforts. This framework will provide valuable insights into the progress made, identify areas for improvement, and inform future decision-making. Regular evaluations should be conducted to gauge the success of the strategy and make necessary adjustments.

336. To educate animal owners, farmers, and the general public about the importance of certified and licensed professionals in ensuring animal health and welfare, public awareness campaigns must be conducted. Allocating USD 400,000 towards this item would cover the costs of developing educational materials, advertisements, and organizing awareness events. Throughout the ten-year strategy, public awareness campaigns should be conducted to educate animal owners, farmers, and the general public about the importance of certified and licensed professionals in ensuring animal health and welfare. These campaigns should emphasize the benefits of standardized practices, the risks associated with unqualified individuals, and the role of certification and licensing in maintaining high standards.

Programme 1.5: Enabling legislation on Animal Welfare, Handling, and Transportation, and Traditional Knowledge

337. To ensure the welfare of animals, it is crucial to conduct regular inspections and field investigations. Allocating a budget of USD 500,000 will enable the establishment of a dedicated team responsible for conducting inspections and addressing welfare concerns. It includes expenses such as staff salaries, transportation, equipment, and communication tools. A significant portion will be allocated to reporting mechanisms and public awareness campaigns to encourage individuals to report animal welfare concerns. To lay the foundation for the ten-year strategy, it is essential to commence the process of conducting inspections, field investigations, and reporting animal welfare concerns from the very beginning. This activity should begin in year one and continue throughout the entire ten-year period. By actively monitoring and addressing animal welfare concerns, we can identify areas of improvement and initiate appropriate interventions promptly.

338. Research and innovation play a vital role in advancing animal welfare practices. Allocating a budget of USD 1,500,000 will support funding for research projects focused on animal welfare, including studies on enhancing animal care, treatment, and transportation and understanding the roles of private and public assessment and the long-term consequences of implementing different animal welfare strategies. It will facilitate the development of educational programs and material to raise awareness and educate the public, professionals, and stakeholders about animal welfare. Funds will be utilized for hiring experts, conducting research, for research grants, scholarships, educational materials, workshops, and conferences and seminars to discuss and disseminate findings. The development of policies addressing funding for animal welfare research and innovation, as well as education, should commence in year one and extend until year three. These policies will serve as a catalyst for advancing our knowledge and understanding of animal welfare, ensuring the implementation of evidence-based practices and promoting educational initiatives among various stakeholders.

339. Developing protocols, guidelines, procedures, and codes of conduct is essential to ensure consistent and humane treatment of animals. This budget allocation of USD 1 million will support the development of comprehensive protocols for animal use, ethical guidelines on handling, care, treatment, and transportation, standard operating procedures (SOPs), and codes of conduct. Funds will be utilized for expert consultations, drafting, printing, and distribution of these documents. This developmental process should commence in year two and be completed by year four. These frameworks will provide clear guidelines on the humane handling, care, treatment, and transportation of animals, thereby promoting their overall well-being.

340. Ensuring the competency of research staff in animal welfare practices is crucial for successful implementation. This budget allocation of USD 500,000 will provide comprehensive training programs for research staff in biosafety, compliance, and regulatory programs. Funds will cover training materials, trainers' fees, and logistics required for organizing workshops and seminars. This training initiative should start in year three and continue until year seven. By equipping research staff with the necessary knowledge and skills, we can ensure the effective implementation of animal welfare practices and compliance with regulatory standards.

341. In parallel with the research staff training, it is crucial to provide training for veterinary and other professional staff, including veterinarians and animal care personnel. To enhance animal welfare practices, it is imperative to train veterinary and other professional staff on animal welfare, handling, transportation, and traditional knowledge. This budget allocation of USD 500,000 will support training programs and workshops to improve professionals' skills and knowledge. It includes expenses such as trainers' fees, transportation, accommodation, and training materials. This training should commence in year four and be completed by year six. By educating these professionals on animal welfare, handling, transportation, and traditional knowledge, we can improve the quality of care provided to animals across various sectors.

342. To ensure the enforcement of animal welfare standards, it is imperative to develop and implement robust regulatory frameworks for animal health and welfare. Establishing robust regulatory frameworks is crucial to ensure the enforcement of animal welfare practices. This budget allocation of USD 500,000 will support the development and implementation of comprehensive regulatory frameworks for animal health and welfare. Funds will be utilized for legal consultations, drafting regulations, and raising awareness among stakeholders. This process should begin in year five and continue until year eight. These frameworks will establish clear guidelines, regulations, and protocols to safeguard animal welfare and hold accountable those who violate these standards.

343. To oversee and ensure the ethical treatment of animals in research, an Institutional Animal Care and Use Committee (IACUC) should be established. This committee should be created in year six and continue its operations indefinitely. By having an IACUC in place, we can guarantee that research involving animals adheres to ethical guidelines and promotes their well-being.

344. To strengthen legislation and enforcement, it is essential to engage in networking, collaboration, and community meetings. This budget allocation of USD 500,000 will support networking, collaboration, community meetings, workshops, and stakeholder meetings to enhance awareness, understanding, and compliance with animal welfare legislation. Funds will be utilized for organizing these events, logistics, and communication tools. These initiatives should commence in year seven and continue until year nine. By fostering partnerships with government entities, local institutions, and stakeholders, we can collectively work towards enhancing animal welfare legislation and enforcement.

345. Traditional farm animal species represent a significant portion of animal welfare concerns. As part of our comprehensive strategy, we must address the welfare of traditional farm animal species, which are kept for the production of meat, milk, and eggs. This budget allocation of USD 500,000 will address the welfare of these animals by conducting research, implementing educational programs, and providing support to farmers. Funds will be allocated to research grants, educational materials, training programs, and incentives for farmers adopting improved welfare practices. This activity should commence in year eight and continue until year ten. Additionally, it is crucial to assess the drivers and barriers when integrating traditional knowledge into animal welfare practices, considering other ethical issues. This research endeavor should be conducted in conjunction with workshops, webinars, infographics, rewards and recognition, and local capacity building initiatives.

346. Integrating traditional knowledge into animal welfare practices is essential for cultural relevance and sustainability. This budget allocation of USD 500,000will support research projects and workshops

aimed at assessing the drivers and barriers to integrating traditional knowledge into animal welfare practices. Funds will cover research expenses, expert consultations, and organizing workshops. These initiatives should commence in year eight and continue until year ten.

Strategic Pillar 2: Improve disease prevention and control strategies for safe animal health delivery

Programme 2.1: Development of a National Strategy to Control and Eradicate Peste des Petits Ruminants (PPR)

347. Establishing a Technical Committee of Experts on PPR is crucial to ensure a coordinated and evidence-based approach to disease control. This committee would consist of highly skilled professionals from relevant fields such as veterinary medicine, epidemiology, and virology. Their main objective will be to assess the current situation, identify knowledge gaps, and propose evidence-based control measures. Allocating $500,000 for this purpose would enable the committee to conduct research, develop guidelines, and provide technical support throughout the eradication program. These initiatives should commence in year one.

348. Standard Operating Procedures (SOPs) are essential for ensuring consistent and effective laboratory procedures, training, quarantine, surveillance, and other activities involved in PPR control. By allocating $800,000 towards this objective, the strategy can facilitate the development, updating, and harmonization of SOPs. This investment will enable the smooth functioning of various operations and enhance the overall effectiveness of the program. These initiatives should commence in year one and continue until year three. This process will take approximately three years to ensure the SOPs are comprehensive, harmonized, and aligned with international standards. The development and updating of SOPs for laboratory procedures, training, quarantine, surveillance, and other related activities will require extensive research and consultation with international experts.

349. Developing legal instruments and legislation specific to the control and eradication of PPR is crucial for effective enforcement and compliance. Allocating $700,000 towards this component will enable the drafting and implementation of comprehensive laws that address the unique challenges of PPR control. This investment will also strengthen the enforcement of relevant sections of existing animal diseases control legislation, ensuring accountability and adherence to regulations. These initiatives should commence in year two and continue until year four. Developing legal instruments and legislation for the control and eradication of PPR is essential to provide a legal framework for implementing control measures. This process will involve collaborating with legal experts, policymakers, and stakeholders. Strengthening the enforcement of relevant sections of existing animal diseases control legislation will require amendments and rigorous enforcement to ensure compliance.

350. Effective communication and engagement with stakeholders are vital for the success of any eradication program. Allocating $500,000 towards stakeholders' awareness and engagement initiatives will enable the development and implementation of targeted campaigns to educate various segments of society about existing regulations and laws related to PPR control. This investment will foster collaboration and support from farmers, veterinarians, and other key stakeholders. These

initiatives should commence in year two and continue until year five. This process will require continuous efforts for approximately four years to ensure widespread understanding and compliance.This activity will involve conducting awareness campaigns, workshops, and training programs for various segments of society, including farmers, veterinary professionals, policymakers, researchers, and the general public.

351. Mass vaccination is a proven strategy for controlling and eradicating PPR. Allocating $2,000,000 towards a 3-year mass vaccination program targeting 80% of the national sheep and goat herd will ensure widespread coverage and protection against the disease. This investment will cover the costs of vaccines, vaccination teams, training, and monitoring activities. These initiatives should commence in year one and continue until year three and would be repeated. The vaccination drive will be carried out systematically, covering all regions and reaching remote areas.

352. To assess the effectiveness of the mass vaccination program, post-vaccination sero-monitoring is essential. Allocating $300,000 for this purpose will enable the collection and analysis of blood samples to determine antibody levels and evaluate the success of the vaccination campaign. This investment will provide valuable data to guide future interventions and ensure the program's continued progress. These initiatives should commence in year four and continue until year seven and would be repeated. Post-vaccination sero-monitoring is crucial to assess the effectiveness of the mass vaccination campaign. This activity involves regularly collecting and analyzing blood samples from vaccinated animals to determine the level of immunity. This monitoring process will provide crucial feedback on the effectiveness of the vaccinations and guide any necessary adjustments to the vaccination strategy.

353. PPR continues to persist in certain high-risk areas, necessitating targeted interventions. Allocating $1,000,000 for a 1-year (post 3-year program) targeted vaccination program in these areas will help control the disease's spread and protect vulnerable populations. This investment will cover the costs of vaccine procurement, transportation, and vaccination teams. These initiatives should commence in year seven for 1 year). Following the completion of the three-year mass vaccination campaign, targeted vaccinations will be conducted in PPR high-risk areas. This one-year program aims to address any remaining pockets of infection and ensure complete eradication of the disease.

354. To prevent the introduction and spread of PPR among young or newly added animals, a mop-up vaccination campaign for the young/new additions for the next 1 year is essential. Allocating $200,000 for this purpose will enable targeted vaccination of susceptible animals, ensuring comprehensive coverage and reducing the risk of disease transmission. These initiatives should commence in year nine for 1 year. Mop-up vaccinations will be carried out for young and newly added animals for one year to ensure the disease does not resurge due to susceptible individuals. This activity will focus on reaching new livestock additions and ensuring their vaccination coverage.

355. Enhancing biosecurity measures and implementing strict animal movement controls are crucial for preventing the introduction and spread of PPR. Allocating $500,000 towards this component will support the implementation of robust biosecurity protocols, training programs, and monitoring systems. This investment will also facilitate the engagement of transporters, marketers, and processors in animal movement control efforts. These initiatives should commence in year one and continue until year ten. Biosecurity measures and animal movement control are ongoing activities that will be implemented throughout the ten-year strategy. This includes enforcing strict biosecurity protocols,

promoting quarantine measures, and monitoring animal movements to prevent the introduction and spread of PPR.

356. Effective surveillance and early detection are critical for timely response interventions and preventing the spread of PPR. Allocating $600,000 towards enhancing disease surveillance capabilities will enable the establishment of a comprehensive monitoring system, including diagnostic testing, data collection, and reporting mechanisms. This investment will facilitate early detection, rapid response, and targeted control measures. Enhance disease surveillance and early detection and response interventions in areas where PPR continues to persist. These initiatives should commence in year one and continue until year ten. Disease surveillance and early detection systems will be strengthened continuously throughout the ten-year strategy. This will involve training veterinary professionals, establishing surveillance networks, implementing rapid diagnostic tests, and enhancing reporting mechanisms. These interventions will enable quick responses to any new outbreaks and ensure the disease does not persist in any region.

357. Involving private veterinarians in vaccination and biosecurity efforts is essential for comprehensive disease control. Allocating $300,000 towards the engagement of private veterinarians will facilitate their participation through training programs, incentives, and collaborative initiatives. This investment will enhance the capacity and reach of the eradication program. These initiatives should commence in year three and continue until year ten. Engaging private veterinarians in vaccination campaigns and biosecurity measures is crucial for reaching a wider population of sheep and goats. This activity will involve training and capacity building programs for private practitioners, creating partnerships, and providing incentives to encourage their active participation.

358. Engaging transporters, marketers, and processors in animal movement control is crucial for preventing disease spread through the livestock trade. Allocating $400,000 towards this component will enable the implementation of awareness campaigns, training programs, and incentives to ensure compliance with biosecurity protocols. This investment will foster responsible practices and support the overall success of the eradication program. These initiatives should commence in year one and continue until year ten. Engaging transporters, marketers, and processors in animal movement control is vital to prevent the spread of PPR. This activity will involve creating awareness among these stakeholders, implementing regulations, and conducting regular monitoring and inspections to ensure compliance.

359. Once the eradication program has been implemented, verifying the eradication of PPR is essential for international recognition and trade benefits. Allocating $300,000 towards verification activities, such as serological surveys and field investigations, will enable the submission of an application for PPR freedom certification from the World Organisation for Animal Health (WOAH). This investment will showcase the program's success and open doors for international trade opportunities. The first step in our ten-year plan is the verification of PPR eradication, which is crucial for obtaining WOAH accreditation of freedom. This process involves rigorous surveillance, monitoring, and testing of livestock populations. It is recommended that this verification process begins in year three of the strategy and continues until year eight, ensuring a comprehensive evaluation of PPR status.

360. Once the verification process is completed, the next step is to apply for PPR freedom certification from the WOAH. This application should be submitted promptly after the verification process

concludes, ideally in year eight. It is essential to provide extensive documentation, including evidence of surveillance, vaccination campaigns, and disease control measures implemented during the eradication process.

361. To ensure a holistic approach to small ruminant health, it is important to address other diseases such as contagious caprine pleuropneumonia, brucellosis, endo- and ecto-parasites, and sheep/goat pox. Allocating $160,000 towards the incorporation of these diseases into the eradication program will enable the development of additional strategies, training programs, and surveillance activities. This investment will result in comprehensive disease control measures and overall improvement in small ruminant health. The timeline for this incorporation should be implemented concurrently with the PPR eradication efforts, starting in year one and continuing throughout the ten-year strategy. This approach ensures comprehensive disease control and prevents the resurgence of PPR due to other co-existing diseases.

362. Adequately equipping and mobilizing veterinary services is a crucial aspect of our strategy. To effectively combat these diseases, it is essential to equip veterinary clinics with necessary supplies, including wormers, antiprotozoans, and pox vaccines. Allocating $300,000 towards procuring these supplies, training veterinary staff, and mobilizing resources will ensure timely and effective treatment for affected animals. The procurement and distribution of wormers, antiprotozoans, and pox vaccines should be prioritized in year one and continually maintained throughout the entire ten-year timeline.

363. To ensure efficient implementation of the strategy, it is essential to establish or strengthen national-level coordination and management structures. This includes the proper networking of the Central Veterinary Laboratory (CVL) with all laboratories spread across the country. A well-coordinated and efficient management structure is critical for the successful execution of any strategy. Allocating $250,000 towards establishing a national coordination and management structure will enable the development of standardized protocols, efficient data collection, and streamlined decision-making processes. The establishment or strengthening of the National PPR Coordinating Committee (NPCC) should also be prioritized in year one. The NPCC will serve as an advisory committee on PPR, providing guidance and expertise in the eradication process.

364. Our strategy emphasizes active participation in cross-border, regional animal health, and production networks' meetings. To enhance the sharing of data and information on animal health, it is imperative to establish a robust network between the Central Veterinary Laboratory (CVL) and other laboratories nationwide. Allocating $150,000 towards infrastructure development, training, and technology upgrades will help create a seamless flow of information, leading to improved disease surveillance and control measures. This involvement facilitates the sharing of data and information, promoting collaboration and exchange of best practices. Engagement in these networks should commence in year one and continue throughout the ten-year plan, ensuring constant knowledge transfer and learning from neighboring countries' experiences.

365. PPR poses a significant threat to animal health, and effective coordination is necessary for its control. Allocating $100,000 towards the establishment and strengthening of the NPCC will ensure a dedicated advisory committee focused on PPR. Their expertise will guide decision-making, enhance collaboration, and facilitate the implementation of effective control strategies.

Establishing/Strengthening the National PPR Coordinating Committee on PPR control activities should be initiated in year one of the strategy and continue throughout the entire timeline.

366. The sharing of data, information, and best practices is crucial to staying updated on emerging animal health issues. Allocating $100,000 towards participating in cross-border and regional animal health networks will foster collaboration, facilitate knowledge exchange, and enhance the overall effectiveness of disease control strategies. Collaboration on PPR control activities should be initiated in year two of the strategy and continue throughout the entire timeline.

367. Coordinated efforts with neighboring countries are vital for effective disease control. Allocating $150,000 towards joint vaccination campaigns and cross-border collaboration activities will enable the establishment of vaccination programs targeting shared animal populations. This approach will help prevent the spread of diseases such as PPR and strengthen regional cooperation. Joint vaccination campaigns and cross-border collaboration on PPR control activities should be initiated in year two of the strategy and continue throughout the entire timeline. This collaboration strengthens disease surveillance, ensures coordinated vaccination efforts, and prevents the reintroduction of PPR through cross-border livestock movements.

368. Investing in capacity building is essential for the long-term sustainability of any animal health strategy. Allocating $200,000 towards sponsorship and funding of capacity building mechanisms will support training programs, research initiatives, and technical assistance. This investment will ensure the availability of skilled personnel, innovative research, and improved infrastructure for sustainable animal health management. This includes training programs for veterinary personnel, farmers, and other stakeholders involved in disease control. The allocation of funds for capacity building should be secured in year one and continuously monitored and adjusted throughout the ten-year plan to meet evolving needs.

Programme 2.2: Implementation of Prevention and Control measures for sheep and goat pox outbreaks

369. The first step in controlling the spread of SPP/GTP is the timely recognition of disease eruption. Investing in diagnostic tools and laboratory facilities is crucial for accurate and rapid diagnosis. Approximately 10% of the budget, or USD 200,000, should be allocated to strengthening diagnostic capabilities by providing training to veterinary staff, procuring testing kits, and establishing a centralized diagnostic facility.

370. The first year of the strategy will focus on raising awareness among farmers and veterinary staff regarding the clinical signs of SPPV and GTPV. Awareness campaigns will be launched to promote recognition of the diseases, enabling early identification and intervention.

371. Early detection and notification play a pivotal role in preventing the further spread of SPP/GTP. Approximately 15% of the budget, or USD 300,000, should be allocated to developing a robust surveillance system. This includes the establishment of a network of trained veterinary professionals, incentivizing timely reporting, and implementing a central reporting system. Additionally, funds should be allocated to support prompt movement restrictions and culling of affected herds based on clinical signs, accounting for approximately 20% of the budget or USD 400,000.

372. Building upon the awareness campaign, the second and third years will emphasize early detection and notification mechanisms. Farmers and veterinary staff will be trained in recognizing clinical signs

and promptly reporting suspected cases. Upon confirmation, affected herds will be culled to prevent further spread. Movement restriction will be implemented to contain the outbreak, and the duration and size of the protection zone will be extended.

373. To prevent the spread of SPP/GTP, it is crucial to restrict animal movement and isolate infected animals. Approximately 20% of the budget, or USD 400,000, should be allocated to implementing strict movement control measures, including the establishment of checkpoints, quarantine facilities, and the deployment of trained personnel to ensure compliance. Moreover, USD 300,000 should be allocated to the isolation of infected animals by moving healthy animals away from them, which includes setting up temporary shelters and providing necessary resources for proper animal care.

374. In the fourth and fifth years, strict measures will be implemented to restrict the movement of animals, preventing the spread of SPPV and GTPV. Infected animals will be isolated by moving healthy animals away from them, minimizing the chances of transmission. In the six, to prevent the introduction of the diseases into unaffected herds, a mandatory quarantine period will be established before introducing new animals. This step will ensure that any potential carriers or infected animals are identified and isolated before being introduced into the herd, reducing the risk of disease transmission.

375. Currently, only live attenuated vaccines are available for SPP/GTP. Allocating USD 400,000, or 20% of the budget, to the procurement and distribution of vaccines is essential. Additionally, funds should be allocated to support research and development efforts to develop more effective and affordable vaccines in the long run. In the seventh and eighth years, extensive research and development will be conducted to enhance vaccine efficacy and safety. This will ensure the availability of more effective vaccines, reducing the impact of future outbreaks.

376. To prevent the transmission of SPP/GTP, strict cleaning and disinfection protocols should be implemented. Approximately 10% of the budget, or USD 200,000, should be allocated to providing necessary equipment, disinfectants, and training to ensure proper cleaning and disinfection practices.

377. Proper cleaning and disinfection protocols will be established in the ninth year to prevent the persistence of the virus in the environment. Equipment that comes into contact with infected animals will be thoroughly disinfected to eliminate any potential sources of infection.

378. The proper disposal of carcasses and products from infected animals is critical to prevent further contamination. USD 100,000, or 5% of the budget, should be allocated to establish proper disposal facilities and protocols. The ninth year will also focus on developing guidelines for the proper disposal of carcasses and products from infected animals. This will minimize the risk of further contamination and ensure the safe handling of potentially infectious materials.

379. To promote recognition of the disease among farmers and veterinary staff, allocating USD 200,000, or 10% of the budget, to awareness-raising campaigns is essential. These campaigns should include training programs, distribution of educational materials, and workshops to enhance disease awareness and promote best practices. Finally, in the tenth year, further awareness-raising campaigns will be conducted to reinforce knowledge about SPPV and GTPV among farmers and veterinary staff. This ongoing education will foster continuous vigilance and help sustain the successful management of future outbreaks.

380. Encouraging prompt reporting of suspicions is vital for early detection and control. Approximately USD 100,000, or 5% of the budget, should be allocated to incentivize reporting by providing rewards, establishing a hotline for reporting, and ensuring confidentiality.

Programme 2.3: Implementation of a National Foot and Mouth Disease Control Strategy

381. Allocation of funds towards training veterinary professionals and farmers is crucial to ensure that they can recognize the clinical signs of FMD accurately. Approximately USD 2 million should be allocated for conducting training workshops, developing educational materials, and organizing practical sessions for both professionals and farmers. To ensure early detection and prompt response, training programs for veterinary professionals and farmers should commence in the first year of the strategy. These training sessions should focus on educating individuals about the early detection and prompt reporting of outbreaks, leading to more effective control measures. Continuous training should take place throughout the ten-year plan to update knowledge and enhance diagnostic skills.

382. To enhance surveillance and timely reporting of FMD cases, it is essential to establish a network of reporting mechanisms. Approximately USD 1 million should be allocated to develop a centralized reporting system, including a toll-free hotline, mobile applications, and online portals. These mechanisms will enable rapid communication between farmers, veterinary professionals, and relevant authorities, facilitating quick response and control measures. The implementation of a network of reporting mechanisms, which includes both centralized and decentralized systems, should begin in the first year and continue throughout the plan. This network will enable the timely reporting of suspected FMD cases, facilitating swift intervention and control measures. It is crucial to ensure that all stakeholders, including farmers, veterinary professionals, and government agencies, are part of this network to promote effective communication and quick response.

383. Regular monitoring programs play a pivotal role in assessing the disease prevalence and evaluating the effectiveness of control measures. Allocating USD 1.5 million towards implementing these programs will allow for the collection of comprehensive data on FMD prevalence, geographical spread, and vaccination coverage. This data will help in developing targeted control strategies and monitoring progress over time. Regular monitoring programs, which involve active surveillance and sero-monitoring of the animal population, should commence early in the strategy, ideally in the second year. These programs will help assess disease prevalence, identify high-risk areas, and track the effectiveness of control measures. The data generated from these monitoring programs will guide decision-making and enable adjustments to the strategy, if necessary.

384. Promoting good hygiene practices is essential to prevent the spread of FMD. Public awareness campaigns, workshops, and consultations should be conducted to educate farmers and livestock handlers about the significance of implementing these practices effectively. Approximately USD 500,000 should be allocated towards awareness campaigns, training sessions, and the development of educational materials on disinfection protocols, proper waste management, and controlled animal movement. These initiatives will improve biosecurity measures and reduce the risk of disease transmission. Promoting good hygiene practices, such as disinfection protocols, proper waste management, and controlled animal movement, should start in the first year and continue throughout the entire ten-year plan.

385. To achieve successful disease control, an adequate supply of vaccines is crucial. Collaborations with vaccine manufacturers and suppliers are necessary to ensure a consistent supply of high-quality vaccines. Approximately USD 4 million should be allocated towards vaccine procurement, including cold cabinets, ice liners, and refrigerators for proper storage. This investment will ensure the availability of high-quality vaccines throughout the vaccination campaigns. Procurement of cold cabinets and FMD vaccines should commence in the first year to ensure an adequate supply throughout the strategy. Cold cabinets, including ice liners and refrigerators, are essential for maintaining the potency of vaccines.

386. Mass vaccination campaigns are a vital component of FMD control strategies. Allocating USD 4.5 million towards organizing vaccination campaigns at regular intervals will enable the vaccination of the entire susceptible population of bovines and small ruminants. Additionally, primary vaccination of bovine calves should be prioritized, with USD 1 million allocated for this purpose. Deworming one month prior to vaccination should also be included, with an allocation of USD 500,000. Vaccination campaigns targeting the entire susceptible population of bovines and small ruminants should be organized at six-monthly intervals starting from the second year of the strategy. These campaigns aim to achieve a high level of immunity within the population, minimizing the risk of FMD transmission. Primary vaccination of bovine calves at 4-5 months of age should be conducted one month after deworming to enhance vaccine efficacy.

387. Recording vaccination details through Animal Health cards and identifying target animals through ear-tagging and registration are essential for effective disease control. Allocating USD 500,000 towards maintaining records and uploading data in an Animal Productivity and Health Information System will facilitate monitoring and evaluation of the FMD program's impact. To track the vaccination status of individual animals, maintaining records through Animal Health cards should be implemented starting from the second year. These cards will contain essential information such as the animal's identification number, vaccination dates, and vaccine type administered. Regular audits and data analysis should be conducted to ensure accurate record-keeping and monitor vaccination coverage.

388. The identification of target animals through ear-tagging, registration, and uploading data in an Animal Productivity and Health Information System should be implemented from the third year onwards. This system will facilitate data management, enabling efficient monitoring of vaccination coverage, disease prevalence, and other relevant parameters.

389. To promptly identify and control outbreaks, allocating USD 1.5 million towards serosurveillance, virus isolation, and typing is essential. Testing pre-vaccination and post-vaccination samples will provide valuable data on vaccine efficacy and disease prevalence. Sero-surveillance and virus isolation, including typing, should be initiated from the third year to enhance disease surveillance and control. This will involve regular sampling of animals to monitor antibody levels and identify any changes in virus strains. In case of an outbreak, prompt investigation and virus isolation will aid in implementing appropriate control measures.

390. Recording and regulating animal movement through temporary quarantine/checkposts should be established from the third year. Strict adherence to movement regulations is crucial in preventing the spread of FMD from high-risk to low-risk areas. Temporary quarantine facilities should be established to ensure proper inspection and monitoring of animals entering or leaving a specified region.

391. Testing of pre-vaccination and post-vaccination samples should begin from the fourth year to assess vaccine efficacy and monitor the immune response in the target population. These tests will provide valuable data to evaluate the effectiveness of the vaccination campaigns and identify any gaps or areas requiring improvement.

392. The generation of data and regular monitoring, including the evaluation of the impact of the program, should be conducted throughout the entire ten-year strategy. This ongoing evaluation will help assess the effectiveness of control measures, identify areas requiring adjustments, and provide valuable insights for future disease control strategies.

393. To enhance the skills and knowledge of stakeholders involved in FMD control, allocating USD 2 million towards capacity-building programs and training sessions is crucial. These programs will ensure that government agencies, farmers' associations, and veterinary professionals are equipped with the necessary skills and knowledge to implement effective control measures. These programs aim to enhance knowledge, skills, and awareness about FMD control strategies, ensuring effective implementation through a well-informed workforce. Capacity-building programs and training sessions for veterinary professionals, farmers, and other stakeholders should be conducted from the first year and continue regularly throughout the ten-year plan.

394. Finally, allocating USD 1 million towards publicity and mass awareness campaigns at national, state, block, and village levels is necessary. These campaigns will educate farmers about the importance of immunization, raise awareness about FMD prevention measures, and ensure community participation in disease control efforts. Publicity and mass awareness campaigns at national, state, governorate, district, block, and village levels, including orientation of state functionaries, should be initiated from the first year. These campaigns will create awareness about FMD, emphasize the importance of immunization, and promote good hygiene practices. Collaboration between government agencies, farmers' associations, veterinary professionals, and other stakeholders is crucial for reaching a wide audience and ensuring effective implementation of the awareness campaigns.

Programme 2.4: Establishment of Preventive and control measures for an effective control of Lumpy Skin Disease

395. Slaughter campaigns, which involve culling infected animals, play a critical role in preventing the spread of diseases. These campaigns require adequate funding for the identification, testing, and disposal of infected animals. Approximately USD 2.25 million, should be allocated to slaughter campaigns. This allocation ensures prompt and effective containment of outbreaks, minimizing the risk of further transmission. The commencement of such campaigns depends on a variety of factors, including the nature and magnitude of the disease. Typically, slaughter campaigns begin within the first year of the strategy implementation. However, the duration of these campaigns is contingent upon the effectiveness of other control measures being simultaneously implemented. Consequently, the conclusion of slaughter campaigns can range from a few months to several years, based on the progress made in disease containment.

396. Maintaining hygiene and biosecurity standards is paramount in preventing the onset and spread of diseases. Allocating USD 1.5 million towards management strategies would facilitate the

implementation of robust biosecurity measures, training programs, and monitoring systems. This allocation would enhance disease prevention and minimize the chances of outbreaks occurring in the first place.

397. The implementation of management strategies, which primarily involve maintaining hygiene and biosecurity standards, is an ongoing process throughout the ten-year strategy. These strategies focus on preventing disease transmission within and between animal populations. The initiation of management strategies should ideally coincide with the beginning of the strategy, ensuring immediate action to minimize the risk of disease spread. However, due to the complexity of implementing and enforcing stringent biosecurity measures, it may take several months or even up to a year to fully establish these protocols. Thus, the conclusion of management strategies can extend beyond the initial years of the strategy, potentially continuing until the strategy's completion.

398. To prevent the spread of diseases, strict movement control measures are imperative. Allocating USD 1 million towards quarantine efforts would enable the establishment of effective control zones, surveillance checkpoints, and enforcement mechanisms. This allocation would significantly reduce the risk of disease transmission between regions. Quarantine procedures should be implemented early on in the strategy, preferably within the first year, to effectively isolate infected animals. The duration of movement control measures largely depends on the effectiveness of other control interventions and the eradication progress achieved. As the strategy progresses, the intensity of movement control measures may be gradually reduced, resulting in their conclusion towards the later years of the ten-year plan.

399. Enhanced surveillance and diagnosis systems are crucial for early detection and effective response to disease outbreaks. Allocating USD 2 million towards this strategy would support the implementation of advanced diagnostic technologies, strengthening laboratory infrastructure, and training healthcare personnel. This allocation would enhance disease monitoring capabilities and enable swift action when outbreaks occur. The initiation of enhanced surveillance and diagnosis should coincide with the beginning of the strategy, ensuring early detection and effective response. However, the conclusion of these activities may vary based on the prevalence of the disease, the availability of accurate diagnostic tools, and the overall success of disease control efforts. As the strategy evolves, surveillance and diagnosis activities may be adapted, leading to their conclusion in the later years of the ten-year plan.

400. Allocation of USD 1.5 million towards research and development initiatives would foster innovation in disease control measures. This budget would support studies on emerging pathogens, development of new vaccines, and improvement of diagnostic tools. Research and development play a pivotal role in staying one step ahead of evolving diseases and ensuring long-term preparedness. Research and development initiatives should begin early in the ten-year strategy to facilitate evidence-based decision-making and support the implementation of effective control measures. Research and development are ongoing processes that extend beyond the timeline of the strategy contributing to future disease control strategies.

401. To effectively respond to disease outbreaks, a robust healthcare infrastructure is vital. Allocating USD 1.25 million towards healthcare infrastructure would enhance veterinary services, establish emergency response centers, and improve communication networks. This allocation would bolster the

capacity to promptly address outbreaks and minimize their impact on both animal and human health. The initiation of efforts to strengthen healthcare infrastructure should be prioritized at the beginning of the strategy to ensure adequate resources and facilities to respond to disease outbreaks. However, the conclusion of these activities may extend beyond the initial years of the plan, as healthcare infrastructure requires continuous improvement to sustain disease control efforts in the long term.

402. Vaccination is a cornerstone strategy in controlling diseases. Allocating USD 1 million towards vaccination programs would facilitate the development and distribution of vaccines, covering a significant population of susceptible animals. This allocation would contribute to herd immunity, reducing the overall disease burden. The initiation of vaccination campaigns should coincide with the early stages of the strategy, aiming to protect susceptible populations and prevent disease transmission. The duration of vaccination campaigns can vary based on factors such as vaccine availability, coverage rates, and the specific disease's characteristics. While some diseases may require ongoing vaccination efforts, others can be successfully controlled within a few years. Therefore, the conclusion of vaccination campaigns will largely depend on the specific disease being targeted.

403. Raising awareness among affected communities is crucial in preventing the spread of diseases and ensuring early reporting of symptoms. Allocating USD 1 million towards health promotion and education initiatives would support the development of educational materials, training programs, and awareness campaigns. This allocation would empower communities to actively participate in disease prevention efforts. Health promotion and education initiatives should be initiated early in the strategy, alongside other control measures. These activities should continue throughout the ten-year plan, as sustained awareness and education are crucial for maintaining compliance with disease control protocols. Therefore, the conclusion of health promotion and education activities will coincide with the completion of the strategy.

Programme 2.5: Implementation of an Animal brucellosis Control and eradication Strategy

404. Well-equipped and staffed diagnostic laboratories play a vital role in early detection and diagnosis of brucellosis. To strengthen this aspect of the strategy, approximately $5 million, should be allocated towards upgrading existing laboratories and training personnel. This investment will enhance diagnostic capabilities, leading to more accurate and timely identification of infected animals and humans. In the first three years of the strategy, the necessary infrastructure, equipment, and personnel should be put in place. This includes the procurement of diagnostic tools, establishment of quality control measures, and training of laboratory personnel in the latest diagnostic techniques.

405. Effective coordination and exchange of data between public health and animal health authorities are crucial for successful control of brucellosis. Allocating $2 million towards establishing robust data-sharing systems and vertical and horizontal feedback mechanisms will enable timely information exchange, facilitating prompt decision-making and effective control measures. This process should start in the first year and continue throughout the entire ten-year strategy. Vertical and horizontal communication channels should be established to facilitate the exchange of data, information, and feedback reports. Regular meetings and joint workshops should also be organized to ensure seamless collaboration and information sharing.

406. To ensure the progress of the brucellosis control program, $1 million should be allocated to conducting annual evaluations. These assessments will identify any shortcomings or areas of improvement, leading to the adoption of appropriate corrective actions or alternative strategies. Regular evaluation is essential for maintaining the efficacy of the program in the face of evolving challenges. To monitor the progress of the brucellosis control program, annual evaluations should be conducted. The evaluation should be comprehensive and include both qualitative and quantitative measures. Based on the findings, appropriate adjustments should be made to ensure the continued success of the program.

407. Considering the long duration and cost of brucellosis control programs, integration with other animal health initiatives is critical. Allocating $3 million towards integration efforts will foster collaboration and resource-sharing, enabling a more comprehensive approach to disease control. Integration will help streamline efforts and maximize the impact of limited resources. This integration should be initiated in the early years and continue throughout the ten-year period. By leveraging existing resources, expertise, and infrastructure, the program can achieve greater efficiency and effectiveness. Collaboration with other disease control programs will also help in sharing best practices and lessons learned.

408. Given the nature of livestock movements, international collaboration is essential to ensure the sustainability of efficient brucellosis control programs. Allocating $2 million towards international collaboration and commitments will facilitate the exchange of expertise, resources, and best practices. This investment will help address the challenges posed by transboundary movements and strengthen global efforts to control brucellosis. This collaboration should be established from the outset and maintained throughout the ten-year strategy. Cooperation with neighboring countries, international organizations, and relevant stakeholders will facilitate the exchange of information, resources, and expertise, thereby enhancing the control efforts.

409. To enforce control measures effectively, legislation may need to be promulgated or amended. Allocating $500,000 towards endorsing appropriate legislation will provide a solid legal foundation for implementing control strategies. This investment will ensure compliance and enable authorities to take necessary actions against non-compliant individuals or entities. This process should be initiated as early as possible to ensure legal frameworks are in place to address the specific requirements of the control program. Collaboration with legal experts, policymakers, and relevant stakeholders is necessary to draft and endorse effective legislation.

410. Collaboration within and among animal and public health sectors, as well as with international organizations, is essential for successful brucellosis control. Allocating $2 million towards fostering intersectoral collaboration will facilitate joint efforts, resource-sharing, and knowledge exchange. This investment will strengthen the overall response and improve the effectiveness of control strategies. This collaboration should start from the beginning and continue throughout the entire ten-year strategy. Regular meetings, joint task forces, and shared resources should be established to foster collaboration and coordination. Collaboration with international organizations, such as the World Health Organization and the World Organization for Animal Health (OIE), should also be pursued to leverage their expertise and resources.

411. Strict biosafety and management measures are crucial to prevent the spread of brucellosis on livestock farms. Allocating $1.5 million towards implementing and enforcing these measures will minimize disease transmission and protect both animals and humans. This investment will focus on infrastructure improvements, training programs, and regular inspections to ensure compliance.

412. This includes the establishment of effective biosecurity protocols, regular monitoring of farms, and training of personnel on biosafety practices. These measures should be implemented from the beginning and maintained throughout the entire duration of the strategy.

413. To address the role of environmental factors in disease transmission, allocating $500,000 towards improving environmental hygiene and sanitation is necessary. This investment will support initiatives aimed at reducing contamination and improving waste management practices. Proper environmental hygiene will contribute to breaking the transmission cycle and reducing the prevalence of brucellosis. Proper waste management, disinfection protocols, and hygiene practices should be implemented and monitored regularly. These measures should be initiated early in the strategy and continued throughout the ten-year period to maintain a clean and disease-free environment within livestock farms.

414. Vaccination is a crucial component of brucellosis control programs. To ensure vaccine quality and efficacy, $2.5 million should be allocated towards sourcing vaccines from approved international reference laboratories. This investment will guarantee the use of certified seed batch strains, minimizing the risk of vaccine failure. Additionally, $3 million should be allocated for vaccination of animals and humans at risk and immunization of susceptible populations. Vaccines should originate from a reliable source and undergo quality certification by an approved international reference laboratory. Vaccination protocols for both animals and humans should be established and followed. Vaccination campaigns should be initiated early in the strategy and continued throughout the ten-year period to ensure maximum coverage and protection.

415. To implement effective control measures, it is essential to empower public and animal health sectors with sufficient resources and legal support. Allocating $1.5 million towards providing technical and financial resources, as well as an appropriate legal background, will strengthen these sectors' capacity to combat brucellosis. This investment will support training programs, capacity building, and resource allocation. This includes securing funding, allocating resources, and providing continuous training and capacity-building opportunities. An appropriate legal background should also be established to support the sectors in their control efforts.

416. To ensure the safe and effective use of vaccines, $500,000 should be allocated towards training animal health personnel on cold chain maintenance and safe vaccine administration. This investment will enhance their skills and knowledge, reducing the risk of vaccine wastage and maximizing the impact of vaccination campaigns. This training should be conducted regularly to ensure that personnel are up-to-date with the latest best practices and techniques. The training should cover various aspects, including vaccine storage, handling, administration, and adverse event management.

417. To protect humans at risk, allocating $1 million towards personal protection measures and awareness programs is crucial. This investment will provide necessary equipment, such as gloves and masks, and enhance public awareness regarding brucellosis transmission, prevention, and early

recognition of symptoms. Awareness programs should be developed and implemented to educate both animal health personnel and the general public on the importance of personal protection measures, such as wearing personal protective equipment and practicing good hygiene. These programs should be initiated early and sustained throughout the entire ten-year strategy.

418. Awareness programs should be conducted regularly to educate the public about brucellosis, its transmission, and prevention. These programs should target livestock owners, farmers, veterinarians, and the general public. Various communication channels, such as workshops, seminars, educational materials, and social media campaigns, should be utilized to disseminate information and raise awareness about the disease.

Programme 2.6: National Strategy for Prevention and Control of Avian Influenza

419. Timely diagnosis is essential in preventing the spread of avian influenza. To achieve a significant reduction in diagnosis time, a portion of the budget, approximately USD 2 million, should be allocated to enhancing laboratory facilities, such as investing in advanced diagnostic equipment and training laboratory personnel. Research and development efforts should be supported, focusing on the development of rapid diagnostic tests that can detect avian influenza within six hours. These efforts will begin in year one and are expected to be fully operational, reducing diagnosis time to less than six hours, by year three.

420. To strengthen surveillance and response capabilities, approximately USD 1.5 million should be allocated to enhancing technology and infrastructure for disease monitoring. This includes the establishment of a centralized surveillance system that enables real-time data sharing between farms, veterinary authorities, and relevant stakeholders. Investing in training programs for veterinarians to improve their surveillance and response skills should also be prioritized. The surveillance activities will commence in year one and continue throughout the entire ten-year period. This includes regular monitoring of farms for disease occurrence and rapid response protocols to alert others of the danger when an outbreak occurs.

421. To ensure the timely reporting of suspected outbreaks, approximately USD 500,000 should be allocated to the development of a user-friendly digital platform that facilitates the efficient reporting of suspected cases. This platform should be accessible to farmers, veterinarians, and other key stakeholders, enabling them to report outbreaks promptly and accurately. This reporting system will be established in year one, enabling immediate response measures to be implemented.

422. Investing approximately USD 1.5 million in prevention strategies is crucial to mitigating the risk of avian influenza. This includes promoting biosecurity measures on farms, such as strict hygiene practices, proper waste management, and controlled access to poultry facilities. A significant portion of the budget should also be allocated to public awareness campaigns that educate poultry farmers and the general public about preventive measures. The ten-year plan places significant emphasis on preventive measures such as vaccination campaigns, biosecurity enhancements, and farm management practices. These prevention activities will commence in year one and continue throughout the entire duration of the strategy.

423. Approximately USD 1 million should be directed towards monitoring avian influenza on farms. This includes the establishment of a comprehensive farm-level surveillance system, regular testing of

poultry flocks, and the training of farmers in recognizing symptoms of the disease. Rapid response protocols should also be developed and communicated to ensure quick actions in the event of an outbreak. This proactive monitoring system will be established in year one and will continue throughout the entire ten-year period. The goal is to promptly alert others of potential outbreaks and implement necessary control measures.

424. Considering the potential transmission of avian influenza from animals to humans, allocating USD 500,000 to monitor other animals susceptible to the virus is essential. This includes conducting surveillance and research on potential intermediate hosts, such as swine, wild birds, and other domestic animals. Strengthening collaborations with relevant authorities and research institutions will be pivotal in achieving effective monitoring strategies. This monitoring program will commence in year one and continue throughout the entire ten-year period.

425. To enhance regional collaboration in avian influenza surveillance and response, approximately USD 1 million should be allocated to establish a regional task force. This task force would facilitate information exchange, joint research initiatives, and the development of regional response plans. Strengthening partnerships with neighboring countries will ensure a coordinated and effective approach to combating avian influenza. This regional cooperation will be established in year one and will continue throughout the ten-year period.

426. Allocating USD 500,000 to the creation of a National Technical Commission is essential in fostering inter-ministerial collaboration. This commission would facilitate the exchange of information, analysis of data, and the development of integrated strategies between the ministries of health, agriculture, and environment. Expertise from each sector will be harnessed to develop comprehensive and effective policies. This commission will be established in year one and will continue throughout the ten-year period, facilitating coordination and cooperation between the ministries of health, agriculture, and environment.

427. Approximately USD 1.5 million should be allocated to strengthening quarantine and movement control measures. This includes upgrading quarantine facilities, enhancing border surveillance, and implementing strict biosecurity protocols in poultry transportation. Adequate training and resources should be provided to ensure the effective implementation of these measures. The strategy proposes the establishment of comprehensive quarantine protocols and movement controls in year one, which will continue throughout the entire ten-year period.

428. To prevent and control avian influenza, approximately USD 1.5 million should be invested in research and development of vaccines and antiviral drugs. This would support the efforts to develop effective preventive measures, such as vaccines for poultry and antiviral treatments for infected birds. Additionally, funding should be allocated to the deployment of vaccination campaigns in high-risk areas. The strategy highlights the need for increased funding in research, vaccine production, and infrastructure development. This investment will begin in year one and will continue throughout the entire duration of the strategy.

429. Collaboration with international organizations, such as the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), is crucial in combating avian influenza effectively. Approximately USD 500,000 should be allocated to foster partnerships and support joint initiatives.

This would include funding participation in international conferences, workshops, and research projects, as well as leveraging expertise and resources available through these organizations. The strategy emphasizes the establishment of partnerships with relevant organizations in year one, fostering cooperation in research, surveillance, and response efforts throughout the entire ten-year period.

430. To ensure effective coordination and implementation of strategies, approximately USD 500,000 should be allocated to establish a dedicated unit within the Ministry of Agriculture and Irrigation. This unit would oversee the implementation of avian influenza prevention and control measures, monitor progress, and facilitate coordination with relevant stakeholders at the national level. This partnership will ensure coordinated efforts in implementing prevention and control measures. The national-level conduct will commence in year one and continue throughout the entire ten-year period.

431. Approximately USD 1 million should be allocated to stamping out operations. This includes funding for culling infected and exposed birds, ensuring proper disposal of carcasses and animal products, and thorough decontamination of affected premises. Adequate resources and training should be provided to ensure the safe and effective execution of these operations. The strategy emphasizes the culling of all infected and exposed birds, the correct disposal of carcasses and animal products, and thorough decontamination of infested premises. These control measures will be implemented as soon as an outbreak occurs and will continue until the risk has been eliminated.

432. To foster risk communication and community engagement, approximately USD 500,000 should be allocated to developing targeted communication campaigns. These campaigns should educate communities about avian influenza risks, preventive measures, and the importance of reporting suspected cases promptly. Engaging local leaders, community groups, and social media platforms will help disseminate accurate information and promote community involvement. The strategy proposes the implementation of risk communication and community engagement strategies in year one, which will continue throughout the entire ten-year period.

433. Investing approximately USD 1 million in promoting hygiene and biosecurity standards is crucial in preventing avian influenza outbreaks. This includes providing training and resources to farmers, ensuring the availability of disinfectants and protective equipment, and conducting regular inspections to enforce compliance with hygiene and biosecurity standards. The strategy highlights the need for strict adherence to hygiene and biosecurity standards, which will be continuously monitored and enforced throughout the ten-year period.

434. To detect human infections early and implement effective containment measures, approximately USD 2 million should be allocated to strengthening human surveillance systems. This includes improving laboratory capacities for human testing, training healthcare professionals on detecting and reporting human cases, and establishing efficient communication channels between human and animal health sectors. The strategy emphasizes the establishment of early detection systems for human infections and the implementation of containment measures. These activities will commence in year one and continue throughout the entire ten-year period.

435. Allocating USD 500,000 to public awareness campaigns is crucial in ensuring community understanding and cooperation. These campaigns should educate the public about avian influenza

risks, symptoms, preventive measures, and the importance of early reporting. Utilizing various communication channels, such as television, radio, social media, and community outreach programs, will maximize the reach and impact of these campaigns. The strategy proposes the implementation of public awareness campaigns in year one, which will continue throughout the entire ten-year period. These campaigns will educate the public about avian influenza, its transmission, and prevention measures.

Programme 2.7: National Strategy for Prevention and Control of Rift Valley fever

436. Controlling animal movements is crucial in preventing the spread of RVF. Resources should be allocated towards establishing efficient surveillance systems, quarantine measures, and border controls to restrict the movement of infected animals. Financial support for veterinary training programs and the provision of necessary equipment for clinical management of RVF cases is essential. Approximately USD 3 million, should be allocated for this purpose. The first year of the ten-year strategy will focus on the initiation of control measures for animal movements. However, it is important to note that clinical management of RVF cases would commence simultaneously with the implementation of movement controls and continue throughout the entire strategy.

437. Slaughterhouses serve as potential hotspots for disease transmission. Allocating funds towards implementing stringent biosecurity measures, routine inspections, and training programs for slaughterhouse personnel is imperative. It is recommended that USD 2 million be dedicated to ensuring adequate controls at slaughterhouses. It is imperative to implement strict controls at these facilities to minimize the risk of RVF transmission. Research by the Food and Agriculture Organization (FAO) suggests that the establishment of control measures at slaughterhouses should be initiated within the first two years of the strategy. This allows for the necessary infrastructure modifications, training of personnel, and the development of proper protocols to be put in place.

438. Mosquitoes, which act as vectors for RVF, breed in standing water. Therefore, draining standing water to eliminate or reduce mosquito populations is a critical preventive measure. Approximately USD 1 million should be allocated for draining standing water and implementing sustainable water management practices. The Centers for Disease Control and Prevention (CDC) recommends this activity as a long-term measure that should be initiated within the first three years of the strategy, with continuous efforts throughout the ten-year period.

439. Similarly, low depression accumulations of water provide breeding grounds for mosquitoes. Allocating funds towards the disinfestation of such sites through the use of larvicides or controlled burning is essential. Approximately USD 1 million should be allocated for this purpose. To ensure effective control, disinfestation efforts should be initiated within the first four years of the strategy and continued regularly thereafter. The Journal of Medical Entomology suggests that the use of larvicides, such as 140ethoprene spraying or controlled burning, can be effective in reducing mosquito populations in such areas.

440. Methoprene spraying and controlled burning have shown effectiveness in reducing mosquito populations. It is recommended that USD 1.5 million, accounting for 10% of the budget, be allocated for the use of these methods as part of an integrated vector control program. Prophylactic measures, including monitoring risk factors and vector populations, play a crucial role in preventing RVF

outbreaks. These measures should be implemented from the start of the strategy and continued throughout the entire ten-year period. Ongoing surveillance and monitoring are necessary to detect any potential risks or changes in the disease landscape.

441. Monitoring risk factors and vector populations is vital for early detection and response to RVF outbreaks. Allocating funds towards surveillance systems, research, and data analysis should be prioritized. It is recommended that USD 2.5 million be allocated for prophylactic measures.

442. Mass animal vaccination campaigns are crucial in preventing RVF outbreaks. However, attention must be given to the safe administration of vaccines to avoid inadvertent transmission of the virus. To address this issue, USD 1.5 million should be allocated for the procurement of attenuated virus vaccines, single injection regimens of inactivated virus vaccines, and safe vaccination practices. It is essential to ensure that these campaigns are conducted safely and efficiently. However, there is a risk of inadvertently transmitting the virus through the use of multi-dose vials and the re-use of needles and syringes. To address this concern, the implementation of strict protocols and the use of single-dose vials should be initiated within the first five years of the strategy.

443. The use of vaccines is crucial in preventing and controlling RVF. The attenuated virus vaccine, which confers immunity lasting three years and is safe for all breeds of cattle, sheep, and goats, should be incorporated into the strategy from the beginning. On the other hand, the inactivated virus vaccine, which requires a booster 3-6 months after initial vaccination, followed by yearly boosters, should be reserved for outbreak situations and pregnant animals. These vaccines should be readily available and accessible throughout the entire ten-year period.

444. Education plays a pivotal role in raising awareness and ensuring compliance with preventive measures. Allocating funds towards educational campaigns, training programs, and the dissemination of information is paramount. It is recommended that USD 1 million be allocated for promoting education among personnel. Education initiatives should be initiated from the start and continued throughout the ten-year period to ensure that personnel are equipped with the necessary knowledge and skills to effectively combat RVF.

445. Early detection of new RVF cases is crucial for swift response and control. Allocating funds towards the establishment of an active animal health surveillance system, including laboratory facilities and trained personnel, is essential. It is recommended that USD 1.5 million be allocated for this purpose. This surveillance system should be established within the first year of the strategy and maintained throughout the entire ten-year period to ensure timely detection and response to any potential outbreaks.

Programme 2.8: National Strategy for Prevention and Control of Clostridia infection

446. The activity to improve access to diagnosis and treatment for clostridia infections should start in year 1. This will include expanding diagnostic capabilities, ensuring adequate supplies of antibiotics, and training healthcare providers on effective treatment protocols. By year 3, significant progress should be made in expanding access to these essential services.

447. Strengthening laboratory capacity should start in year 2 to build upon the improved access to diagnosis and treatment. Strengthening laboratory capacity involves upgrading equipment, training laboratory personnel, and implementing standardized diagnostic procedures. This process takes time,

and year 5 will provide a realistic timeframe for making substantial improvements in laboratory capabilities.

448. Establish antibiotic stewardship programs should start in year 3 to ensure that antibiotic use is optimized, and that resistance is minimized. Antibiotic stewardship programs require collaboration between healthcare providers, pharmacists, and infection prevention specialists. By year 6, it is wished that these programs are well-established and integrated into routine healthcare practices.

449. Promotion of hospital infection control programs should start in year 4, to address the risk of clostridia infections in healthcare settings. Hospital infection control programs focus on preventing the spread of infections through hand hygiene, environmental cleaning, and proper wound care. By year 7, it is wished that these programs are effectively implemented and ingrained into hospital culture.

450. Public awareness and education campaigns should start in year 1 to raise public awareness about clostridia infections and their prevention. This includes educating the public about risk factors, symptoms, and the importance of seeking prompt medical attention if symptoms arise. By year 4, public awareness should have increased significantly.

451. Educating high-risk groups should start in year 2 to target specific groups at higher risk of clostridia infections, such as individuals with chronic illnesses or those undergoing certain medical procedures. By year 5, targeted education should have reached these high-risk groups, empowering them to take preventive measures and seek appropriate care if needed.

452. Public awareness and education campaigns utilizing diverse communication channels should start in year 3, to build upon the development of targeted educational materials. By year 6, these materials should be ready for dissemination through various channels, including radio, television, social media, and printed materials. This timeframe will allow for a sustained and consistent effort to reach a wider audience.

453. Promoting proper hygiene practices should start in year 4 to complement the workshops and training programs (Year 3-4) that focus on animal owners. By year 4, the concept of proper hygiene practices will be introduced to animal owners, and this activity can focus on broader public awareness and education. The seven-year timeframe allows for ongoing reinforcement of hygiene practices and adaptation to changing public health needs.

454. Encouraging vaccination should start in year 5 to capitalize on the momentum gained from developing vaccine availability (Year 1-4) and integrating vaccination into routine healthcare (Year 2-5). By year 5, vaccination programs should be well-established, and this activity should focus on promoting vaccine uptake among the general public. The eight-year timeframe allows for addressing vaccine hesitancy and encouraging sustained vaccination practices.

455. Expanding vaccine availability should start in year 1 to ensure that high-quality vaccines are readily available for vaccination campaigns and routine healthcare. The four-year timeframe allows for securing procurement contracts, establishing storage facilities, and implementing quality assurance measures.

456. Integrating vaccination into routine healthcare should start in year 2 to align with the development of comprehensive vaccination plans (Year 1-2). By year 2, vaccination plans should be finalized, and

this activity should focus on integrating vaccination into the standard practices of healthcare providers. The five-year timeframe allows for gradual integration and adaptation within the healthcare system.

457. Targeting specific populations should start in year 3 to identify and prioritize specific populations at higher risk of rabies exposure or transmission. By year 3, data from surveillance systems (Year 1-3) and risk factor studies (Year 3-4) should be available to inform targeted vaccination strategies. The six-year timeframe allows for reaching these specific populations effectively and efficiently.

458. Monitoring vaccine effectiveness should start in year 4 to assess the impact of vaccination campaigns and routine healthcare integration. By year 4, sufficient data should be available from vaccination records and serological surveys to evaluate vaccine effectiveness. The seven-year timeframe allows for ongoing monitoring and adjustments to vaccination strategies as needed.

459. Promoting vaccine confidence should start in year 5. This is the year after the initial research funding allocation (Year 1-2). During year 5, researchers should have a better understanding of the reasons behind vaccine hesitancy and should start developing targeted interventions to promote vaccine confidence. This will allow a sustained effort to address vaccine hesitancy and build public trust in vaccines by year 8. Changing attitudes and behaviors takes time, and eight years provides a realistic timeframe to make significant progress in promoting vaccine confidence.

460. Supporting research on clostridial pathogens should start in year 1 and end by year 5. This is the beginning of the 10-year strategy, ensuring immediate attention to understanding the biology and pathogenesis of clostridial infections. This allows a focused period of research on clostridial pathogens, generating insights into their behavior, virulence mechanisms, and potential therapeutic targets.

461. Developing novel diagnostics should start in year 2. This follows the initial research funding allocation and the identification of research priorities in year 1. Ending by year 6 should provide a timeframe for developing and validating novel diagnostic tools, ensuring they are accurate, sensitive, and adaptable to various clinical settings.

462. Supporting antibiotic development should start in year 3. This follows the initial research funding allocation and the identification of research priorities in years 1 and 2. By year 7, the activity should provide a timeframe for exploring new antibiotic targets.

463. Exploring alternative prevention strategies should start in year 4. This follows the initial research funding allocation and the identification of research priorities in Years 1-3. Ending by year 8 will provide a timeframe for investigating alternative prevention strategies.

464. Promoting vaccine research should start in year 5. This follows the initial research funding allocation and the identification of research priorities in years 1-4. Ending by year 10 should allow a long-term investment in vaccine research, allowing for the development of next-generation vaccines with improved efficacy, safety, and thermostability.

465. Strengthening infection control practices should start in year 1. This will ensure immediate attention to improving infection control practices in healthcare settings. Ending by year 7 should provide a sustained effort to implement and reinforce effective infection control practices, reducing the risk of clostridial infections and promoting patient safety.

466. Strengthening infection control practices should start in year 1. This will ensure developing comprehensive hand hygiene protocols and guidelines aligned with national and international

standards. By year 2, the Implementation of hand hygiene training programs for all healthcare staff, including nurses, doctors, and support personnel should be effective. Regular audits and monitoring should be conducted to assess hand hygiene compliance and identify areas for improvement by year 3.

467. Environmental cleaning should start in year 2, by establishing standardized cleaning procedures for different areas of the healthcare facility, including patient rooms, operating rooms, and laboratories. By year 3, training to cleaning staff on effective cleaning techniques, disinfection protocols, and the use of personal protective equipment should be provided. Regular environmental audits to ensure that cleaning practices are being followed correctly and that surfaces are adequately disinfected should be conducted by year 4.

468. Proper wound care should start in year 3 by developing and implementing wound care guidelines for different types of wounds. By year 4, the training to healthcare staff on proper wound assessment, cleansing, dressing, and documentation should be provided. By year 5, regular audits to assess wound care practices should be conducted and identification of opportunities to improve patient outcomes and prevent wound infections provided.

469. Antibiotic stewardship should start in year 4 by establishing an antibiotic stewardship program with a dedicated team of pharmacists, infectious disease specialists, and other healthcare providers. Year 5 should see the development and implementation of antibiotic prescribing guidelines for various infections, emphasizing the use of antibiotics and avoiding unnecessary antibiotic use. In Year 6 the monitoring of antibiotic use patterns, tracking of antimicrobial resistance trends, and provision of feedback to prescribers on optimization of antibiotic use should be effective.

470. Staff education and training should start in year 5 with the development of ongoing education and training programs for healthcare staff on infection prevention and control practices, including hand hygiene, environmental cleaning, wound care, and antibiotic stewardship. In year 6, regular in-service training sessions, workshops, and simulation exercises to reinforce infection prevention and control practices should be conducted. Year 7 infection prevention and control topics should be incorporated into the curricula of healthcare training programs for nurses, doctors, and other healthcare professionals.

471. Establishing surveillance networks should start in year 1 by identifying key stakeholders and partners involved in clostridia infection surveillance, including hospitals, laboratories, public health agencies, and research institutions. In year 2 the development of standardized surveillance protocols and reporting forms for clostridia infections should be effective. Year 3 should see the establishment of a centralized surveillance network to collect, analyze, and disseminate data on clostridia infections across the healthcare system.

472. Standardizing reporting should start in year 2. By then the surveillance network should be established, and there should be a clear understanding of the data being collected. This will be the ideal time to start developing standardized reporting forms to ensure that data is collected and reported in a consistent and comparable manner. Ending year 4, will allow for sufficient time to develop, pilot test, and finalize standardized reporting forms. It will also allow for training of personnel on how to use the forms and for implementation of the standardized reporting system.

473. Utilizing electronic systems should start in Year 3. By Year 3, a significant amount of data should have been collected through the surveillance network. This should be the ideal time to start implementing electronic data management systems to store, manage, and analyze the data. By year 5 the selection and procurement of an appropriate electronic data management system should be done, training of personnel on how to use the system, and data migration from existing systems to the new system should be effective.

474. Analyzing surveillance data should start in year 4. There should be enough data collected to start conducting regular data analysis. This analysis will help to identify trends, patterns, and areas of high rabies incidence. By year 6, sufficient time to conduct regular data analysis and to generate reports and other outputs that can be used to inform decision-making and resource allocation will be provided.

475. Disseminate findings should start in year 5. By year 5, there will be a significant amount of data and analysis available to disseminate. This is the ideal time to start sharing this information with relevant stakeholders, such as policymakers, public health officials, and veterinarians. Ending Year 7 sufficient time will be provided to develop and disseminate a variety of communication products, such as reports, infographics, and presentations. It should also allow for outreach to different stakeholder groups and for engagement with the media.

Programme 2.9: National Strategy for Prevention and Control of Rabies

476. Establishing a nationwide rabies surveillance network should start in year 1 to allow sufficient time to identify and engage with relevant partners, develop standardized protocols, and establish communication channels. A well-established surveillance network is crucial for tracking rabies cases, identifying areas of high incidence, and informing prevention and control efforts.

477. Developing standardized reporting forms should start in year 2 to build on the established surveillance network and ensure that data is collected in a consistent and reportable format. Standardized reporting forms facilitate data collection, analysis, and comparison across different regions.

478. Utilizing electronic data management systems should start in year 3 to leverage technology for efficient data storage, analysis, and sharing. Electronic data management systems allow for quick access to data, facilitate trend identification, and enable collaboration among stakeholders.

479. Conducting regular data analysis (ongoing) should start in year 4 and should be ongoing throughout the 10-year strategy to allow for the accumulation of sufficient data for meaningful analysis and trend identification. Regular data analysis helps identify patterns, assess the effectiveness of prevention and control measures, and guide resource allocation.

480. Disseminating surveillance data (ongoing) should start in year 5 and should be ongoing throughout the 10-year strategy to ensure that stakeholders have access to up-to-date information for informed decision-making. Dissemination of surveillance data promotes transparency, fosters collaboration, and enables evidence-based decision-making.

481. Developing a comprehensive vaccination plan should start in year 1 to identify priority areas, target populations, and resource requirements for effective vaccination campaigns. A comprehensive

plan ensures that vaccination efforts are focused on areas with the highest need and maximizes their impact.

482. Ensuring the availability of high-quality rabies vaccines should start in year 2 to secure procurement contracts, establish storage facilities, and maintain vaccine quality control measures. Access to high-quality vaccines is essential for effective vaccination campaigns and ensuring animal protection.

483. Mobilizing veterinary teams and community volunteers should start in year 3 to recruit, train, and coordinate personnel for efficient and effective vaccination campaigns. A trained and coordinated workforce is crucial for administering vaccines accurately and reaching a wide range of animals.

484. Implementing incentives and outreach programs should start in year 4 to increase animal owner participation and promote vaccine uptake. Incentives and outreach programs can address vaccine hesitancy and encourage broader participation in vaccination campaigns.

485. Monitoring vaccination campaign effectiveness should start in year 5 and should be ongoing throughout the 10-year strategy to track vaccination coverage, assess serological responses, and evaluate the impact on disease incidence. Monitoring vaccination campaign effectiveness allows for adjustments to strategies and ensures that resources are used efficiently.

486. Developing targeted educational materials should start in year 1 to tailor messages and formats to specific audiences, ensuring clarity and cultural sensitivity. Tailored educational materials ensure that information is accessible, understandable, and relevant to different communities.

487. Utilizing diverse communication channels should start in Year 2 to reach a wider range of audiences, including those with limited access to traditional media. Utilizing diverse communication channels ensures that rabies prevention messages reach a broader audience, including marginalized communities.

488. Conducting workshops and training programs should start in year 3 to provide hands-on learning opportunities for animal owners and community members. Workshops and training programs empower individuals to take action and promote rabies prevention practices within their communities.

489. Engaging with community leaders and religious organizations should start in year 4 to leverage existing networks and promote rabies prevention within communities. Engaging with community leaders and religious organizations can amplify rabies prevention messages and reach a wider audience through trusted channels.

490. Collaborating with schools and educational institutions should start in Year 5 and should be ongoing throughout the 10-year strategy to integrate rabies prevention education into curricula, reaching future generations. Collaboration with schools and educational institutions ensures that rabies prevention is integrated into the education system and reaches future generations.

491. Implementing effective stray animal management programs should start in year 1 to address the issue of stray animals, which can act as reservoirs of rabies transmission.

492. Enforcing animal registration and vaccination requirements should start in year 2 to establish a system for tracking animal ownership and vaccination status.

493. Collaboration with local authorities on animal importation and movement regulations should start in year 3 to prevent the introduction of rabies from neighboring areas.

494. Establishing animal shelters and foster care programs should start in year 4 to provide temporary housing for stray or abandoned animals, reducing their presence on the streets.

495. Conducting regular inspections of animal shelters and breeding facilities should start in year 5 to ensure adherence to animal welfare standards and prevent the spread of rabies within these facilities.

496. Supporting research on rabies epidemiology and transmission dynamics should start in year 1 by conducting a comprehensive literature review to identify gaps in knowledge and prioritize research areas. Establishing a research advisory board to provide guidance and expertise. By year 5 research projects focusing on should be conducted, collaboration with research institutions and universities should be established and dissemination of research findings through publications, conferences, and workshops should be effective.

497. Encouraging collaboration between researchers should start in year 2 by organizing workshops and conferences to bring together researchers from different disciplines and institutions; and facilitating networking opportunities and knowledge exchange. By year 6: research networks and collaborative platforms to promote joint research projects and data sharing should be established. The development of standardized research protocols and data collection methods should be supported and the creation of shared research databases and analytical tools facilitated.

498. Conducting studies to identify risk factors for rabies transmission and evaluate the effectiveness of prevention and control strategies should start in year 3. This is the year after the initial research prioritization and funding allocation (Year 1-2). By Year 3, researchers will have a clearer understanding of the research landscape and can begin designing and implementing studies to identify risk factors and evaluate prevention strategies. By year 7 a reasonable timeframe would be allocated to conduct field studies, collect data, analyze results, and disseminate findings.

499. Developing innovative approaches to rabies prevention, such as oral vaccination campaigns should start in year 4. This is the year after the research on risk factors and prevention effectiveness has begun (Year 3-4). By Year 4, researchers will have a better understanding of the gaps in current prevention methods and could start exploring innovative approaches. By year 8, sufficient time would have been allocated to conceptualize, develop, and pilot test innovative prevention approaches.

500. Promoting the development of new diagnostic tools and technologies to facilitate early detection and rapid response to rabies outbreaks should start in year 5. This is the year after the initial research funding allocation (Year 1-2). By year 10, sufficient time would have been allocated for a long-term investment in diagnostic research and development.

Strategic Pillar 3: Prevent, detect and respond to health issues at the interfaces between humans, animals and the environment

Programme 3.1: Quarantine and Movement Control

501. To prevent the rapid spread of diseases, it is vital to establish or upgrade facilities that can effectively quarantine and isolate animals. Allocating a significant portion of the budget, say $3 million,

towards this strategy will ensure the availability of state-of-the-art facilities equipped with the necessary technologies and infrastructure. In the first year of the ten-year strategy, it is crucial to start the process of building or upgrading existing facilities that can effectively quarantine and isolate animals.

502. To instill effective quarantine protocols and control measures, investing in comprehensive training programs for veterinarians, animal health professionals, and relevant stakeholders is crucial. Allocating $2 million towards these programs will equip professionals with the necessary knowledge and skills to prevent, detect, and control diseases. In the second year of the strategy, comprehensive training programs should be implemented for veterinarians, animal health professionals, and relevant stakeholders. By the end of the second year, a comprehensive training program should have been completed, ensuring that veterinarians, animal health professionals, and relevant stakeholders are well-prepared to handle quarantine protocols, disease prevention, and control measures effectively.

503. Educating livestock keepers, farmers, traders, and the general public about the importance of quarantine and movement control measures is essential to ensure their cooperation. Allocating $1 million towards public awareness campaigns will help disseminate information on disease prevention and control. In the fourth year of the strategy, it is crucial to conduct public awareness campaigns to educate livestock keepers, farmers, traders, and the general public about the importance of quarantine and movement control measures. By the end of the fourth year, comprehensive public awareness campaigns should have been successfully executed, resulting in increased knowledge and understanding among livestock keepers, farmers, traders, and the general public about the importance of quarantine and movement control measures.

504. To strengthen animal health and quarantine measures, it is imperative to review and update existing laws and regulations. Allocating $1.5 million towards this strategy will enable the implementation of robust legal frameworks that align with global best practices. In the sixth year of the strategy, it is crucial to review and update existing laws and regulations related to animal health, quarantine, and movement control. This activity ensures that the legal framework is aligned with the latest scientific advancements and best practices in disease prevention and control. By the end of the sixth year, the review and update of existing laws and regulations related to animal health, quarantine, and movement control should be completed, facilitating a more effective legal framework for disease prevention and control.

505. Efficient coordination and collaboration among various entities involved in animal health are vital for successful disease prevention. Allocating $1.5 million towards facilitating coordination will promote the exchange of information, resources, and expertise. In the eighth year of the strategy, it is crucial to facilitate coordination and collaboration among various entities involved in animal health. This activity aims to ensure a holistic and integrated approach to disease prevention and control. Regular meetings, workshops, and conferences should be organized to promote collaboration, exchange of knowledge, and coordination of efforts. By the end of the eighth year, a well-established network of coordination and collaboration among various entities involved in animal health should be in place, enabling a more efficient and effective approach to disease prevention and control.

506. Recognizing the importance of global cooperation, allocating $1 million towards seeking international support and collaboration will enhance infrastructure and resources for disease control

measures. Collaborating with international organizations such as the World Health Organization (WHO) and OIE will enable access to global expertise and funding opportunities. In the final year of the strategy, it is crucial to seek international support and collaboration to improve infrastructure and resources for control measures. This activity aims to leverage international expertise and resources to enhance disease prevention and control capabilities. By the end of the ten-year strategy, international support and collaboration should have been successfully sought, resulting in improved infrastructure and resources for disease control measures.

Programme 3.2: Standards for Veterinary Facilities and Equipment

507. To ensure a steady supply of quality vaccines for priority diseases, a significant portion of the budget, USD 1.5 million, should be allocated to vaccine procurement and research. By partnering with reputable vaccine manufacturers or international organizations, we can mitigate the risk of vaccine shortages. These partnerships would enable us to access cost-effective vaccines and leverage their expertise to develop more effective and targeted vaccines for priority diseases. Additionally, a portion of this allocation should be dedicated to establishing a robust surveillance system to monitor vaccine efficacy and safety. This collaboration should commence in the first year of the ten-year strategy.

508. To enhance the infrastructure supporting animal health, such as cold chain facilities, USD 1 million should be allocated. This investment would ensure the proper storage and transportation of vaccines, maintaining their potency and effectiveness. Upgrading existing cold chain facilities and establishing new ones in underserved areas would improve accessibility to vaccines, especially in remote regions. The process of enhancing infrastructure should commence in the second year of the strategy. This allows enough time for thorough planning, resource allocation, and construction of cold chain facilities. By the fifth year, these facilities should be fully operational and compliant with international standards. Continuous maintenance and upgrade of infrastructure should be carried out throughout the ten-year period to ensure sustained efficiency.

509. To strengthen vaccine supply chains and prevent shortages, allocating USD 750,000 to establishing partnerships with reputable vaccine manufacturers and international organizations is essential. These partnerships would facilitate the exchange of knowledge, expertise, and resources, ensuring a sustainable and uninterrupted supply of vaccines. Collaborative efforts can also lead to the development of joint research projects, paving the way for innovative approaches to disease prevention and control. Establishing partnerships with reputable vaccine manufacturers or international organizations to avoid vaccine shortages should commence in the first year of the strategy. Constant communication and periodic evaluations should be conducted throughout the ten-year period to maintain effective partnerships and promptly address any potential issues.

510. Allocating USD 500,000 to foster collaboration between national and regional animal health agencies, research institutes, and international organizations is crucial for sharing knowledge, expertise, and resources. These collaborations would enable the prioritization and eradication of animal diseases through vaccination. Joint research initiatives, information sharing platforms, and capacity-building programs will bolster the collective efforts to combat diseases, maximize efficiency, and minimize duplication of resources. This collaboration should begin in the first year of the strategy and continue throughout the entire ten-year period. Regular meetings, workshops, and conferences

should be organized to facilitate the exchange of information, research findings, and best practices. Mutual support and joint efforts are vital to prioritize and eradicate animal diseases through vaccination.

511. Effective public awareness campaigns are crucial for educating livestock owners, farmers, and animal handlers about the importance of vaccination, disease prevention, and early detection. Allocating USD 500,000 to this initiative would allow for the development of educational materials, training programs, and awareness campaigns targeting various stakeholders. Utilizing media platforms, community outreach programs, and collaborations with local organizations, we can disseminate vital information on best practices in animal health, thereby empowering individuals to actively participate in disease prevention and control. These campaigns should begin in the third year of the strategy, following the establishment of a steady vaccine supply and improved infrastructure. The campaigns should be targeted, engaging, and accessible to all stakeholders involved in the livestock industry. The duration of these campaigns should span the entire ten-year period, with regular intervals for assessment and adjustment to address emerging challenges and changing demographics.

512. To enhance the skills and knowledge of veterinarians and animal health workers, USD 750,000 should be allocated to comprehensive training programs. These programs would cover vaccination techniques, disease diagnosis, surveillance, and reporting. By investing in training, we can ensure the effective implementation of vaccination campaigns, accurate disease diagnosis, and timely reporting, ultimately strengthening the overall animal health infrastructure. These programs should commence in the second year of the strategy, following the establishment of improved animal health infrastructure. The training should cover a wide range of topics, including vaccination protocols, disease identification, data collection, and reporting standards. Continuous professional development opportunities should be provided throughout the ten-year period to ensure the acquisition of updated knowledge and skills.

Programme 3.3: Biosecurity measures for disease prevention and control

513. The first item in this Programme is to establish a reporting system for timely communication of disease outbreaks and relevant information. This component lays the foundation for effective disease surveillance and response. To ensure its efficiency, approximately USD 1 million should be allocated towards developing a robust reporting system. This includes the establishment of digital platforms, training personnel, and strengthening communication networks. This system should involve the collaboration of veterinary authorities, laboratories, and other relevant stakeholders. In Year one, the groundwork for this reporting system should be laid, including the development of standardized reporting formats and protocols. By Year two, the system should be fully operational, enabling efficient and rapid information exchange.

514. Implementing strict quarantine measures for imported animals, animal products, and equipment is crucial in preventing the introduction and spread of diseases. Allocating USD 1.5 million towards this component will allow for the enhancement of quarantine facilities, staff training, and the development of advanced diagnostic tools. Additionally, a portion of this budget should be dedicated to public awareness campaigns to emphasize the importance of complying with quarantine regulations. This

activity should commence in Year one with the development of comprehensive quarantine guidelines and the establishment of quarantine facilities. By Year three, these measures should be fully implemented, incorporating robust inspection protocols, staff training, and adequate resources to ensure effective quarantine procedures.

515. For effective disease control, it is vital to establish clear regulations and biosecurity standards within the animal health sector. Allocating USD 1 million towards this component will facilitate the development and enforcement of comprehensive regulations, the establishment of inspection and certification systems, and the provision of technical support to stakeholders. This investment will help build a solid foundation for the overall biosecurity infrastructure. In Year two, a dedicated task force should be established to develop comprehensive regulations and standards, taking into account international best practices and scientific evidence. By Year five, these regulations and standards should be enforced, with regular audits and inspections to ensure compliance within the animal health sector.

516. The establishment of an animal identification and traceability system is crucial for tracking and monitoring the movement of animals. Allocating USD 1.5 million towards this component will enable the implementation of modern identification technologies, such as electronic ear tags and RFID systems. Additionally, funds will be dedicated to training stakeholders on the utilization of the system and developing a centralized database for effective data management. In Year three, the development of a robust system, encompassing both electronic identification and physical tagging, should be initiated. By Year six, this system should be fully implemented, enabling accurate tracking and monitoring of animal movements, facilitating prompt response to disease outbreaks, and supporting trade-related requirements.

517. To enhance disease surveillance, response, and coordination, fostering collaboration between different agencies, both national and international, is imperative. Allocating USD 1.5 million towards this component will facilitate the establishment of joint task forces, the sharing of information and resources, and the organization of collaborative research projects. These efforts will enhance the capacity to detect and respond to disease outbreaks promptly. In Year four, efforts should begin to establish partnerships and solidify cooperation frameworks between national and international agencies involved in animal health. This collaboration should be an ongoing process throughout the ten-year strategy, with regular meetings, joint exercises, and information sharing to enhance collective efforts in disease management.

518. Public awareness campaigns play a vital role in educating the general public about the importance of biosecurity in disease prevention and control. Allocating USD 500,000 towards this component will allow for the development and dissemination of educational materials, organizing workshops and seminars, and utilizing social media platforms to reach a wider audience. Emphasizing individual responsibility in maintaining biosecurity measures will foster a culture of awareness and compliance. In Year five, public awareness campaigns should be launched, utilizing various communication channels to disseminate information about biosecurity measures, disease risks, and the role of individual responsibility. These campaigns should continue until Year seven, with periodic evaluations to ensure their effectiveness in educating the general public.

519. Training programs for farmers, veterinarians, and other stakeholders are essential for raising awareness about biosecurity measures and best practices. Allocating USD 1 million towards this component will enable the development and implementation of comprehensive training modules, the provision of hands-on workshops, and the establishment of training centers. These programs will enhance the capacity of stakeholders to implement effective biosecurity measures. In Year six, comprehensive training programs should be initiated, focusing on biosecurity measures, disease recognition, and best practices. These programs should continue throughout the ten-year strategy, incorporating regular updates and evaluations to ensure their relevance and impact.

Programme 3.4: Early Warning Systems

520. Regular reporting, data collection, analysis, and the establishment of effective early warning systems are fundamental for identifying potential threats promptly. Allocating a significant portion of the budget, approximately USD 3 million, to this aspect will enable the implementation of robust surveillance mechanisms, ensuring that accurate and timely information is available to stakeholders. This investment will facilitate proactive decision-making and efficient resource allocation. To establish a strong foundation for effective disease management, the first three years of the strategy will focus on regular reporting, data collection, analysis, and the establishment of early warning systems. This will involve the development and implementation of standardized reporting mechanisms across all relevant stakeholders, including veterinary professionals, livestock farmers, and other relevant parties. Data collection will be carried out through surveys, on-farm assessments, and laboratory testing. The collected data will be analyzed using statistical techniques to identify trends, patterns, and potential threats. Concurrently, early warning systems will be established to promptly detect and alert authorities of any emerging livestock disease threats, enabling timely interventions.

521. The establishment of a robust disease surveillance system is crucial for monitoring livestock diseases across different regions. A budget of USD 2 million should be allocated to this component to enable the deployment of advanced technology and personnel training. This investment will enhance disease detection capabilities, enable rapid response, and prevent outbreaks from spreading, ultimately safeguarding the health of livestock and minimizing economic losses. After establishing the foundation for data collection and analysis, years three to five will be dedicated to the establishment of a robust disease surveillance system. This system will monitor livestock diseases in different regions, including the collection of data on livestock populations, animal movements, and disease prevalence. By utilizing advanced techniques such as remote sensing, geographic information systems (GIS), and real-time data collection, authorities will be able to track disease outbreaks, identify high-risk areas, and implement targeted interventions.

522. Gathering comprehensive data on livestock populations, animal movements, and disease prevalence is essential for informed decision-making. Allocating approximately USD 2.5 million to this component will facilitate the collection of accurate and up-to-date information, enabling policymakers to identify disease hotspots, implement targeted interventions, and allocate resources effectively.

523. To ensure effective disease identification, reporting, and data collection techniques, training and workshops are imperative. Allocating USD 1.5 million to this component will enable the provision of comprehensive training programs for veterinary professionals, livestock farmers, and relevant

stakeholders. This investment will enhance their knowledge and skills, leading to improved disease surveillance and control measures. Concurrent with the establishment of the disease surveillance system, years four to six will focus on providing training and workshops for veterinary professionals, livestock farmers, and relevant stakeholders. These training programs will aim to enhance disease identification, reporting, and data collection techniques. By equipping individuals with the necessary skills and knowledge, the strategy will strengthen the overall capacity of the livestock industry to effectively manage diseases and promptly report any potential threats.

524. Developing a comprehensive database or information management system is vital for storing and managing collected data efficiently. Allocating USD 2 million to this component will facilitate the implementation of a secure and user-friendly system. This investment will streamline data access, enable data sharing between stakeholders, and support evidence-based decision-making, ultimately enhancing disease management strategies. To efficiently store and manage the collected data, years five to seven will be dedicated to the development of a comprehensive database or information management system. This database will ensure easy access, retrieval, and analysis of the collected data, facilitating evidence-based decision-making and targeted interventions. Emphasis will be placed on data security, privacy, and compatibility across different platforms to ensure seamless integration with existing systems.

525. Applying appropriate statistical and epidemiological techniques to analyze and interpret collected data is crucial for effective disease control. Allocating USD 1 million to this component will enable the employment of skilled professionals and the utilization of advanced analytical tools. This investment will provide valuable insights, facilitate evidence-based decision-making, and enhance the overall effectiveness of disease management efforts. In years six to eight, the strategy will focus on the utilization of appropriate statistical and epidemiological techniques to analyze and interpret the collected data. This analysis will provide valuable insights into disease trends, risk factors, and potential interventions. Advanced statistical models and predictive analytics will be employed to forecast disease outbreaks, enabling proactive measures to prevent their spread.

526. Developing and regularly updating emergency response plans, protocols, and standard operating procedures are critical for handling various animal health emergencies. Allocating USD 1.5 million to this component will ensure the establishment of robust emergency response mechanisms. Additionally, maintaining strategic reserves of veterinary drugs, vaccines, and necessary equipment with a budget of USD 1.5 million will enable prompt and effective intervention during outbreaks, minimizing their impact on livestock health and the agricultural sector. Years eight to ten, will be dedicated to the development and regular updates of emergency response plans, protocols, and standard operating procedures (SOPs). These plans will outline the specific actions to be taken during various animal health emergencies, ensuring a coordinated and efficient response. Additionally, strategic reserves of veterinary drugs, vaccines, and necessary equipment will be maintained to enable prompt and effective interventions.

527. Equipping and strengthening veterinary laboratories is imperative for enhancing diagnostic capabilities. Allocating USD 1 million to this component will enable the procurement of advanced laboratory equipment and the training of laboratory personnel. This investment will enhance disease detection and speed up the diagnosis process, enabling timely response and appropriate control

measures. Concurrently with emergency response planning, years eight to ten will also focus on enhancing diagnostic capabilities by equipping and strengthening veterinary laboratories. This will involve providing state-of-the-art laboratory equipment, advanced diagnostic techniques, and training for laboratory personnel. Strengthening diagnostic capabilities will enable prompt and accurate disease identification, facilitating targeted interventions and minimizing the spread of diseases.

Programme 3.5: Epidemiological Investigations

528. A robust surveillance system is essential for the accurate and timely detection of animal diseases. This strategy involves the use of advanced technologies, such as real-time monitoring, diagnostic tools, and data analysis. Approximately USD 1 million should be allocated to developing and maintaining this system, which includes the procurement of equipment, training for personnel, and establishing a network of veterinary laboratories. The first activity of this ten-year strategy is to establish a robust surveillance system that accurately and timely detects animal diseases. In the initial years, focus should be on building partnerships with veterinary services, government agencies, research institutions, and international organizations. This collaboration will ensure the availability of necessary resources, expertise, and data sharing mechanisms for a comprehensive surveillance system.

529. Effective collaboration and coordination among stakeholders are imperative for successful disease surveillance and control. To promote cooperation among government agencies, veterinary services, research institutions, and international organizations, around USD 500,000 should be allocated. This budget would be utilized for organizing conferences, workshops, and joint research projects, as well as fostering partnerships with global entities. To foster collaboration and coordination among stakeholders, continuous efforts should be made throughout the ten-year strategy. Regular meetings, workshops, and conferences should be organized to facilitate knowledge exchange, align goals, and identify common challenges. Government agencies, veterinary services, research institutions, and international organizations must work together to establish a strong network that can effectively respond to disease outbreaks.

530. To ensure compliance with animal health regulations, it is vital to allocate USD 500,000 towards the development and enforcement of appropriate legislation. This budget will support the engagement of legal experts, policy formulation, and public awareness campaigns regarding disease reporting, import/export regulations, and vaccination programs. Developing and enforcing appropriate legislation and policies related to animal health is a critical step in disease surveillance and control. In the first five years of the strategy, efforts should be made to research and draft legislation that addresses disease reporting, import/export regulations, vaccination programs, and animal health standards. These policies should be regularly reviewed and revised to reflect new scientific knowledge and evolving disease patterns.

531. Raising awareness about the importance of reporting animal diseases, practicing biosecurity measures, and following veterinary guidelines is essential. Allocating USD 300,000 for educational campaigns, workshops, and training programs will help reach livestock owners, farmers, and the general public. This budget will cover the production of informational materials, public service announcements, and training sessions conducted by veterinary authorities. Raising awareness among livestock owners, farmers, and the general public is essential for effective disease reporting and

biosecurity measures. This activity should be ongoing throughout the ten-year strategy, with targeted campaigns, workshops, and educational programs. Collaboration with veterinary authorities and agricultural extension services can ensure the dissemination of accurate information and guidelines to prevent the spread of diseases.

532. Promoting the One Health approach, which recognizes the interconnection between animal, human, and environmental health, is crucial for preventing and controlling diseases. Approximately USD 200,000 should be allocated to developing policies and regulations that support the implementation of One Health activities. This budget will cover consultations with experts, research initiatives, and the facilitation of inter-sectoral collaborations. One Health activities, which recognize the interconnection between animal, human, and environmental health, are crucial for comprehensive disease surveillance and control. Policymakers should focus on developing policies and regulations that support the implementation of One Health activities. This will require engagement with various stakeholders and a multidisciplinary approach to address the complex nature of disease transmission.

533. A centralized database is critical for collecting, storing, and analyzing animal health data. Allocating USD 500,000 for this purpose will enable the procurement of necessary hardware and software, as well as the training of personnel in data management and analysis techniques. A centralized database for collecting, storing, and analyzing animal health data is essential for effective surveillance. In the middle years of the strategy, efforts should be made to develop and implement a robust database system. This will require collaboration with IT experts, data management professionals, and stakeholders to ensure data accuracy, privacy, and accessibility.

534. To effectively respond to disease outbreaks, a comprehensive emergency response plan is necessary. Allocating USD 300,000 towards the creation of such a plan will cover the development of protocols, training programs, and the establishment of a rapid response team equipped to handle emergencies. Creating an emergency response plan is crucial to swiftly address disease outbreaks. This activity should be prioritized in the later years of the strategy to build upon the foundation of surveillance, collaboration, and database development. The plan should include clear protocols, communication channels, and resource allocation strategies to ensure a coordinated response during emergencies.

535. Research plays a vital role in disease surveillance, diagnostics, and preventive measures. Allocating USD 500,000 for research initiatives will support studies on disease surveillance techniques, diagnostic tools, and preventive measures. This budget will also facilitate collaboration with research institutions and the publication of scientific findings.

536. Collaborating with organizations such as the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization (FAO) is key to benefitting from their expertise, resources, and experiences. Allocating USD 200,000 for engagement with these organizations will cover membership fees, participation in conferences, and the establishment of partnerships for knowledge sharing. To foster this collaboration, efforts should begin in the fifth year of the strategy. This will allow for the establishment of partnerships, the development of joint initiatives, and the coordination of activities. Throughout the remaining years of the strategy, ongoing collaboration and coordination should be prioritized to ensure sustained efforts and harmonized approaches.

537. Training programs are crucial for building capacity among veterinarians, animal health professionals, and relevant stakeholders. Allocating USD 500,000 towards training initiatives will cover the development of specialized courses, workshops, and the provision of scholarships for advanced training. This budget will also support the engagement of expert trainers and the establishment of training centers. In our ten-year strategy, such training programs should ideally commence in the first year to lay the foundation for subsequent activities. Continual training and updates within this field should continue throughout the entire ten-year period to keep professionals up-to-date with the latest developments and techniques.

538. Research initiatives play a pivotal role in understanding the complex links between animal health, human health, and environmental factors. To promote such initiatives, approximately 20% of the budget, or USD 600,000, should be allocated. This funding can support studies exploring the emergence of zoonotic diseases, the impact of environmental degradation on animal health, and the development of innovative solutions for disease prevention. By encouraging research, we can generate crucial knowledge and evidence to inform policy-making and improve global health outcomes. Research initiatives for disease surveillance, diagnostics, and preventive measures should be ongoing throughout the ten-year strategy. Collaboration with research institutions, funding agencies, and international organizations will facilitate the development of innovative approaches, technologies, and vaccines to enhance disease surveillance and control.

539. Engaging local communities, livestock owners, farmers, and relevant stakeholders is essential for successful One Health activities. Allocating USD 750,000, will allow for the development of community-centered programs. These initiatives can include awareness campaigns, training workshops, and the establishment of community-based surveillance systems. By empowering local communities and stakeholders, we can promote ownership, enhance knowledge sharing, and ensure the sustainability of One Health interventions. Community engagement should ideally begin in the third year to allow for adequate planning and preparation. Throughout the ten-year period, regular engagement should be maintained, ensuring sustained involvement and collaboration. Continuous engagement throughout the ten-year strategy will enable the exchange of knowledge, best practices, and capacity-building initiatives.

540. Regular risk assessments are vital for identifying potential disease threats and evaluating their potential impact on animal health and the livestock industry. Allocating USD 450,000, to this area will enable the establishment of robust surveillance systems, laboratory infrastructure, and data analysis capabilities. By investing in risk assessments, we can proactively detect and respond to emerging diseases, preventing outbreaks and safeguarding both animal and human health. These assessments should commence in the fourth year of the strategy. By conducting periodic evaluations, potential threats can be identified and appropriate preventive measures can be implemented. Continual assessments throughout the ten-year period will facilitate proactive measures and adaptive strategies.

541. To address shared health concerns effectively, fostering collaboration and coordination among various sectors is crucial. Allocating USD 600,000, will enable the establishment of collaborative platforms, such as interdisciplinary workshops and conferences, where professionals from animal health, human health, and environmental sectors can exchange knowledge, share best practices, and

develop joint action plans. By promoting collaboration, we can harness the collective expertise of different sectors and implement holistic approaches to health challenges.

542. Enhancing the capacity of healthcare professionals, veterinarians, and relevant stakeholders is imperative for successful One Health implementation. Allocating 20% of the budget, or USD 600,000, to training programs will facilitate the development and delivery of comprehensive courses on One Health principles, zoonotic disease surveillance, outbreak response, and integrated disease control. By investing in training, we can equip professionals with the knowledge and skills needed to address emerging health threats effectively. These programs should ideally commence in the sixth year of the strategy, allowing for the dissemination of comprehensive knowledge. Throughout the ten-year period, regular training programs should be conducted to ensure continuous development and capacity building.

Programme 3.6: Promoting public awareness about the importance of animal health

543. The first strategy involves the development of educational materials such as brochures, pamphlets, posters, and guidelines. Proper allocation of funds should prioritize the creation of high-quality, visually appealing materials that effectively communicate important information on animal health practices, vaccination schedules, disease prevention measures, and treatment protocols. Approximately USD 300,000, can be allocated to this strategy, considering the costs of design, printing, and distribution. The development and review of these materials should occur within the first two years of the strategy.

544. Training sessions and workshops play a crucial role in disseminating knowledge to livestock farmers and community animal health workers. To ensure comprehensive coverage, an allocation of 25% of the budget, or USD 500,000, should be dedicated to organizing these events. This amount will cover expenses related to venue rental, resource persons, training materials, and logistics. Training sessions, workshops, and seminars for livestock farmers and community animal health workers will be organized in years three and four.

545. Active community engagement is essential for the success of any animal health initiative. Allocating USD 200,000, to organizing interactive sessions, participatory workshops, and dialogue forums will enable meaningful engagement with the community. These events should be designed to understand community perceptions, concerns, and suggestions related to animal health, fostering a sense of ownership and collaboration. To ensure community involvement and active participation, interactive sessions, participatory workshops, and dialogue forums will be organized in years five and six.

546. To ensure the effectiveness of educational materials, campaigns, and training programs, a system for monitoring and evaluation must be established. Allocating 5% of the budget, or USD 100,000, for this purpose will allow for the development of effective measurement tools, data collection, and analysis. Investing in this strategy will enable the identification of gaps and areas for improvement, ensuring that resources are optimally utilized. This system should be designed in years five to seven, incorporating key performance indicators and evaluation tools. Regular assessments should be conducted to measure the impact of the strategy, identify areas for improvement, and ensure the allocation of resources in the most effective manner.

547. Local veterinarians are vital in ensuring the well-being of livestock and overall animal health. Approximately USD 400,000, should be allocated to conducting workshops, seminars, and training sessions specifically designed to enhance their knowledge and skills. This investment will contribute to strengthening their abilities to diagnose, treat, and prevent diseases, ultimately benefiting the communities they serve. In years seven and eight, workshops, seminars, and training sessions will be organized specifically for local veterinarians.

548. To maximize the impact of animal health initiatives, partnerships between local veterinarians and private businesses, such as livestock farmers, agribusinesses, or pharmaceutical companies, should be fostered. Allocating USD 200,000, to this strategy will facilitate collaboration, knowledge sharing, and collective problem-solving. Advocating for policies that prioritize animal health and support local veterinarians is crucial. Advocating for the development and implementation of policies that prioritize animal health and support local veterinarians will be a key focus during this period. To foster collaboration and knowledge sharing among local veterinarians, community-based networks will be established in years eight and nine.

549. To ensure the success of animal health initiatives, it is imperative to engage with policymakers from the onset. This process should commence in the first year and continue throughout the ten-year strategy. By establishing strong relationships with policymakers, animal health initiatives can receive adequate funding, resources, and recognition. This engagement will involve regular meetings, discussions, and advocacy efforts to emphasize the importance of animal health and secure necessary support. Dedicate USD 100,000, to engage with policymakers and ensure adequate funding, resources, and recognition for animal health initiatives. In the final years of the strategy, partnerships between local veterinarians and private businesses, such as livestock farmers, agribusinesses, or pharmaceutical companies, will be fostered. These partnerships will enable the exchange of knowledge, resources, and expertise, contributing to improved animal health outcomes.

550. To maintain a high standard of veterinary care, continuous professional development opportunities should be established. Allocating USD 100,000, will enable the organization to organize conferences, seminars, and workshops where local veterinarians can update their knowledge and skills. This investment will contribute to ensuring the long-term sustainability and effectiveness of animal health initiatives. This activity should commence in the second year and continue throughout the strategy. Systems will be established to provide veterinarians with opportunities for continuous learning, including conferences, workshops, and webinars.

551. Allocating USD 100,000, to organize awareness events in local communities, including seminars, exhibitions, and interactive sessions, will raise awareness about animal health and promote community involvement. These events can serve as platforms to disseminate information, engage the public, and showcase best practices. These events will commence in the third year and continue throughout the strategy. Through engaging presentations and interactive sessions, community members will have the opportunity to learn about animal health practices, vaccination schedules, disease prevention, and treatment protocols.

552. A significant portion of the budget, $200,000, should be allocated towards the development of educational materials. This investment will allow for the creation of high-quality brochures, pamphlets, posters, and guidelines that provide valuable information on animal health practices,

vaccination schedules, disease prevention measures, and treatment protocols. These materials will serve as valuable resources for livestock farmers and community animal health workers, enhancing their knowledge and improving animal health practices. In the fourth year of the strategy, the development of brochures, pamphlets, posters, and guidelines will commence. Continuous updates and improvements will be made based on evolving research.

553. To ensure the effective dissemination of knowledge, $150,000 should be allocated towards organizing training sessions, workshops, and seminars for livestock farmers and community animal health workers. These sessions will facilitate hands-on learning experiences and provide a platform for the exchange of ideas, best practices, and the latest advancements in animal health. By empowering individuals with up-to-date information, this investment will play a crucial role in improving animal healthcare practices at the grassroots level. These sessions will commence in the fifth year and continue throughout the strategy. By equipping farmers and health workers with the necessary knowledge and skills, animal health practices can be improved at the grassroots level. Topics covered will include animal husbandry, disease prevention, treatment protocols, and biosecurity measures.

554. Community engagement is vital for the success of any animal health strategy. Allocating $100,000 towards organizing interactive sessions, participatory workshops, and dialogue forums will encourage open discussions, enabling a better understanding of community perceptions, concerns, and suggestions related to animal health. This investment will foster a sense of ownership, empowering communities to actively participate in animal healthcare initiatives. Interactive sessions, participatory workshops, and dialogue forums will be organized starting from the sixth year. These activities will encourage open discussions to understand community perceptions, concerns, and suggestions related to animal health.

555. Allocating $150,000 towards establishing a robust monitoring and evaluation system is essential to gauge the effectiveness of educational materials, campaigns, and training programs. This investment will allow for the collection of data on knowledge uptake, behavioral changes, and overall impact on animal health outcomes. By regularly assessing the effectiveness of initiatives, necessary adjustments can be made to ensure continuous improvement and maximum impact. To ensure the effectiveness of educational materials, campaigns, and training programs, monitoring and evaluation systems will be established in the seventh year of the strategy. These systems will assess the impact of various initiatives and identify areas for improvement. By collecting data and feedback, adjustments can be made to optimize the outcomes and ensure the long-term success of animal health initiatives.

556. Creating a user-friendly and informative website with an allocation of $100,000 will serve as a central hub for educational resources, news updates, and community engagement. This online platform will enhance accessibility to educational materials, provide a forum for discussions, and disseminate timely information to a wider audience. Additionally, the website can act as an essential resource for farmers, veterinary professionals, and researchers seeking valuable information on animal health practices. This website will be created starting from the eighth year and continue throughout the strategy. It will provide a centralized platform for access to educational materials, interactive forums, and the latest developments in the field of animal health.

557. To cater to the increasing need for virtual education, allocating $50,000 towards conducting webinars and online workshops on relevant topics of interest to the animal health sector is imperative.

This investment will allow for the dissemination of knowledge to a broader audience, transcending geographical barriers. Online workshops will provide an interactive learning experience, fostering engagement and knowledge sharing among participants. To reach a wider audience and overcome geographical barriers, webinars and online workshops will be conducted starting from the ninth year. These virtual platforms will cover relevant topics of interest to the animal health sector.

558. Lastly, allocating $150,000 towards fostering partnerships in the field of animal health is crucial. Collaborating with organizations, research institutions, and industry stakeholders will promote knowledge exchange, resource sharing, and innovation. Partnerships will enable the implementation of comprehensive and sustainable animal health initiatives, leveraging the expertise and resources of multiple stakeholders. These partnerships will be established in the tenth and final year of the strategy. By collaborating with government agencies, non-profit organizations, research institutions, and industry leaders, resources and expertise can be pooled together to drive meaningful change in animal health practices.

Strategic Pillar 4: Boost emergency readiness for key animal diseases and livestock calamities caused by climate change

Programme 4.1: Disease Notification and Reporting

559. A significant portion of the budget, USD 500,000, should be allocated to developing a comprehensive disease surveillance system. This includes the establishment of early warning mechanisms, training personnel, and creating a network of reporting entities such as veterinarians, farmers, and livestock traders. These elements are crucial for timely detection and response to potential disease outbreaks. The first step in the ten-year strategy is to develop a comprehensive disease surveillance system.

560. Investing USD 300,000 in training programs is imperative for enhancing the knowledge and skills of veterinary professionals and relevant stakeholders. These programs should focus on disease recognition, reporting, and response protocols. By equipping individuals with the necessary expertise, we can ensure accurate and timely reporting, thus facilitating effective disease control measures. By the end of the fourth year, these training programs should be well-established, ensuring that all veterinary professionals and stakeholders are equipped with the necessary expertise.

561. Allocating USD 200,000 to develop a centralized platform or database for disease reporting is essential. This platform will streamline the reporting process, ensuring that all disease reports are submitted promptly and efficiently. It will also enable data sharing and facilitate collaboration among stakeholders, leading to better coordination and more effective responses. By year five, the development of this platform should be completed, allowing for efficient and accurate disease reporting.

562. The allocation of USD 150,000 should be dedicated to regularly analyzing collected disease data. This analysis will help identify patterns, trends, and hotspots, providing valuable insights for targeted interventions. By investing in robust data analysis capabilities, we can enhance our ability to detect and respond to disease outbreaks swiftly and effectively. By allocating years five to eight to this activity,

sufficient time will be provided to collect substantial data and perform comprehensive analysis. This will enable the identification of emerging diseases, implementation of timely interventions, and the formulation of targeted strategies to mitigate disease outbreaks.

563. To ensure continuous improvement, USD 100,000 should be allocated for regularly assessing and evaluating the effectiveness of disease notification and reporting activities. This evaluation will help identify gaps, strengths, and areas of improvement in the surveillance system, enabling evidence-based adjustments and optimization. These assessments will help identify any gaps or shortcomings in the reporting system and allow for timely improvements. By the end of the ninth year, a robust evaluation framework should be established, enabling continuous improvements in disease reporting activities.

564. Effective communication between veterinary authorities, field veterinarians, and stakeholders is crucial for a well-functioning disease surveillance system. Allocating USD 150,000 to establish robust communication channels, such as digital platforms or dedicated hotlines, will enable real-time information exchange, timely reporting, and efficient coordination during outbreaks. Effective communication channels between veterinary authorities, field veterinarians, and stakeholders involved in the animal health sector are crucial for efficient disease reporting. Establishing these channels will involve the development of protocols, guidelines, and the deployment of appropriate technologies. This activity will span throughout the entire ten-year strategy, ensuring seamless communication and collaboration among all stakeholders.

565. Educating animal owners, farmers, and the public about the importance of disease notification and reporting is essential. Allocating USD 200,000 to conduct public awareness campaigns will help foster a culture of reporting and ensure active participation from all stakeholders. By emphasizing the benefits and consequences of reporting, we can enhance compliance and strengthen the overall surveillance system. These campaigns will aim to raise awareness of the potential risks associated with animal diseases and the role of individuals in disease surveillance. Continuous efforts will be made throughout the ten-year strategy to ensure a well-informed and proactive community.

566. To support accurate disease diagnosis and surveillance, USD 500,000 should be allocated to upgrade local veterinary diagnostic laboratories. This includes equipping them with necessary tools and equipment and providing training to staff on proper sample collection, handling, and testing. Improved diagnostic capabilities will enhance disease detection and facilitate prompt responses. . This activity will take place during the later stages of the strategy, allowing sufficient time for the establishment of a robust disease reporting system and the identification of priority areas for laboratory enhancements.

567. Developing and enforcing clear policies, guidelines, and regulations that mandate disease notification and reporting is essential for a robust surveillance system. Allocating USD 300,000 to ensure effective policy implementation will create a regulatory framework that fosters compliance and accountability across the national animal health sector. Clear policies, guidelines, and regulations that mandate disease notification and reporting will be developed and enforced throughout the ten-year strategy. Continuous monitoring and evaluation of these policies will be conducted to ensure their effectiveness and to address any potential challenges.

568. Finally, allocating USD 400,000 to foster collaborations and partnerships with international organizations, neighboring countries, and donors is crucial. These collaborations will facilitate information sharing, resource pooling, and technical expertise exchange. By leveraging external support, we can strengthen our disease notification and reporting systems and enhance our overall preparedness and response capabilities. Throughout the entire ten-year strategy, efforts will be made to foster collaborations and partnerships with international organizations, neighboring countries, and donors. By building strong networks, the national animal health sector will be better equipped to respond to disease outbreaks and implement effective control measures.

Programme 4.2: Contingency planning in animal health

569. Regular reporting, data collection, analysis, and the establishment of effective early warning systems to identify potential threats are crucial for proactive disease control. Allocating USD 2 million to this component will ensure the availability of accurate and up-to-date information, enabling timely response measures. Regular reporting, data collection, analysis, and the establishment of early warning systems should commence in the first year of the ten-year strategy. This activity is essential for monitoring and identifying potential threats to animal health. By analyzing data collected from various sources, such as veterinary clinics, laboratories, and farmers, early warning systems can be established to detect emerging diseases or other threats promptly.

570. Developing and regularly updating emergency response plans, protocols, and standard operating procedures (SOPs) is essential to handle various animal health emergencies effectively. Allocating USD 1.5 million to this item will enable the development of comprehensive and adaptable plans that can be implemented promptly. The development and regular updating of emergency response plans, protocols, and SOPs should begin in the second year of the strategy. These plans and procedures should be comprehensive, covering various animal health emergencies. Regular updates are necessary to incorporate the latest scientific knowledge and lessons learned from previous emergencies.

571. Maintaining strategic reserves of veterinary drugs, vaccines, and necessary equipment is crucial to respond promptly during emergencies. Allocating USD 2.5 million to this component will ensure the availability of essential resources, reducing response time and minimizing the impact of outbreaks. Establishing strategic reserves of veterinary drugs, vaccines, and necessary equipment to respond promptly during emergencies should be initiated in the third year of the strategy. These reserves are essential to ensure the availability of critical resources during animal health crises. Regular monitoring and replenishment should be conducted to maintain an adequate stockpile.

572. Implementing policies and regulations that promote sustainable animal health practices, responsible livestock management, and contingency planning for potential disease outbreaks is vital for long-term prevention and control. Allocating USD 1 million to this item will facilitate the enforcement of regulations and encourage sustainable practices. The implementation of policies and regulations promoting sustainable animal health practices, responsible livestock management, and contingency planning should be initiated in the fourth year of the strategy. These policies and regulations should aim to minimize disease risks, improve biosecurity measures, and foster a culture of preparedness among livestock owners and stakeholders.

573. Developing comprehensive contingency plans that outline steps to be taken during disease outbreaks is essential for efficient response and containment. Allocating USD 1.5 million to this component will enable the creation of detailed plans that consider all possible scenarios. The development of comprehensive contingency plans that outline steps to be taken during disease outbreaks should commence in the fifth year of the strategy. These plans should address various aspects, including surveillance, rapid response, communication protocols, and resource allocation. Regular updates and rehearsals should be conducted to ensure preparedness.

574. Involving local communities, livestock owners, and herders in decision-making processes is crucial for the success and sustainability of contingency plans. Allocating USD 500,000 to this item will ensure the active participation and support of key stakeholders, leading to better implementation and adherence to protocols. The involvement of local communities, livestock owners, and herders in decision-making processes should begin in the sixth year of the strategy. Their participation is vital to ensure the success and sustainability of contingency plans. Engaging stakeholders in the decision-making process fosters ownership and increases the effectiveness of implemented measures.

575. Fostering partnerships to gain support, technical expertise, and resources in response to animal health emergencies is essential for a coordinated and effective response. Allocating USD 1 million to this component will facilitate collaboration with international organizations, research institutions, and other stakeholders. The fostering of partnerships to gain support, technical expertise, and resources in response to animal health emergencies should be initiated in the seventh year of the strategy. Collaborations with national and international stakeholders, including governmental agencies, NGOs, and research institutions, can provide valuable expertise, resources, and financial support during crises.

576. Fostering effective communication and coordination among relevant national and international stakeholders is crucial for a successful response. Allocating USD 500,000 to this item will enable the establishment of communication channels, information sharing platforms, and coordination mechanisms. Efforts to foster effective communication and coordination among relevant national and international stakeholders should commence in the eighth year of the strategy. Establishing robust communication channels and coordination mechanisms enables the timely exchange of information, resource allocation, and collective decision-making during animal health emergencies.

577. Conducting a thorough assessment of existing vector control measures and challenges faced in controlling the spread of vector-borne diseases is essential. Allocating USD 1 million to this component will support comprehensive research and analysis, leading to informed decision-making and targeted interventions. A thorough assessment of existing vector control measures and the challenges faced in controlling the spread of vector-borne diseases should be conducted in the ninth year of the strategy. This assessment should identify gaps and limitations in current practices and provide insights into the most effective control strategies.

578. Adopting an integrated approach to vector management, combining various control methods, is necessary for effective control strategies. Allocating USD 1.5 million to this item will support the implementation of integrated vector management practices, including biological, chemical, and environmental approaches. The adoption of an integrated approach to vector management, combining various control methods, should commence in the tenth year of the strategy. This approach

involves utilizing a combination of physical, chemical, biological, and environmental control methods to effectively manage vector populations and reduce the transmission of vector-borne diseases.

579. Encouraging research and innovation in vector control methods and technologies is crucial for staying ahead of emerging vector-borne diseases. Allocating USD 1 million to this component will enable the support of research projects and the development of novel control strategies. Encouraging research and innovation in vector control methods and technologies should commence in the fifth year of the strategy.

580. Supporting studies on vector behavior, resistance patterns, and emerging vector-borne diseases will guide the development of effective control strategies. Allocating USD 500,000 to this item will facilitate research initiatives and enhance understanding of vector-borne diseases. Studies on vector behavior, resistance patterns, and emerging vector-borne diseases should commence in the seventh year of the strategy.

581. Allocating sufficient financial resources to support the implementation of vector control measures and the contingency plan is essential for successful outcomes. Allocating USD 1.5 million to this component will ensure the availability of necessary resources and the sustainability of control efforts. Allocating sufficient financial resources to support the implementation of vector control measures and the contingency plan should commence in the first year of the strategy.

Strategic Pillar 5: Establish long-term frameworks for prompt and consistent coordination

Programme 5.1: Funding of veterinary services and related institutions

582. Ensuring sufficient funding is essential for the successful implementation of any strategy. Allocating a substantial portion of the budget towards this item is crucial as it serves as the foundation for all other initiatives. The appropriate amount for this purpose would be approximately USD 10.5 million. This allocation would provide the necessary resources to support the various components of the strategy effectively, such as staffing, infrastructure, and research and development efforts. This activity should ideally start in the first year itself to establish a solid financial base for the entire duration of the strategy. To accomplish this, it is crucial to conduct a thorough analysis of financial needs and potential sources of funding.

583. Partnering/Collaborating with government agencies can greatly enhance the reach and impact of initiatives. To allocate funds for this purpose, we need to consider the specific programs and projects that require government support. The appropriate amount for this purpose would be approximately USD 7 million. These funds could be utilized for joint research, capacity building, and the development of regulatory frameworks. This collaboration should involve extensive discussions, negotiation, and the development of mutually beneficial agreements. This partnership should ideally commence in the third year to allow sufficient time for building relationships, establishing collaboration frameworks, and aligning goals and objectives.

584. Collaborating with private organizations, such as animal welfare organizations and veterinary associations can significantly contribute to the success of our initiatives by leveraging their expertise,

networks, and resources. Allocating usd 8.75 million, to this item would enable establishing fruitful collaborations with private organizations. These funds could be utilized for supporting joint projects, organizing conferences and workshops, and facilitating knowledge exchange between different stakeholders. This collaboration should ideally commence in the fifth year to allow sufficient time for building partnerships, developing joint programs, and leveraging shared expertise.

585. Raising public awareness about the importance of animal healthcare is crucial for fostering a culture of responsible pet ownership and promoting overall animal welfare. Allocating USD 8.75 million, to public awareness campaigns would enable to effectively educate and engage the public. These funds could be utilized for developing multimedia campaigns, organizing educational events, and creating informative materials aimed at increasing awareness about animal health and welfare. Raising public awareness about the importance of animal health care is a key activity that should ideally begin in the eighth year of the ten-year strategy. By this stage, the groundwork laid in the initial years, including securing funding, establishing partnerships, and developing collaborative programs, would have laid a solid foundation for effective awareness campaigns.

Programme 5.2: Investing in scientific research and development to enhance understanding of animal diseases

586. Research is the foundation of progress in veterinary and medical sciences. Allocating a substantial portion of the budget to funding research will empower scientists and institutions to conduct groundbreaking studies. Approximately USD 30 million should be allocated to this area. This funding can be utilized for grants, scholarships, and research projects that focus on understanding the causes, prevention, and treatment of animal diseases. Moreover, it should prioritize research that bridges the gap between veterinary and medical sciences, as well as translational research that can directly benefit both animals and humans. To kickstart the ten-year strategy, increasing funding for research should commence in the first year. This will involve engaging policymakers, government agencies, and private funding organizations to allocate additional resources towards animal disease research. Throughout the ten-year period, efforts must continue to ensure sustained funding for animal disease research, facilitating advancements in diagnostics, treatments, and prevention strategies.

587. Collaboration and knowledge exchange are vital for scientific progress. Allocating USD 15 million towards fostering collaboration among veterinary and medical scientists will enhance interdisciplinary research efforts. This can be achieved by organizing conferences, workshops, and symposiums that bring together experts from both fields. A portion of the budget should be allocated to establishing joint research projects between veterinary and medical institutions to encourage a seamless exchange of ideas, methodologies, and best practices. Effective collaboration and knowledge exchange are pivotal in accelerating scientific progress. In the first year, an ambitious initiative should be launched to foster collaborations among research institutions, veterinary hospitals, medical centers, and relevant stakeholders. Over the course of the ten-year strategy, continuous efforts to encourage collaboration and knowledge exchange should be made, ensuring the sustained sharing of expertise and fostering interdisciplinary approaches to tackling animal diseases.

588. Interdisciplinary research holds immense potential in tackling complex animal diseases and advancing medical knowledge. Allocating USD 10 million towards promoting interdisciplinary research will encourage scientists from veterinary and medical backgrounds to collaborate closely. This funding

can be utilized for establishing dedicated research centers that facilitate joint projects, supporting interdisciplinary research fellowships, and incentivizing researchers to bridge the gap between these two fields. Such initiatives will foster innovation and accelerate the development of effective strategies to combat animal diseases. In year three, dedicated efforts should be made to promote interdisciplinary research among veterinary and medical scientists. This can be achieved by establishing joint research programs, creating incentives for cross-disciplinary collaborations, and developing specialized training programs that bridge the gap between veterinary and medical sciences. Throughout the remaining years of the strategy, continuous support and resources should be allocated to sustain and expand interdisciplinary research initiatives, aiming to break down traditional barriers and foster a collaborative approach to animal disease research.

589. Public awareness plays a critical role in garnering support for research and development efforts related to animal diseases. Allocating USD 5 million towards raising public awareness will help educate the general public about the importance of scientific research and its impact on animal and human health. This funding can be utilized for the development of educational campaigns, public lectures, and interactive workshops that engage communities. Additionally, investing in digital media platforms can amplify the reach of awareness initiatives, ensuring that accurate information reaches a wider audience. In the first year, a comprehensive public awareness campaign should be launched, utilizing various channels such as educational programs, social media campaigns, and collaborations with media outlets. Throughout the ten-year strategy, periodic evaluations and adjustments should be made to ensure the campaign remains effective, evolving with changing societal dynamics and technological advancements.

4. Monitoring and Evaluation

590. The Policy will be used as a guide toward achieving the Vision and Mission of the animal health sub-sector in Yemen. MAI will conduct spot checks and joint annual reviews on the implementation of the Policy with key stakeholders to assess the progress made. MAI will also conduct a mid-term and a final review of the implementation of the Policy to assess its impact.

Food and Agriculture Organization of the United Nations

4. Implementation Framework for the Animal Health Strategy 2024 - 2034

Strategic Pillar 1: Improve the capacity of national veterinary institutes to deliver efficient animal health services														
Outcome: Sustainably develop the capacity of National Veterinary Services through smart investments, safeguarding health and food security, and improving the lives of individuals whose livelihoods depend on healthy livestock														
Activities	Performance indicators	Annual targets											Estimated cost in USD	Responsible institutions
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		
Programme 1.1: Establishment/rehabilitation of Veterinary Diagnostic Laboratories														
Assessing the current state of veterinary diagnostic laboratories														
Conduct a comprehensive assessment to understand the current state of veterinary diagnostic laboratories and other animal health infrastructures	- Completion rate of surveys, interviews, and data analysis from relevant stakeholders. - Timely delivery of a comprehensive report with findings and recommendations. - Proportion of recommendations translated into actionable plans												1,000,000	MAI, MAIF, FAO, ICRC
Develop a long-term strategic plan for reconstructing veterinary diagnostic laboratories and other animal health infrastructures	- Number and diversity of stakeholders involved in plan development. - Level of government and stakeholders' commitment to implementing the plan.												3,000,000	MAI, MAIF, FAO, ICRC
Investing in veterinary infrastructure and equipment														
Tendering of construction or rehabilitation works, building, operation, maintenance of premises	- Efficiency and fairness of the tendering process. - Completion of construction or rehabilitation within timeframe and budget.												4,000,000	MAI, MAIF, FAO, ICRC WB
Training and capacity building to ensure the smooth operation of veterinary diagnostic laboratories														

Provide training programs to enhance the knowledge and skills of veterinary professionals and animal health workers on veterinary diagnostic	- Number and diversity of veterinary professionals and animal health workers trained. - Pre- and post-training assessments demonstrating skill development. - Integration of training into existing educational systems or ongoing programs.												2,000,000	MAI, MAIF, FAO, ICRC
Develop an outreach program to raise awareness on the importance of veterinary diagnostic	- Increase in knowledge and understanding of veterinary diagnostic among target audiences. - Increased utilization of veterinary diagnostic services by livestock owners and breeders. - Positive media attention and public engagement on the importance of veterinary diagnostic.												1,000,000	MAI, MAIF, FAO
Quality Assurance and Accreditation														
Establish comprehensive standards and guidelines for laboratory procedures	- Clarity, completeness, and relevance of established standards and guidelines. - Level of agreement and acceptance of standards and guidelines by relevant stakeholders.												1,000,000	MAI, MAIF, FAO, WOAH
Develop/implement a system for accrediting veterinary practitioners and animal health facilities	- Growth in the number of accredited veterinary practitioners and animal health facilities. - Level of adherence to established standards and guidelines by accredited facilities.												1,000,000	MAI, MAIF, FAO, WOAH
Conduct regular monitoring and evaluation of animal health services to assess compliance with standards	- Frequency and effectiveness of monitoring and evaluation procedures. - Implementation rate of recommendations following audits and evaluations.												500,000	MAI, MAIF, FAO, WOAH

Foster collaboration among relevant stakeholders, including government agencies, veterinary associations, academia, and international organizations	- Level of engagement and contribution from diverse stakeholders in collaborative activities. - Number and effectiveness of collaborative projects and programs among stakeholders.													1,000,000	MAI, MAIF, FAO
Raise awareness among livestock owners, breeders, and other stakeholders about the importance of adhering to quality standards and seeking services from accredited facilities	- Growth in the number of livestock owners and breeders seeking services from accredited facilities. - Recognition of economic benefits and value proposition of quality animal health services.													500,000	MAI, MAIF, FAO, WOAH
Continuously review and update standards and guidelines based on scientific advancements and changing needs	- Frequency of reviews and updates to standards and guidelines based on scientific advancements and changing needs. - Dissemination and adoption of updated standards and guidelines by relevant stakeholders.													500,000	MAI, MAIF, FAO, WOAH
Programme 1.2: Access to Quality Veterinary Care															
Facilitating the assessment of compliance of veterinary services with OIE quality standards PVS tool															
Address evolving challenges and priorities in animal and veterinary public health	- Track incidents of diseases transmissible from animals to humans. - Measure time to identify and control new outbreaks. - Assess the effectiveness of interventions addressing identified challenges.													4,000,000	MAI, MAIF, FAO
Strengthening education and training															
Update curricula, ensuring they align with international standards and cover essential topics in animal health	- Compare graduates' qualifications to established benchmarks. - Track coverage of key subject areas like biosecurity, food safety, and zoonoses. - Monitor how often revisions are made to reflect industry													2,000,000	MAI, MAIF, Universities

	advancements and emerging threats.													
Establish or enhance veterinary schools and colleges	- Measure admissions, retention, and completion figures. - Assess infrastructure conditions and resource availability. - Track academic credentials and research productivity of teaching staff.												3,000,000	MAI, MAIF, Veterinary Schools or Colleges
Scholarships and study abroad programs	- Monitor participation in financial aid and international exchange initiatives. - Track how many participants return to contribute to the veterinary workforce.												1,000,000	MAI, MAIF, University, Research Organizations, Veterinary Schools or Colleges
Foster partnerships and collaborations with international organizations	- Monitor collaborative agreements and the scope of joint activities. - Assess joint research projects, training programs, and information sharing initiatives. - Track involvement in collaborative responses to animal health emergencies.												2,000,000	MAI, MAIF
Support research initiatives in animal health, epidemiology, and AMR and disease surveillance	- Measure allocated budget and research output in peer-reviewed journals. - Assess citations and impact of research on international understanding of animal diseases.												1,000,000	MAI, MAIF, Universities, Research Organisations
Expanding veterinary services in rural areas														
Advocate for rural veterinary care and implement Veterinary Loan Program	- Measure the availability, effectiveness of veterinary services in rural communities. - Track affordability and utilization of veterinary services by rural communities.												1,000,000	MAI, MAIF, FAO
Increasing awareness and education														

Development of educational campaigns, public lectures, and interactive workshops	- Monitor participation in the loan program and financial resources allocated. - Assess program's impact on closing gaps in veterinary service availability.												1,000,000	MAI, MAIF, FAO
Programme 1.3: Development of Mobile Veterinary Units														
Designing the mobile unit														
Conduct a comprehensive assessment to understand the specific needs and challenges	- Demographic, socio-economic, animal health statistics, infrastructure survey. - Identification of needs, challenges, opportunities												2,000,000	MAI, MAIF, FAO
Develop a detailed plan	- Clear objectives, activities, timelines, and responsibilities. - Realistic budget, resource allocation, and risk assessment.												1,000,000	MAI, MAIF, FAO
Establishing mobile veterinary clinics and provision of equipment														
Secure appropriate vehicles and equipment necessary	- Ensure operational effectiveness. - Purchase vehicles and equipment.												1,500,000	MAI, MAIF, FAO
Training and deploying veterinary staff														
Provide training on animal health management, treatment protocols, emergency response, and basic veterinary care	- Number of training per target group - Knowledge and skills gained, assessed through tests or practical exercises.												2,500,000	MAI, MAIF, FAO
Establishing collaborative partnerships and funding														
Develop a sustainable funding mechanism to support the operation and maintenance	- Grants, fundraising, local contributions, income-generating activities. - Clear financial reporting and audit processes. - Budget projections and contingency plans.												1,500,000	MAI, MAIF, FAO
Establish collaborations and partnerships	- Joint activities, resource sharing, mutual support.												1,000,000	MAI, MAIF, FAO

	- Enhanced reach, expertise, and sustainability.													
Promoting community engagement														
Develop an outreach program to raise awareness	- Number of awareness campaigns, education materials, community events. - Women's participation and access to benefits. - Environmental impact of project activities.												500,000	MAI, MAIF, FAO
Continuously monitor and evaluate the performance, impact, and cost-effectiveness														
Implement a monitoring and evaluation system to assess the effectiveness and impact	- Regular monitoring of project indicators. - Regular assessment of progress, impact, and challenges.												500,000	MAI, MAIF, FAO
Programme 1.4: Veterinary Personnel Training and Development														
Strengthening veterinary educational institutions														
Conduct training programs for the veterinary professionals	- Number of veterinarians trained per year/quarter - Increase in knowledge and skills of participants - Satisfaction of participants with the training program												1,000,000	MAI, MAIF, FAO, Universities
Organize regular training seminars for veterinarians, para-veterinarians, and other relevant stakeholders (CAHW)	- Number of seminars held per year/quarter - Improvement in knowledge and skills of participants												500,000	MAI, MAIF, FAO, Veterinary Schools or Colleges
Invest in facilities, laboratories, and equipment to support practical training, research, and diagnostic capabilities	- Number of new/upgraded facilities, labs, and equipment - Improved diagnostic accuracy and efficiency - Utilization rate of facilities, labs, and equipment												750,000	MAI, MAIF, FAO, Research Organizations,
Promote continuous professional development by organizing conferences, webinars, and online training platforms	- Number of seminars held per year/quarter												500,000	MAI, MAIF, FAO, University,

	- Improvement in knowledge and skills of participants													Research Organisations
Establishing continuing education programs														
Provide continuous training and professional development opportunities for faculty members and staff	- Percentage of faculty and staff participating in training programs - Types of training programs offered - Improvement in teaching and research skills of faculty and staff												300,000	MAI, MAIF, University, Research Organisations
Implement mechanisms for quality assurance and accreditation to ensure that educational institutions meet and maintain the required standards for academic programs, faculty qualifications, and student outcomes	- Number of institutions accredited - Compliance with accreditation standards - Student satisfaction with the quality of education - Employment rates of graduates												200,000	MAI, MAIF, University, Research Organizations, Veterinary Schools or Colleges
Conduct awareness campaigns to highlight the importance of animal health and its impact on public health, food security, and the economy	- Number of people reached through awareness campaigns - Increased awareness and understanding of animal health issues - Change in attitudes and behaviors towards animal health												300,000	MAI, MAIF, FAO
Encourage and support research activities that address important animal health challenges	- Number of research projects funded - Amount of funding invested in research - Publications in peer-reviewed journals												500,000	MAI, MAIF, University, Research Organizations,
Regularly assess the effectiveness of educational programs, teaching methods, and learning outcomes	- Student performance on standardized tests - Graduate employment rates												150,000	MAI, MAIF, University, Research Organizations, Veterinary Schools or Colleges
Advocate for supportive policies and regulations that prioritize the development and growth of educational institutions in the national animal health sector	- Number of policies and regulations advocated for - Number of policies and regulations adopted												100,000	MAI, MAIF, University, Research Organizations, Veterinary

	- Increased funding for animal health education - Improved regulatory environment for animal health education													Schools or Colleges
Strengthening public-private partnerships														
Foster collaborations and partnerships with international educational institutions, research organizations, and donor agencies	- Number of partnerships established - Joint research projects conducted - Exchange of students and faculty - Mobilization of resources for animal health education												200,000	MAI, MAIF
Establish scholarships, grants, or financial aid programs to attract and support talented students	- Number of scholarships, grants, or financial aid programs offered - Number of students awarded scholarships, grants, or financial aid												200,000	MAI, MAIF, University, Research Organisations
Reviewing the veterinary curricula														
Update curricula, ensuring they align with international standards and cover essential topics in animal health	- Frequency of curriculum updates - Compliance with international standards - Relevance of curriculum to current needs of the animal health sector												300,000	MAI, MAIF, University, Research Organizations, Veterinary Schools or Colleges
Standardizing certification and licensing														
Assessment of Existing Policies and Regulations	- Number of policies and regulations assessed - Gaps identified in policies and regulations - Implementation of recommendations for improvement to policies and regulations												250,000	MAI, MAIF, FAO
Engage with relevant stakeholders to seek their input and collaboration in the standardization process	- Number of stakeholder meetings or workshops held - Level of participation from different stakeholder groups												300,000	MAI, MAIF

	- Number of stakeholder inputs incorporated into the standardization process														
Establish a framework for certification and licensing standards	- Number of standards developed and approved - Clarity and comprehensiveness of the standards - Alignment of standards with international best practices - Public accessibility of the standards													400,000	MAI, MAIF, FAO, WOAH
Design and implement training programs to enhance the knowledge, skills, and expertise of individuals involved in animal health	- Number of training programs developed and delivered - Number of individuals trained													600,000	MAI, MAIF, FAO, WOAH
Establish an accreditation or certification body responsible for evaluating and approving training programs, institutions, and individuals seeking certification or licenses in animal health	- Number of institutions or individuals accredited or certified - Transparency and fairness of the accreditation/certification process - Credibility and reputation of the accreditation/certification body													400,000	MAI, MAIF, FAO, WOAH
Develop a comprehensive licensing system that outlines the application process, evaluation criteria, and renewal requirements for veterinary professionals, animal health technicians, and related personnel	- Number of applications received for licenses - Number of licenses granted - Timeliness of the licensing process													350,000	MAI, MAIF, FAO, WOAH
Implement mechanisms to enforce the certification and licensing standards	- Number of inspections conducted - Number of violations identified and addressed - Deterrence of non-compliance with the standards													300,000	MAI, MAIF, FAO, WOAH
Establish a monitoring and evaluation framework to assess the effectiveness and impact of the standardization efforts	- Regularity of data collection and analysis - Quality and reliability of data - Clear and measurable indicators of program effectiveness - Use of data to inform decision-making and program improvement													200,000	MAI, MAIF, FAO, WOAH

Conduct public awareness campaigns to educate animal owners, farmers, and the general public about the importance of certified and licensed professionals in ensuring animal health and welfare	- Reach of the campaigns - Level of understanding and awareness about the importance of certified and licensed professionals - Change in attitudes and behaviors towards animal health care												400,000	MAI, MAIF, FAO
Programme 1.5: Enabling legislation on Animal Welfare, Handling, and Transportation, and Traditional Knowledge														
Conduct comprehensive research and assessment														
Conduct Inspections, field investigations and Reporting Animal Welfare Concerns	- Number of inspections and investigations conducted per year. - Compliance rate with relevant animal welfare regulations. - Quality of investigation reports and follow-up actions. - Number of successful prosecutions for animal cruelty.												500,000	MAI, MAIF, FAO, WOAH Universities, Research Organizations, veterinary professionals
- Policies addressing funding for animal welfare research and innovation, and education - Understand the roles of private and public assessment and the long-term consequences of implementing different animal welfare strategies	- Amount of funding allocated to animal welfare research and innovation. - Number of research projects funded that address animal welfare concerns. - Development of new educational materials and programs on animal welfare. - Number of private and public assessment bodies engaged with animal welfare. - Development of evidence-based animal welfare strategies.												1,500,000	MAI, MAIF, FAO, Universities, Research Organizations, veterinary professionals
Establishing standards and certification processes for the														
Develop: - Animal use protocol - Ethical guidelines on the humane handling, care, treatment, and transportation of animals - Standard operating procedures (SOPs)	- Number of protocols reviewed and approved. - Compliance of protocols with relevant regulations. - Clarity and comprehensiveness of guidelines.												1,000,000	MAI, MAIF, FAO, Universities, Research Organizations, veterinary professionals

Codes of conduct	- Adoption and implementation of guidelines by institutions. - Number of SOPs developed and implemented. - Compliance with SOPs by staff. - Number of codes of conduct developed and adopted. - Awareness and understanding of codes of conduct by staff. - Compliance with codes of conduct.														
Train and deploy veterinarians and support staff															
Research staff training in Biosafety, Compliance and Regulatory Programs	- Number of staff trained in Biosafety, Compliance, and Regulatory Programs. - Knowledge and skills gained by staff through training.													500,000	MAI, MAIF, FAO, Universities, Research Organizations, veterinary professionals
Train Veterinary and other professional staff veterinarians, Animal Care Personnel, Research Team on animal welfare, handling, and transportation, and traditional knowledge	- Number of veterinarians and other professional staff trained in animal welfare, handling, and transportation. - Improvement in animal care practices. - Utilization of traditional knowledge in animal welfare practices.													500,000	MAI, MAIF, FAO, Universities, Research Organizations, veterinary professionals
Develop and implement legislation															
Develop and implement robust regulatory frameworks for animal health and welfare	- Clarity and comprehensiveness of animal health and welfare regulations. - Effectiveness of regulations in protecting animal welfare. - Compliance with regulations by institutions and individuals.													500,000	MAI, MAIF, FAO, Universities, Research Organizations, veterinary professionals
Develop regulation and policy to respond to animal welfare concerns and non-compliance	- Timeliness and effectiveness of response to animal welfare concerns. - Consistency of enforcement actions for non-compliance.														MAI, MAIF, FAO, Universities, Research Organizations,

														veterinary professionals
Establish an Institutional Animal Care and Use Committee	- Composition and qualifications of IACUC members. - Thoroughness of IACUC review of animal use protocols. - Effectiveness of IACUC in promoting animal welfare.													MAI, MAIF
Strengthening legislation and enforcement	- Effectiveness of legislation in protecting animal welfare. - Adequacy of resources for enforcement of animal welfare laws. - Public awareness of animal welfare laws and enforcement efforts.													MAI, MAIF
Promote community engagement to improve animal welfare														
Networking & Collaboration, Community Meetings and Workshops	- Number and strength of partnerships with government agencies, local institutions, and stakeholders. - Increased awareness and engagement of communities in animal welfare.												500,000	MAI, MAIF
Government Partnerships, Local institutions, Stakeholder meetings	- Development of welfare guidelines for traditional farm animal species. - Increased public understanding of the welfare needs of traditional farm animals.													MAI, MAIF
Incorporate traditional knowledge into animal welfare policies and practices														
Assess drivers and barriers when integrating traditional knowledge into animal welfare with other ethical important issues	- Identification of drivers and barriers to integrating traditional knowledge into animal welfare.												250,000	MAI, MAIF
Address the welfare of traditional farm animal species, kept for the production of meat, milk, eggs	- Development of strategies to overcome barriers and promote integration. - Increased utilization of traditional knowledge in animal welfare practices.												250,000	MAI, MAIF

Raising awareness and building public support															
Workshops, Webinars, Infographics, Rewards & Recognition, Local Capacity Building	- Number of training events conducted and participants reached. - Development of local capacity to address animal welfare issues.												500,000	MAI, MAIF

Strategic Pillar 2: Improve disease prevention and control strategies for safe animal health delivery														
Outcome: enhance biosecurity and implement One health approaches for the prevention and management of transboundary animal and zoonotic disease, with the focus on strengthening disease intelligence and information system														
Programme 2.1: Development of a National Strategy to Control and Eradicate Peste des Petits Ruminants (PPR)														
Promotion of an enabling environment														
Setting of a technical committee of experts on PPR	- Number of experts with relevant expertise and experience in PPR. - Frequency of meetings and activities of the committee. - Quality and relevance of recommendations provided by the committee.												500,000	MAI, MAIF FAO, GIZ, WB, WOAH, ICRC
Develop/update and harmonize SOPs for laboratory procedures, training, quarantine, surveillance, etc.	- Number of SOPs developed or updated for different areas - Level of harmonization of SOPs with national and international standards. - Adoption and effective utilization of SOPs by target beneficiaries.												800,000	MAI, MAIF FAO, WOAH
Develop legal instruments and legislation for the control and eradication of PPR and strengthen the enforcement of relevant sections of existing animal diseases control legislation	- Number of legal instruments developed or revised for PPR control and eradication. - Level of alignment of laws with international standards and best practices. - Number of infringement cases reported and prosecuted.												700,000	MAI, MAIF FAO, WOAH

Stakeholders' awareness and engagement for different segments of society about existing regulations and laws	- Level of understanding and compliance with regulations among stakeholders. - Participation of stakeholders in awareness-raising activities and trainings.												500,000	MAI, MAIF FAO, WOAH
Develop measures towards PPR eradication														
A 3-year mass vaccination of targeted 80% of the national sheep and goats herd	- Percentage of targeted sheep and goat herd vaccinated annually. - Vaccine coverage rate - Adverse events reported and addressed during vaccination campaigns.												2,000,000	MAI, MAIF FAO, ICRC
Post vaccination sero-monitoring carried out to assess the effectiveness of the vaccinations	- Number of animals and representative regions covered in monitoring. - Percentage of animals with detectable antibodies against PPR virus.												300,000	MAI, MAIF FAO, ICRC
1-year targeted vaccinations in PPR high risk areas (post 3-year programme)	- Selection criteria for identifying high-risk areas. - Vaccination coverage rate in high-risk areas. - Reduction in PPR outbreaks in high-risk areas compared to pre-vaccination period.												1,000,000	MAI, MAIF FAO, ICRC
Mop-up vaccination for the young/new additions for the next 1 year	- Percentage of young or newly added animals vaccinated. - Prevention of outbreaks by targeting susceptible animals.												200,000	MAI, MAIF FAO, ICRC
Biosecurity and animal movement control	- Number of farms/markets implementing biosecurity measures. - Compliance with animal movement control regulations. - Reduction in cross-border transmission of PPR.												500,000	MAI, MAIF FAO, ICRC

Enhance disease surveillance and early detection and response interventions in areas where PPR continue to persist	- Sensitivity and specificity of diagnostic tests used. - Timeliness and efficiency of reporting suspected PPR cases. - Number of PPR outbreaks contained within defined timeframe.												600,000	MAI, MAIF FAO, ICRC
Engagement of private veterinarians in vaccination and biosecurity	- Number of private veterinarians trained and involved in vaccination and biosecurity activities. - Participation of transporters, marketers, and processors in animal movement control efforts. - Level of collaboration and information sharing among different stakeholders.												300,000	MAI, MAIF FAO, ICRC
Engagement of transporters, marketers and processors in animal movement control, etc.	- Percentage of transporters, marketers, and processors registered in a tracking system. - Compliance rate with regulations on movement permits and documentation. - Frequency of attendance at training workshops and awareness campaigns.												400,000	MAI, MAIF FAO, ICRC, Chamber of Commerce
Verify eradication of PPR leading to WOAH accreditation of freedom	- Completion of all required steps for verification of PPR freedom.												300,000	MAI, MAIF FAO, ICRC, WOAH
Application for the PPR freedom certification from the WOAH	- Successful assessment by WOAH for recognition of PPR-free status.													MAI, MAIF FAO, ICRC, WOAH
Control of other small ruminants diseases in support of PPR eradication														
Incorporation of contagious carprine pleura-pnemonia, brucellosis, endo- and ecto-parasites and sheep/goat pox	- Development and implementation of control and eradication strategies for other identified diseases												160,000	MAI, MAIF FAO, ICRC
Adequately equip and mobilize to handle helminthosis, ectoparasitism and pox cases with wormers, antiprotozoans and pox vaccines	- Availability and accessibility of necessary drugs and vaccines for targeted diseases.												300,000	MAI, MAIF FAO, ICRC

	- Capacity of veterinary services to diagnose and treat these diseases													
Coordination, Management and Partnerships														
Establish/strengthen the national level coordination and management structure	- Effectiveness of the national level coordination and management structure. - Regular communication and collaboration among different stakeholders involved. - Efficient utilization of resources for PPR control and eradication program.												250,000	MAI, MAIF FAO, ICRC
CVL properly networked with all laboratories spread across the country	- Strength and functionality of the network between CVL and other laboratories.												150,000	MAI, MAIF FAO, ICRC
Establish/strengthen the National PPR Coordinating Committee (NPCC) to act as an advisory committee on PPR	- Level of activity and effectiveness of the NPCC in providing guidance and recommendations.												100,000	MAI, MAIF FAO, ICRC
Participation at cross border, regional animal health and production networks' meetings /Sharing of data and information	- Active participation in regional animal health networks and meetings. - Implementation of joint vaccination campaigns and control activities with neighboring countries. - Successful outcomes of capacity building initiatives in various areas related to PPR control.												100,000	MAI, MAIF FAO, ICRC
Joint vaccination campaigns/Cross-border collaboration on PPR control activities with bordering countries	- Number of cross-border coordination meetings held. - Joint surveillance activities conducted with bordering countries. - Level of information sharing and communication between countries.												150,000	MAI, MAIF FAO, ICRC
Sponsorship and funding of capacity building mechanisms in various areas	- Number of individuals trained or equipped through sponsored programs.												200,000	MAI, MAIF FAO, ICRC

	- Sustainability of capacity building efforts (e.g., continued use of trained personnel or equipment).														
Programme 2.2: Implementation of Prevention and Control measures for sheep and goat pox outbreaks															
Establishment of an active surveillance system to monitor disease outbreaks, identify new cases, and track the effectiveness of the vaccine (culling infected and in-contact sheep/goats)															
Timely Recognition of Disease Eruption of sheep pox virus (SPPV) and goat pox virus (GTPV)	- Percentage of infected herds diagnosed within the first 7 days of disease onset. - Accuracy of diagnostic tests (PCR, ELISA) in detecting SPPV/GTPV. - Average time taken to initiate movement restrictions, culling, and other interventions after confirmed diagnosis.													200,000	MAI, MAIF FAO, ICRC
Early detection and notification, prompt movement restriction of animals, an extension of duration and size of the protection zone and culling affected herds, based on clinical signs	- Percentage of suspected cases reported to veterinary authorities within 24 hours. - Number of outbreaks identified through active surveillance compared to passive reporting. - Average time taken to isolate infected herds after notification.													300,000	MAI, MAIF FAO, ICRC
Restricting the movement of animals to prevent the spread of the disease.	- Percentage decrease in animal movement within and outside affected areas compared to pre-outbreak levels. - Percentage of farms adhering to movement restrictions. - Number of illegal animal movements intercepted.													400,000	MAI, MAIF FAO, ICRC
Isolation of Infected Animals by moving healthy animals away from them.	- Percentage of herds where healthy animals remain healthy after isolation. - Decrease in the number of new cases within quarantined herds compared to non-quarantined herds.													400,000	MAI, MAIF FAO, ICRC

Quarantine Before Introduction in the Herd	- Duration of quarantine until no further cases detected.												300,000	MAI, MAIF FAO, ICRC
Conducting mass vaccinations of susceptible animals in affected regions using effective and safe vaccines (vaccination and mass treatment campaigns)														
Live attenuated vaccines available for SPP/GTP	- Percentage of sheep and goats vaccinated within target populations. - Percentage of vaccinated animals with detectable antibodies against SPPV/GTPV. - Incidence of outbreaks in vaccinated versus non-vaccinated populations.												400,000	MAI, MAIF FAO, ICRC
Sanitary measures														
Cleaning and Disinfection	- Percentage of farms adhering to recommended cleaning and disinfection procedures. - Effectiveness of disinfection procedures in reducing viral contamination.												200,000	MAI, MAIF FAO, ICRC
Disinfection of Equipment that has come into contact with infected animals should be disinfected.	- Frequency of disinfection in affected areas.													MAI, MAIF FAO, ICRC
Proper Disposal of Carcasses and Products from infected animals	- Percentage of carcasses and products from infected animals disposed of according to recommended guidelines - Awareness among communities regarding safe disposal practices.												100,000	MAI, MAIF FAO, ICRC
Awareness Raising Campaigns														
Awareness raising campaigns for farmers and veterinary staff to promote recognition of the disease should be considered.	- Percentage of individuals who can correctly identify clinical signs of SPPV/GTPV and report suspected cases. - Increase in reporting rates and adoption of preventive measures after awareness campaigns. - Media coverage and public engagement in disease control efforts.												200,000	MAI, MAIF FAO, ICRC

Maintaining strict biosecurity standards at farms and markets to prevent the introduction or spread of the virus (Practicing Strict Biosecurity)														
Reporting Suspicion of Sheep or Goat Pox.	- Clear and easy-to-understand instructions for reporting suspected cases. - Reporting forms readily available and easy to use. - Number of training of animal health workers on how to recognize and report suspected cases.												100,000	MAI, MAIF FAO, ICRC
Programme 2.3: Implementation of a National Foot and Mouth Disease Control Strategy														
Strengthening surveillance systems to promptly detect and report any FMD outbreaks														
Training veterinary professionals and farmers on recognizing the clinical signs of the disease	- Percentage of participants passing competency tests on clinical signs of FMD. - Observation and reporting of suspected cases by trained professionals and farmers. - Increased community knowledge about FMD												2,000,000	MAI, MAIF FAO
Establishing a network of reporting mechanisms	- Average time between case observation and reporting to authorities. - Number and diversity of reporting channels available - Percentage of reports containing crucial information for investigation.												1,000,000	MAI, MAIF FAO
Implementing regular monitoring programs	- Rate of farm participation in surveillance activities - Number of infected animals identified through active surveillance per sampling round. - Accuracy and completeness of data collected during monitoring.												1,500,000	MAI, MAIF FAO
Improving biosecurity measures within livestock farms and markets														
Promoting good hygiene practices, such as disinfection protocols, proper waste	- Observational surveys of farms implementing disinfection												500,000	MAI, MAIF FAO

management, and controlled animal movement	protocols, waste management systems, and restricted animal movement. - Environmental sampling to measure pathogen levels on farms.													
Prioritize widespread vaccination coverage among susceptible livestock populations														
Ensuring an adequate supply of vaccines	- Percentage of vaccination sites with sufficient vaccine in stock. - Quality control tests to ensure vaccine efficacy and compliance with cold chain procedures.												4,000,000	MAI, MAIF FAO
Procurement of cold cabinets (ice liners, refrigerators, etc.) and FMD vaccine	- Percentage of vaccination sites equipped with functional cold chain equipment.													MAI, MAIF FAO
Organize vaccination campaigns at regular intervals	- Percentage of target animals vaccinated in each campaign. - Timeliness and efficiency of vaccine deployment and administration.													MAI, MAIF FAO
Educating farmers about the importance of immunization	- Farmers' understanding of vaccination benefits and schedule - Willingness and participation of farmers in vaccination campaigns.													MAI, MAIF FAO
Mass vaccination against FMD: vaccination of the entire susceptible population of bovines, small ruminants (sheep and goats) at six-monthly intervals	- Percentage of bovines and small ruminants vaccinated within six-month intervals. - Proportion of animals developing antibodies after vaccination. - Decline in reported FMD cases over time.												5,500,000	MAI, MAIF FAO
Primary vaccination of bovine calves (4-5 months of age)	- Percentage of calves vaccinated at the recommended age - Impact on herd immunity: Serological monitoring of antibody levels in young animals.													MAI, MAIF FAO
Deworming one month prior to vaccination	- Percentage of animals dewormed prior to vaccination. - Evaluation of potential effect of deworming on antibody response.													MAI, MAIF FAO

	- Monitoring of overall animal health and productivity.													
Maintaining record of vaccination through Animal Health cards	- Percentage of animals with updated vaccination records in Animal Health cards. - Ease of access and retrieval of vaccination records for authorities and farmers.												500,000	MAI, MAIF FAO
Identification of target animals by ear-tagging, registration and uploading the data in an Animal Productivity and Health Information System	- Percentage of target animals with ear tags and registered in the information system. - Accuracy and completeness of information in the Animal Productivity and Health Information System.													MAI, MAIF FAO
Serosurveillance/seromonitoring of animal population	- Percentage of animals with detectable FMD antibodies through serological tests. - Identification of areas with high or low seropositivity for targeted interventions.												1,500,000	MAI, MAIF FAO
Investigation and virus isolation and typing in case of outbreak	- Duration between outbreak detection and initiation of investigation. - Specificity and sensitivity of diagnostic tests used.													MAI, MAIF FAO
Recording/regulation of animal movement through temporary quarantine/ checkposts	- Percentage of animal movements adhering to quarantine procedures and check post inspections. - Identification and isolation of sick animals during movement. - Evaluation of movement restrictions' impact on outbreak control.													MAI, MAIF FAO
Testing of pre-vaccination and post-vaccination samples	- Accuracy of pre- and post-vaccination tests for detecting antibodies. - Availability and efficiency of diagnostic facilities for outbreak response.													MAI, MAIF FAO

	- Time taken to receive test results for rapid decision-making.													
Generation of data and regular monitoring including evaluation of impact of the programme	- Timeliness of data reporting - Assess how data is used to inform program decisions and track progress towards goals. - Measure program effectiveness through indicators like beneficiary outcomes, cost-benefit analysis, and social impact assessment.													MAI, MAIF FAO
Enhance public awareness about FMD														
Capacity-building programs and training sessions	- Participant attendance and completion rates - Pre- and post-training assessments to measure changes in participants' knowledge and skills.												2,000,000	MAI, MAIF FAO
Publicity and mass awareness campaigns at national, state, block and village level including orientation of the state functionaries for implementation of the programme	- Number of people exposed to the campaign through different channels (media, events, etc.). - Monitor if the campaign has led to any changes in people's behavior, such as adopting new practices or participating in program activities.												500,000	MAI, MAIF FAO
Coordination, Management and Partnerships														
Strong collaboration between government agencies, farmers' associations, veterinary professionals, and other stakeholders to ensure effective implementation	- Monitor how often different stakeholders communicate and the quality of their interaction - number and effectiveness of joint activities and initiatives undertaken by different stakeholders. - Assess the effectiveness of mechanisms for resolving disagreements or conflicts between stakeholders.												500,000	MAI, MAIF FAO
Programme 2.4: Establishment of Preventive and control measures for an effective control of Lumpy Skin Disease														
Immediate culling and safe destruction of infected animals														

Slaughter Campaigns: Infected animals may need to be culled to prevent the spread of the disease.	- Decline in the number of new cases after culling infected animals. - Measure the time between identification of infected animals and their culling. - Adherence to best practices for animal welfare during the culling process.												2,250,000	MAI, MAIF FAO
Management Strategies: This includes maintaining hygiene and biosecurity standards.	- Regularly evaluate adherence to established protocols for animal handling, cleaning, and disinfection. - Measure the levels of pathogens in animal housing and surrounding areas.												1,500,000	MAI, MAIF FAO
Movement controls to avoid long distance spread via direct contact with affected animals														
Movement Control (Quarantine): This involves restricting the movement of animals to prevent the spread of the disease.	- Track the movement of the disease outside of quarantined areas. - Monitor and evaluate the effectiveness of measures to prevent entry or exit of affected animals. - Measure the time taken to establish and enforce quarantine measures after a disease outbreak.												1,000,000	MAI, MAIF FAO
Enhanced Surveillance and Diagnosis	- Monitor the time between disease exposure and identification of new cases. - Evaluate the accuracy of tests used to identify infected animals. - Timely reporting of data: Monitor the speed and accuracy of data collection and reporting from the field.												2,000,000	MAI, MAIF FAO
Research and Development	- Monitor the development of more accurate and rapid diagnostic methods.												1,500,000	MAI, MAIF FAO

	- Assess the efficiency and effectiveness of resource allocation for research activities.													
Strengthening Healthcare Infrastructure	- Monitor the stock levels and accessibility of diagnostic tools, medications, and other resources. - The number and expertise of healthcare workers equipped to handle the disease. - The number and quality of facilities equipped to manage an outbreak - Readiness of healthcare systems to respond to sudden disease outbreaks.												1,250,000	MAI, MAIF FAO
Assess the most suitable duration of a Lumpy Skin Disease vaccination campaign, using live homologous vaccines														
Vaccination: Vaccination is a key strategy in controlling the disease.	- Percentage of the target population that has been vaccinated. - Decline in the number of new cases after a vaccination campaign. - Effectiveness of the vaccine in preventing infection or reducing disease severity.												1,000,000	MAI, MAIF FAO
Awareness for public and private veterinarians as well as veterinary students, farmers, herders, cattle merchants, cattle truck drivers, and artificial inseminators, both in the field and in abattoirs														
Health Promotion and Education, Raising awareness among the affected communities	- The level of understanding about the disease and preventive measures among affected communities. - Changes in community practices related to hygiene, animal handling, and risk reduction. - Level of participation and trust in disease control efforts within affected communities.												1,000,000	MAI, MAIF FAO
Programme 2.5: Implementation of an Animal brucellosis Control and eradication Strategy														
Enhanced surveillance and early detection of infected animals														

Public health and animal health diagnostic laboratories well-equipped and staffed with trained personnel	- Percentage of essential equipment in good working condition. - Number of trained personnel per lab per animal/human population served. - Average time to deliver test results. - Compliance with international standards and participation in external quality assurance programs.												5,000,000	MAI, MAIF, MPHP, FAO
Public health and animal health authorities should coordinate among themselves and exchange data, information and feedback reports vertically and horizontally	- Frequency of collaboration activities. - Established and functional system for information exchange.													MAI, MAIF, MPHP, FAO
The progress of the brucellosis control program should be evaluated annually, and corrective actions adopted where appropriate, or alternative strategies may be considered	- Established metrics for program progress. - Clear assessment of achievements, challenges, and corrective actions. - Evidence of concrete measures taken based												2,000,000	MAI, MAIF, MPHP, FAO
Integration with other animal health programs facilitates the development of brucellosis control program, considering its long duration and cost	- Utilization of existing infrastructure and expertise. - Consistency in disease control approaches across programs.												3,000,000	MAI, MAIF, MPHP, FAO
Transboundary livestock's movements necessitate international collaboration and commitments to ensure sustainability of efficient brucellosis and other zoonoses control programs	- Formalized mechanisms for cooperation with neighboring countries. - Active participation in regional control efforts. - Contribution to global knowledge exchange.												2,000,000	MAI, MAIF, MPHP, FAO
Legislation promulgation and/or amendment should be endorsed where appropriate	- Legal framework for brucellosis control. - Alignment with WOAH recommendations and other relevant treaties.												500,000	MAI, MAIF, MPHP, FAO

	- Timely adaptation of legal framework to address evolving needs.													
Intersectoral collaboration and coordination within and among animal and public health sectors, as well as collaboration with the international organizations	- Joint committees and task forces - Intersectoral training and capacity building - Integration of brucellosis control into broader One Health initiatives.												2,000,000	MAI, MAIF, MPHP, FAO
Strict movement controls														
Strict biosafety and management measures in livestock farms	- Defined protocols for safe handling of pathogens. - Biosecurity audits and inspections - Proper management of infected animal products and materials.												1,500,000	MAI, MAIF, MPHP, FAO
Environmental hygiene and sanitation	- Livestock waste management plan - Access to clean drinking water for animals and humans. - Routine decontamination procedures.												500,000	MAI, MAIF, MPHP, FAO
Effective vaccination campaigns														
Vaccines should originate from the same source, and accepted following quality certification of the seed batch strain by an approved international reference laboratory	- Consistent supply from a reputable manufacturer. - Use of vaccines approved by internationally recognized laboratories. - System for monitoring vaccine distribution and usage.												2,500,000	MAI, MAIF, MPHP, FAO
Vaccination of animals and humans at risk	- Percentage of target population vaccinated (animals and humans). - Adherence to recommended timeframes and booster doses. - Regular assessment of vaccine effectiveness in preventing brucellosis.													MAI, MAIF, MPHP, FAO
Test-and-slaughter strategy for seropositive animals	- Number of seropositive animals identified. - Slaughter and disposal rate of seropositive animals													MAI, MAIF, MPHP, FAO

	- Compensation policies for slaughtered animals													
Immunization of the susceptible population	- Percentage of at-risk individuals vaccinated. - Assessment of safety and protection provided by human vaccines.													MAI, MAIF, MPHP, FAO
Promoting public awareness about brucellosis prevention														
Public health and animal health sectors empowered with sufficient technical and financial resources as well as an appropriate legal background	- Adequacy of financial resources to sustain program activities. - Access to necessary tools and materials for laboratory testing, vaccination.												1,500,000	MAI, MAIF, MPHP, FAO
Animal health personnel trained on the cold chain maintenance and safe use of vaccines	- Proper storage and transportation of vaccines. - Knowledge and skills for safe vaccine handling.												500,000	MAI, MAIF, MPHP, FAO
Personal protection and awareness for humans	- Increase in the percentage of people who can correctly identify brucellosis as a zoonotic disease. - Increase in the percentage of people who vaccinate their animals against brucellosis.												1,000,000	MAI, MAIF, MPHP, FAO
Conducting awareness programmes	- Number of people who attended awareness programs. - Number of people who reached through social media campaigns.													MAI, MAIF, MPHP, FAO
Programme 2.6: National Strategy for Prevention and Control of Avian Influenza														
Regular testing of birds for the presence of the virus and prompt reporting of any suspected cases														
Decreasing Diagnosis Time (from several days to less than six hours)	- Percentage of samples diagnosed within six hours. - Number of rapid diagnostic tests conducted.												2,000,000	MAI, MAIF, MPHP, FAO
Strengthening Surveillance and Response	- Number of active surveillance sites monitoring poultry, wild birds, and other animals.												1,500,000	MAI, MAIF, MPHP, FAO

	- Percentage of suspected cases investigated within 24 hours.													
Reporting suspected outbreaks to a state veterinarian as soon as possible	- Timeliness of reporting suspected outbreaks to state veterinarians												500,000	MAI, MAIF, MPHP, FAO
Prevention	- Vaccination coverage rate in poultry flocks. - Number of farms implementing avian influenza prevention plans. - Reduction in mortality rates from avian influenza outbreaks.												1,500,000	MAI, MAIF, MPHP, FAO
Monitoring the disease on farms to take quick steps and alert others of the danger when an outbreak occurs	- Early detection of new AI virus strains. - Identification of potential sources of infection.												1,000,000	MAI, MAIF, MPHP, FAO
Monitoring Other Animals which can contract influenza and transmit the virus to people	- Percentage of tests positive for AI virus in other Animals.												500,000	MAI, MAIF, MPHP, FAO
Putting robust biosecurity protocols in place, including strict quarantine procedures and regulations regarding the importation and movement of live birds and poultry products														
Strengthening Regional Avian Influenza Surveillance and Response	- Number of countries participating in regional surveillance networks. - Frequency of data sharing and information exchange. - Timeliness of joint response to AI outbreaks in the region. - Level of coordination among regional stakeholders.												1,000,000	MAI, MAIF, MPHP, FAO
Creation of a National Technical Commission for information exchange and analysis between ministries of health, agriculture, and environment	- Frequency of commission meetings. - Quality of information exchange and analysis between ministries. - Development and implementation of national AI control strategies.												500,000	MAI, MAIF, MPHP, FAO
Quarantine and Movement Controls to prevent sick birds from getting into contact with susceptible birds	- Number of quarantine zones established and enforced. - Reduction in movement of poultry and poultry products from high-risk areas.												1,500,000	MAI, MAIF, MPHP, FAO

	- Effectiveness of border controls in preventing AI imports.													
Investment in Prevention and Control to prevent and control avian influenza	- Funding allocated for AI prevention and control programs												1,500,000	MAI, MAIF, MPHP, FAO
Partnership with Organizations	- Number of partnerships established with relevant organizations. - Effectiveness of joint activities in addressing AI challenges.												500,000	MAI, MAIF, MPHP, FAO
National Level Conduct at the national level in partnership with the Ministry of Agriculture and Irrigation	- Level of collaboration between national and local authorities. - Compliance with national AI control plans and guidelines. - Resource allocation and support for local communities.												500,000	MAI, MAIF, MPHP, FAO
Stamping Out: culling of all infected and exposed birds, the correct disposal of carcasses and all animal products, thorough decontamination of infested premises	- Percentage of infected and exposed birds culled within 48 hours of confirmation. - Effectiveness of carcass and animal product disposal procedures.												1,000,000	MAI, MAIF, MPHP, FAO
Risk Communication and Community Engagement Strategies	- Number of people reached by awareness campaigns. - Changes in risk perception and behavior among communities. - Effectiveness of communication channels used to reach communities.												500,000	MAI, MAIF, MPHP, FAO
Hygiene and Biosecurity Standards	- Level of awareness and implementation of biosecurity measures on farms. - Compliance with national hygiene standards in poultry markets and slaughterhouses. - Availability and accessibility of training on biosecurity practices.												1,000,000	MAI, MAIF, MPHP, FAO
Early Detection of Human Infections and Containment Measures	- Timeliness of diagnosis and reporting of human AI cases.												2,000,000	MAI, MAIF, MPHP, FAO

	- Availability and utilization of antiviral medications for treatment. - Reduction in transmission of AI from animals to humans.													
Emphasizing on public awareness campaigns to educate farmers and the general population about avian influenza symptoms, prevention measures, and safe handling practices														
Public awareness campaigns to educate farmers and the general population	- Number of people reached by campaigns. - Changes in behavior to reduce exposure to AI risks. - Effectiveness of campaign messages and materials.												500,000	MAI, MAIF, MPHP, FAO
Programme 2.7: National Strategy for Prevention and Control of Rift Valley fever														
Sanitary prophylaxis														
Control of animal movements (extension of disease) and clinical management of RVF cases	- Reduction in the number of reported outbreaks and cases - Increased animal movement permits - Time to diagnosis and treatment												3,000,000	MAI, MAIF, MPHP, FAO
Controls at slaughterhouses (exposure to disease)	- Percentage of infected animals identified at slaughterhouses through routine testing or clinical signs - Completeness and timeliness of reporting suspected cases from slaughterhouses to veterinary authorities - Compliance with disposal procedures												2,000,000	MAI, MAIF, MPHP, FAO
Draining of standing water to eliminate or reduce vectors	- Percentage of potential breeding sites eliminated or treated with larvicides - Surveillance to monitor changes in mosquito population size and species composition												1,000,000	MAI, MAIF, MPHP, FAO
Disinfestations of low depression accumulations of water where mosquitoes may reproduce													1,000,000	MAI, MAIF, MPHP, FAO
Use of methoprene spraying or controlled burning													1,500,000	MAI, MAIF, MPHP, FAO

Prophylactic measures such as monitoring risk factors and vector populations	- Level of public engagement in reducing breeding sites and implementing preventative measures												2,500,000	MAI, MAIF, MPHP, FAO
Medical prophylaxis														
During mass animal vaccination campaigns, animal health workers may, inadvertently, transmit the virus through the use of multi-dose vials and the re-use of needles and syringes.	- Percentage of eligible animals vaccinated during campaigns - Vaccine availability and accessibility - Number of vaccine doses used compared to the available supply - Active surveillance to detect any potential transmission of the virus through vaccination practices - Number of suspected and confirmed RVF cases reported and investigated - Timeliness of case confirmation												1,500,000	MAI, MAIF, MPHP, FAO
Attenuated virus vaccine, one inoculation confers immunity lasting 3 years safe for all breeds of cattle, sheep and goats														MAI, MAIF, MPHP, FAO
Single injection regimen of inactivated virus vaccine														MAI, MAIF, MPHP, FAO
Needs a booster 3-6 months after initial vaccination, followed by yearly boosters.														MAI, MAIF, MPHP, FAO
Used in outbreak situations and pregnant animals														MAI, MAIF, MPHP, FAO
Public health education and risk reduction														
Promotion of education of personnel	- Percentage of personnel who participate in training programs - Percentage of the target population reached with educational interventions - Changes in attitudes and beliefs about health risks and protective behaviors												1,000,000	MAI, MAIF, MPHP, FAO
Coordination of efforts of stakeholders regarding human and animal health														
Establishment of an active animal health surveillance system to detect new cases is essential in providing early warning for veterinary and human public health authorities.	- Effectiveness of active surveillance systems in detecting risk factors, emerging trends, and potential outbreaks before they escalate. - Regular surveys to assess potential RVF transmission risk. - Reach and effectiveness of educational campaigns in raising												1,500,000	MAI, MAIF, MPHP, FAO

	awareness about RVF, prevention measures, and reporting suspected cases.													
Programme 2.8: National Strategy for Prevention and Control of Clostridia infection														
Enhancing Healthcare Infrastructure														
Improved Access to Diagnosis and Treatment	- Percentage of individuals with access to diagnostic services and treatment for target diseases. - Average time taken for patients to receive diagnosis after symptom onset. - Proportion of patients adhering to prescribed treatment regimens.												400,000	MAI, MAIF, MPHP, FAO
Strengthened Laboratory Capacity	- Number of qualified laboratory personnel - Time taken to process and report test results. - Percentage of labs with necessary resources for testing. - Regular implementation of quality control procedures to ensure accurate results.												700,000	MAI, MAIF, MPHP, FAO
Establish Antibiotic Stewardship Programs	- Number of antibiotic prescriptions per physician or per capita. - Percentage of prescriptions aligned with clinical guidelines. - Changes in antimicrobial resistance patterns over time. - Survey outcomes assessing understanding of responsible antibiotic use.												300,000	MAI, MAIF, MPHP, FAO
Promote Hospital Infection Control Programs	- Compliance with established measures like isolation precautions.												400,000	MAI, MAIF, MPHP, FAO
Public Awareness and Education Campaigns														
Raise Public Awareness	- Number of individuals exposed to awareness messages through various channels.												300,000	MAI, MAIF, MPHP, FAO

	- Changes in public understanding of disease symptoms, risk factors, and prevention strategies.													
Educate High-Risk Groups	- Number of individuals from high-risk groups attending educational sessions or accessing information materials. - Ability to connect with specific target groups and address their unique needs and concerns.												200,000	MAI, MAIF, MPHP, FAO
Utilize Diverse Communication Channels	- Number of individuals accessing information through various platforms like print, digital media, community events, etc. - Collaboration with community leaders and organizations to tailor communication strategies.												3300,000	MAI, MAIF, MPHP, FAO
Promote Proper Hygiene Practices	- Public understanding of the importance and proper hygiene practices. - Changes in hygiene-related behaviors												200,000	MAI, MAIF, MPHP, FAO
Encourage Vaccination	- Percentage of the target population vaccinated against specific diseases - Identification and understanding of factors limiting vaccine uptake												300,000	MAI, MAIF, MPHP, FAO
Strengthening Vaccination Programs														
Expand Vaccine Availability	- Percentage of healthcare facilities with sufficient vaccine stocks. - Ease of access for target populations to get vaccinated in convenient locations.												500,000	MAI, MAIF, MPHP, FAO
Integrate Vaccination into Routine Healthcare	- Consistent protocols for vaccine storage, administration, and record-keeping. - Improved communication and coordination for seamless vaccination service delivery												500,000	MAI, MAIF, MPHP, FAO

Target Specific Populations	- Percentage of individuals within the target population who have received recommended vaccinations. - Proportion of the target population aware of specific vaccination programs and their benefits.												500,000	MAI, MAIF, MPHP, FAO
Monitor Vaccine Effectiveness	- Tracking disease incidence before and after vaccination campaigns												500,000	MAI, MAIF, MPHP, FAO
Promote Vaccine Confidence	- Media coverage of vaccine efficacy and safety - Engagement with educational campaigns												400,000	MAI, MAIF, MPHP, FAO
Research and Development														
Support Research on Clostridial Pathogens	- Number of research projects funded - Scientific publications and patents - Contribution to understanding and preventing clostridial infections												400,000	Universities, Research Organizations
Develop Novel Diagnostics	- Measuring the ability of the new diagnostic to correctly identify true and false positives.												200,000	Universities, Research Organizations
Support Antibiotic Development	- Monitoring changes in antibiotic resistance patterns before and after new antibiotic introduction. - Ensuring equitable distribution and use of new antibiotics												400,000	Universities, Research Organizations
Explore Alternative Prevention Strategies	- Measure the reduction of infections through improved hygiene, sanitation, and vaccination. - Cost-benefit analysis of alternative strategies - Implementation and adoption of alternative strategies												200,000	Universities, Research Organizations

Promote Vaccine Research	- Measuring the impact of interventions on antibiotic prescribing patterns and resistance rates. - Education and training completion rates												400,000	Universities, Research Organizations
Strengthening Infection Control Practices														
Hand Hygiene	- Hand hygiene adherence rate - Compliance with hand hygiene protocols												200,000	MAI, MAIF, MPHP, FAO
Environmental Cleaning	- Compliance with cleaning and disinfection protocols - Incident rates of healthcare-associated infections												100,000	MAI, MAIF, MPHP, FAO
Proper Wound Care	- Wound infection rate - Timely wound assessment and documentation												100,000	MAI, MAIF, MPHP, FAO
Antibiotic Stewardship	- Antibiotic use rate - Inappropriate antibiotic prescribing rate - Antibiotic-resistant organism prevalence												200,000	MAI, MAIF, MPHP, FAO
Staff Education and Training	- Education and training completion rates												200,000	MAI, MAIF, MPHP, FAO
Surveillance Systems														
Establish Surveillance Networks	- Ensuring timely and accurate data entry into surveillance systems.												100,000	MAI, MAIF, MPHP, FAO
Standardize Reporting	- Types of information are being reported for real-time alerts, trend analysis, risk assessment - Timeliness of reporting												100,000	MAI, MAIF, MPHP, FAO
Utilize Electronic Systems	- Types of systems being used for surveillance - Percentage of time the system is functional and accessible												100,000	MAI, MAIF, MPHP, FAO

Analyze Surveillance Data	- Data quality and completeness - Analysis of trends and outbreaks												200,000	MAI, MAIF, MPHP, FAO
Disseminate Findings	- Sharing relevant data and insights with healthcare professionals, policymakers, and the public.												100,000	MAI, MAIF, MPHP, FAO
Programme 2.9: National Strategy for Prevention and Control of Rabies														
Strengthening Surveillance and Reporting Systems														
Establish a nationwide rabies surveillance network	- Percentage of regions/districts with active surveillance units. - Timeliness of reporting - Proportion of reports with complete and accurate information.												100,000	MAI, MAIF, MPHP, FAO
Develop standardized reporting forms	- Number of standardized forms developed and adopted across the network. - Percentage of reports using the standardized forms.												200,000	MAI, MAIF, MPHP, FAO
Utilize electronic data management systems	- Number of users trained and actively using the system. - Data completeness and accuracy within the system. - Integration with other relevant healthcare and animal health systems.												200,000	MAI, MAIF, MPHP, FAO
Conduct regular data analysis	- Frequency of data analysis reports on rabies trends, risk areas, and vaccine coverage. - Quality and timeliness of analysis reports, based on pre-defined criteria. - Use of data analysis to inform program planning and resource allocation.												200,000	MAI, MAIF, MPHP, FAO
Disseminate surveillance data	- Availability of data summaries and reports for stakeholders at different levels (national, regional, local).												100,000	MAI, MAIF, MPHP, FAO

	- Use of various communication channels to share data and raise awareness. - Level of understanding and utilization of data among stakeholders.													
Mass Vaccination Campaigns														
Develop a comprehensive vaccination plan	- Percentage of dogs and other target animals vaccinated in each region/district. - Cost-effectiveness of the vaccination program.												100,000	MAI, MAIF, MPHP, FAO
Procure high-quality rabies vaccines	- Compliance with international standards for vaccine quality and potency. - Adequate and reliable supply of vaccines throughout the year. - Efficient vaccine storage and distribution system.												1,000,000	MAI, MAIF, MPHP, FAO
Mobilize veterinary teams and community volunteers	- Number of trained and active veterinary personnel and volunteers												600,000	MAI, MAIF, MPHP, FAO
Implement incentives and outreach programs	- Increase in awareness and knowledge about rabies among targeted communities.												300,000	MAI, MAIF, MPHP, FAO
Monitor vaccination campaign effectiveness	- Seroprevalence (presence of rabies antibodies) in vaccinated animals. - Reduction in rabies cases reported after vaccination campaigns.												200,000	MAI, MAIF, MPHP, FAO
Education and Awareness Programs														
Develop targeted educational materials	- Availability of educational materials in different and formats for various audiences. - Accuracy and clarity of information presented in the materials.												100,000	MAI, MAIF, MPHP, FAO
Utilize diverse communication channels	- Types of communication channels used												100,000	MAI, MAIF, MPHP, FAO

	- Reach and engagement with target audiences through each channel.													
Conduct workshops and training programs	- Number of personnel trained on rabies prevention, diagnosis, and control. - Knowledge and skills gained by participants after training.												500,000	Universities, Research Organizations
Engage with community leaders and religious organizations	- Number and level of engagement of community leaders and religious organizations in rabies prevention activities. - Development of sustainable partnerships for rabies prevention efforts.												100,000	MAI, MAIF, MPHP, FAO
Collaborate with schools and educational institutions	- Integration of rabies education into school curriculum or extracurricular activities. - Number of students reached and level of knowledge gained through school-based programs. - Change in awareness and attitudes towards rabies among students and their families.												200,000	MAI, MAIF, MPHP, FAO
Strengthening Animal Control Measures														
Implement stray animal management programs	- Number of stray animals captured and managed - Reduction in stray animal populations in targeted areas.												100,000	MAI, MAIF, MPHP, FAO
Enforce animal registration and vaccination requirements	- Percentage of dog and other animals registered in each region/district.												100,000	MAI, MAIF, MPHP, FAO
Implement regulations on animal importation and movement	- Number of animals imported and exported with valid health certificates and rabies vaccination records. - Effectiveness of border controls in preventing the entry of rabies-infected animals.												50,000	MAI, MAIF, MPHP, FAO

	- Compliance with international standards for animal movement.													
Establish animal shelters and foster care programs	- The impact on animal welfare and potential reduction in zoonosis risk.												200,000	MAI, MAIF, MPHP, FAO
Conduct regular inspections of animal shelters and breeding facilities	- Regular monitoring of animal welfare and compliance with regulations. - Reduction in disease outbreaks within inspected facilities												50,000	MAI, MAIF, MPHP, FAO
Research and Development														
Support research on rabies epidemiology and transmission dynamics	- Number of research projects funded or supported - Rabies control strategies based on research findings												300,000	MAI, MAIF, MPHP, FAO, Universities, Research Organizations
Encourage collaboration between researchers	- Number of collaborative research projects - Jointly published research papers or reports												50,000	Universities, Research Organizations
Conduct studies on rabies risk factors and prevention strategies	- Number of studies conducted on rabies risk factors in specific populations - Cost-effectiveness of different rabies prevention approaches - Development of improved rabies prevention guidelines based on study findings												50,000	Universities, Research Organizations
Develop innovative rabies prevention approaches	- Number of new rabies prevention methods developed and tested - Cost-benefit analysis of new approaches compared to existing strategies - Pilot implementation and evaluation of innovative approaches												50,000	Universities, Research Organizations
Promote the development of new diagnostic tools and technologies	- Number of new diagnostic tools developed and validated												50,000	Universities, Research Organizations

	- Cost-effectiveness and ease of use of new diagnostic tools - Increased rabies case detection and reporting rates after incorporating new diagnostics													

Strategic Pillar 3: Prevent, detect and respond to health issues at the interfaces between humans, animals and the environment														
Outcome: establish a collaborative, multi-disciplinary approach to proactively manage health risks and diseases at the humans- animals-environment interface														
Programme 3.1: Quarantine and Movement Control														
Strengthening infrastructure and resources														
Build or upgrade existing facilities that can effectively quarantine and isolate animals to prevent the spread of diseases	- Track the cost of building or upgrading facilities, including materials, labor, and permits - Monitor ongoing costs associated with facility maintenance, staff salaries, animal care, and waste disposal - Ensure access to appropriate food, water, enrichment, and veterinary care												3,000,000	MAI, MAIF FAO, ICRC
Provide comprehensive training programs for veterinarians, animal health professionals, and relevant stakeholders on quarantine protocols, disease prevention, and control measures	- Trained professionals apply best practices and updated protocols in their work. - Number and types of participants engaged in training programs. - Surveys to gauge participants' satisfaction with the training content and its relevance.												2,000,000	MAI, MAIF FAO, ICRC
Enhancing awareness and education														
Conduct public awareness campaigns to educate livestock keepers, farmers, traders, and the general public about the importance of quarantine and movement control measures	- Measure public understanding of quarantine and movement control measures through surveys or knowledge tests. - Number of people exposed to campaign materials and their level of engagement												1,000,000	MAI, MAIF FAO, ICRC

	- Surveys to assess participants' recall of campaign messages and their perceived effectiveness.													
Strengthening legislation and enforcement														
Review and update existing laws and regulations related to animal health, quarantine, and movement control	- Number of revised laws and regulations - Adherence to revised regulations by various entities involved in animal health. - Effectiveness of enforcement mechanisms - Impact of updated regulations on reducing disease transmission and outbreak frequency.												1,500,000	MAI, MAIF FAO, ICRC
International collaboration and partnerships														
Facilitate coordination and collaboration among various entities involved in animal health	- Frequency and quality of communication - Joint initiatives and activities												1,500,000	MAI, MAIF FAO, ICRC
Seek international support and collaboration to improve infrastructure and resources for control measures	- The amount and types of international support received for infrastructure and control measures. - Joint research and development												1,000,000	MAI, MAIF FAO, ICRC
Programme 3.2: Standards for Veterinary Facilities and Equipment														
Collaborating and coordinating														
Ensure a steady supply of quality vaccines for the identified priority diseases	- Percentage of animals in the target population vaccinated against priority diseases. - Available quantity of vaccines to cover potential outbreaks or delays in supply. - Timeliness and consistency of deliveries from vaccine manufacturers.												1,500,000	MAI, MAIF FAO, ICRC
Improve the animal health infrastructure, including cold chain	- Percentage of storage and transportation facilities equipped												1,000,000	MAI, MAIF FAO, ICRC

facilities to store and transport vaccines effectively	with proper temperature control for vaccines. - Availability of equipment and supplies - Timely repairs and upgrades to cold chain facilities and equipment. - Budget allocation for expanding cold chain capacity and improving facilities.													
Establish partnerships with reputable vaccine manufacturers or international organizations to avoid vaccine shortages	- Number and type of partnerships - Joint projects and initiatives - Funds secured through partnerships for vaccine purchases, infrastructure development, and training programs.												750,000	MAI, MAIF FAO, ICRC
Foster collaboration between national and regional animal health agencies, research institutes, and international organizations to share knowledge, expertise, and resources in prioritizing and eradicating animal diseases through vaccination	- Frequency and effectiveness of communication - Joint disease control strategies - Participation in workshops, conferences, and knowledge exchange platforms. - Resource sharing and pooling												500,000	MAI, MAIF FAO, ICRC
Raising awareness among stakeholders														
Conduct public awareness campaigns to educate livestock owners, farmers, and animal handlers about the importance of vaccination, disease prevention, and early detection	- Number of people reached through awareness campaigns and their level of understanding of animal vaccination. - Increase in vaccination rates and adoption of preventive measures												500,000	MAI, MAIF FAO, ICRC
Providing incentives to veterinary professionals														
Provide training programs to veterinarians and animal health workers on vaccination techniques, disease and AMR diagnosis, surveillance, and reporting	- Number of trained veterinarians and animal health workers - Increased accuracy of diagnoses, timely reporting of outbreaks, and effective vaccination practices.												750,000	MAI, MAIF FAO, ICRC
Programme 3.3: Biosecurity measures for disease prevention and control														

Strengthening veterinary services															
Establish a reporting system to ensure timely communication of disease outbreaks and other relevant information	- Percentage of disease outbreaks reported within specified timeframe (e.g., 24 hours) - Percentage of reports confirmed to be accurate by investigations - Percentage of reports containing all necessary information (e.g., location, species, symptoms) - Percentage of reports with valid and usable data for analysis													1,000,000	MAI, MAIF FAO, WOAH, WHO
Implement strict quarantine measures for imported animals, animal products, and equipment	- Percentage of animals/products meeting quarantine requirements - Percentage of illegal/non-compliant animals/products identified and stopped - Average length of time animals/products are held in quarantine - Number of animals escaping quarantine per year													1,500,000	MAI, MAIF FAO, WOAH, WHO
Develop and enforce clear regulations and biosecurity standards for the animal health sector	- Number of established regulations and standards - Clarity and comprehensiveness of regulations - Level of awareness and understanding of regulations among stakeholders													1,000,000	MAI, MAIF FAO, WOAH, WHO
Establish a system for animal identification and traceability to track and monitor the movement of animals	- Percentage of animals identified and registered - Accuracy of identification tags/devices - Percentage of animals successfully tracked back to their origins during an outbreak													1,500,000	MAI, MAIF FAO, WOAH, WHO
Collaborating and international support															
Foster collaboration between different agencies, both national and international, involved in animal health	- Frequency and effectiveness of communication channels - Joint disease surveillance activities													1,500,000	MAI, MAIF FAO, WOAH, WHO

to enhance disease surveillance, response, and coordination	- Timeliness and effectiveness of joint response efforts													
Awareness and education campaigns														
Launch public awareness campaigns to educate the general public about the importance of biosecurity in disease prevention and control. Emphasize the role of individual responsibility in maintaining biosecurity measures	- Percentage of target audience reached and level of interaction with campaign materials - Increase in public understanding of biosecurity concepts and practices after campaign exposure - Percentage of individuals adopting biosecurity measures due to campaign influence												500,000	MAI, MAIF FAO, WOAH, WHO
Conduct training programs for farmers, veterinarians, and other stakeholders to raise awareness about biosecurity measures and best practices	- Number of stakeholders trained - Level of learning and skill development - Integration of biosecurity measures into stakeholder activities												1,000,000	MAI, MAIF FAO, WOAH, WHO
Programme 3.4: Early Warning Systems														
Integration/update the technologies and data management systems														
Regular reporting, data collection, analysis, and the establishment of effective early warning systems to identify potential threats	- Percentage of reporting compliance - Timeliness of data availability - Number of potential threats identified through early warning systems - Average time from threat detection to initiating mitigation actions.												3,000,000	MAI, MAIF FAO, WOAH, WHO
Establish a robust disease surveillance system to monitor livestock diseases in different regions	- Disease detection rate - Coverage of the surveillance system - Timely identification of outbreaks. - Reduced disease prevalence												2,000,000	MAI, MAIF FAO, WOAH, WHO
Gather data on livestock populations, animal movements, and disease prevalence	- Data quality - Frequency of data updates - Insights gained from data analysis on population characteristics,												2,500,000	MAI, MAIF FAO, WOAH, WHO

	movement patterns, and disease distribution.													
Provide training and workshops for veterinary professionals, livestock farmers, and relevant stakeholders on disease identification, reporting, and data collection techniques	- Participant attendance and feedback - Pre- and post-training evaluations to measure learning outcomes. - Increased reporting and data collection accuracy												1,500,000	MAI, MAIF FAO, WOAH, WHO
Develop a comprehensive database or information management system to store and manage collected data efficiently	- Data accessibility and retrieval - Data security and integrity - Frequency and scope of data usage by different stakeholders. - System's effectiveness in facilitating information exchange.												2,000,000	MAI, MAIF FAO, WOAH, WHO
Utilize appropriate statistical and epidemiological techniques to analyze and interpret the collected data	- Accuracy and validity of analysis - Timeliness of analysis - Usefulness of analytical outputs for informing decision-making. - Contribution of data analysis to identifying trends, risk factors, and potential interventions.												1,000,000	MAI, MAIF FAO, WOAH, WHO
Establishment/strengthen effective communication channels and coordination mechanisms among relevant stakeholders														
Develop and regularly update emergency response plans, protocols, and standard operating procedures (SOPs) to handle various animal health emergencies	- Number of times plans were activated - Average time from emergency declaration to initiating response actions. - Effectiveness of interventions - Regular plan updates and testing												1,500,000	MAI, MAIF FAO, WOAH, WHO
Maintain strategic reserves of veterinary drugs, vaccines, and the necessary equipment to respond promptly during emergencies	- Inventory levels of critical drugs, vaccines, and equipment. - Efficiency of resource mobilization and deployment during emergencies. - Improvements in outbreak confirmation and disease identification speed.												1,500,000	MAI, MAIF FAO, WOAH, WHO

Enhance diagnostic capabilities by equipping and strengthening veterinary laboratories	- Average time it takes to reach a definitive diagnosis for animals presented with various symptoms. - Number and types of tests available - Timeliness and effectiveness of interventions based on accurate diagnoses.												1,000,000	MAI, MAIF FAO, WOAH, WHO
Programme 3.5: Epidemiological Investigations														
Strengthening early warning system and information sharing for livestock vector-borne diseases (food safety and AMR)														
Establish a robust surveillance system to monitor to detect animal diseases accurately and timely	- Timeliness of disease detection - Accuracy of diagnoses - Coverage of surveillance												1,000,000	MAI, MAIF FAO, WOAH, WHO
Foster collaboration and coordination among various stakeholders, including government agencies, veterinary services, research institutions, and international organizations	- Frequency and effectiveness of joint planning meetings - Number of joint initiatives or projects - Level of information sharing												500,000	MAI, MAIF FAO, WOAH, WHO
Develop and enforce appropriate legislation and policies related to animal health, disease reporting, import/export regulations, and vaccination programs	- Comprehensiveness of animal health legislation - percentage of farms/markets adhering to regulations. - Timeliness of policy updates												500,000	MAI, MAIF FAO, WOAH, WHO
Raise awareness among livestock owners, farmers, and the general public about the importance of reporting animal diseases, practicing proper biosecurity measures, and following guidelines provided by veterinary authorities	- Increase in disease reporting - Adoption of biosecurity measures - Knowledge of animal health guidelines												300,000	MAI, MAIF FAO, WOAH, WHO
Develop policies and regulations that support the implementation of One Health activities	- Number of policies or regulations developed, enacted, or implemented. - Integration of human, animal, and environmental health considerations - Increased funding or resources allocated to One Health initiatives												200,000	MAI, MAIF FAO, WOAH, WHO

Tackling major diseases including antimicrobial resistance															
Develop a centralized database for collecting, storing, and analyzing animal health data	- Percentage of required data points filled, data validation procedures in place. - Frequency of data analysis and reporting for decision-making. - Regularity of data entry and availability of real-time or near-real-time information.													500,000	MAI, MAIF FAO, WOAH, WHO
Create an emergency response plan for swift actions during disease outbreaks	- Timeliness of activation - Reduction in case numbers, prevention of widespread transmission, control of the outbreak. - Availability of resources, trained personnel, and communication channels outlined in the plan.													300,000	MAI, MAIF FAO, WOAH, WHO
Encourage research initiatives for disease surveillance, diagnostics, and preventive measures	- Number of research projects funded or supported - Development and validation of new tools and technologies - Publications, conferences, and training programs.													500,000	MAI, MAIF FAO, WOAH, WHO
Engage with regional and international organizations, such as the World Organisation for Animal Health (WOAH) and Food and Agriculture Organization (FAO), to benefit from their expertise, resources, and experiences in animal health surveillance and control	- Frequency and depth of engagement with OIE and FAO - Utilization of international expertise and resources - Contributions to global animal health initiatives													200,000	MAI, MAIF FAO, WOAH, WHO
Strengthening the capacities to address complex multidimensional health risks with more resilient health systems															
Conduct training programs for veterinarians, animal health professionals, and relevant stakeholders on epidemiological investigation techniques, disease surveillance, data analysis, and outbreak response	- Number of veterinarians, animal health professionals, and stakeholders trained. - Knowledge and skills gained by participants - Availability of trainers, resources, and continued support for participants.													500,000	MAI, MAIF FAO, WOAH, WHO

Fostering multisectoral coordination/collaboration mechanisms with human medicine, veterinary medicine, and environmental health sciences														
Encourage research initiatives that explore the links between animal health, human health, and environmental factors	- Number of research projects or initiatives exploring these links - Development of integrated disease control strategies - Increased awareness and understanding of One Health principles												600,000	MAI, MAIF FAO, WOAH, WHO
Engage local communities, livestock owners, farmers, and relevant stakeholders in One Health activities	- Level of participation of local communities, livestock owners, and farmers. - Effectiveness of communication and awareness raising strategies - Improved understanding and adoption of One Health practices												750,000	MAI, MAIF FAO, WOAH, WHO
Conduct regular risk assessments to identify potential health threats and evaluate their potential impact on animal health and the livestock industry	- Number of risk assessments conducted per year, per region, or per type of hazard. - Average time taken to complete a risk assessment from its initiation. - Proportion of identified threats that subsequently materialize or demonstrate significant impact. - Ratio of resources invested in risk assessment to avoided economic losses from animal health threats.												450,000	MAI, MAIF FAO, WOAH, WHO
Foster collaboration and coordination among various sectors, including animal health, human health, and environment, to address shared health concerns	- Number of stakeholders engaged. - Frequency and effectiveness of communication - Number and scope of collaborative projects addressing shared health concerns. - Existence and adherence to standardized procedures for One Health interventions. - Increased awareness and understanding of One Health principles												600,000	MAI, MAIF FAO, WOAH, WHO

Enhance the capacity of healthcare professionals, veterinarians, and relevant stakeholders through training programs on One Health principles, zoonotic disease surveillance, outbreak response, and integrated disease control	- Number of individuals trained - Pre- and post-training assessments to measure knowledge acquisition and skill development. - Time to detect and contain zoonotic disease outbreaks. - Proportion of farms or communities implementing One Health-based preventive measures.													600,000	MAI, MAIF FAO, WOAH, WHO
Programme 3.6: Promoting public awareness about the importance of animal health															
Developing educational campaigns															
Develop educational materials such as brochures, pamphlets, posters, and guidelines that provide valuable information on animal health practices, vaccination schedules, disease prevention measures, and treatment protocols	- Number of materials distributed, websites accessed, downloads, views, or social media shares. - Pre- and post-material assessment scores, surveys on understanding of key topics													300,000	MAI, MAIF, FAO, IRC, Universities, Research Organisations, veterinary schools, veterinary professionals
Organize training sessions, workshops, and seminars for livestock farmers, and community animal health workers	- Number of attendees, frequency of sessions, diversity of participants (farmers, workers, etc.). - Pre- and post-training assessments of knowledge and competency.													500,000	MAI, MAIF, FAO, IRC
Facilitate community engagement by organizing interactive sessions, participatory workshops, and dialogue forums	- Number of attendees, frequency of sessions, diversity of participants (communities, stakeholders). - Active participation in discussions, asking questions, sharing experiences. - Pre- and post-engagement surveys on knowledge of animal health issues. - Formation of committees, implementation of collaborative initiatives, behavior change.													200,000	MAI, MAIF, FAO, IRC

Encourage open discussions to understand community perceptions, concerns, and suggestions related to animal health	- Number of policies influenced, funding allocated, resources provided. - Media coverage, public understanding of animal health priorities. - Access to services, improved working conditions for local vets.													MAI, MAIF, FAO, IRC
Establish a system to monitor and evaluate the effectiveness of educational materials, campaigns, and training programs	- Percentage of people who finish the entire program or campaign - Pre- and post-assessments, quizzes, or skills tests - Shifts in attitudes or beliefs related to the objectives												100,000	MAI, MAIF, FAO, University, Research Organisations, veterinary schools, veterinary professionals
Empowering local veterinarians														
Conduct workshops, seminars, and training sessions for local veterinarians to enhance their knowledge and skills	- Number of vets attending workshops, seminars, and network meetings. - Pre- and post-training assessments, improved diagnostic skills, adoption of new techniques. - Active participation in network activities, knowledge sharing, joint projects. - Improved access to quality veterinary services, reduced animal mortality and morbidity.												400,000	MAI, MAIF, FAO, IRC, veterinary professionals
Establish community-based networks where local veterinarians can collaborate, share knowledge, and collectively address animal health challenges	- Number of local veterinarians participating in the network. - Frequency of knowledge-sharing events (meetings, workshops). - Number of collaborative projects addressing animal health challenges. - Improvement in awareness and access to veterinary services within communities.												100,000	MAI, MAIF, FAO, IRC, Universities, Research Organisations, veterinary schools, veterinary professionals

Foster partnerships between local veterinarians and private businesses, such as livestock farmers, agribusinesses, or pharmaceutical companies	- Number of partnerships established with livestock farmers, agribusinesses, or pharmaceutical companies. - Increased investment in animal health initiatives from private partners. - Development of new animal health products or services through partnerships. - Improved access to inputs (vaccines, medicines) for livestock farmers.												200,000	MAI, MAIF
Advocate for the development and implementation of policies that prioritize animal health and support local veterinarians	- Number of policies developed or implemented that prioritize animal health and support veterinarians. - Increased funding allocated to animal health programs from government agencies. - Strengthened legal frameworks for animal welfare and disease control. - Media coverage of advocacy efforts and policy changes												100,000	MAI, MAIF, FAO
Engage with policymakers to ensure that animal health initiatives receive adequate funding, resources, and recognition	- Number of meetings or interactions with policymakers on animal health funding and resources. - Increased budget allocation for animal health initiatives.												100,000	MAI, MAIF, FAO
Establish systems for ongoing professional development opportunities for local veterinarians	- Number of veterinarians participating in training programs or workshops. - Range of topics covered in professional development opportunities. - Improved knowledge and skills of veterinarians as measured by tests or surveys. - Feedback from veterinarians on the quality and relevance of training programs.												100,000	MAI, MAIF

Encouraging community participation															
Organize awareness events in local communities, including seminars, exhibitions, and interactive sessions	- Number of people attending seminars, exhibitions, and interactive sessions. - Changes in behavior related to animal health practices (vaccination, prevention measures).													100,000	MAI, MAIF
Developing educational materials and resources															
Develop educational materials such as brochures, pamphlets, posters, and guidelines that provide valuable information on animal health practices, vaccination schedules, disease prevention measures, and treatment protocols	- Number of brochures, pamphlets, posters, and guidelines produced. - Distribution channels and reach of educational materials (veterinarians, farmers, communities).													200,000	MAI, MAIF, FAO, IRC
Organize training sessions, workshops, and seminars for livestock farmers, and community animal health workers	- Number of farmers and community workers attending training sessions and workshops. - Improvement in livestock health outcomes in communities													150,000	MAI, MAIF, FAO, IRC, Universities, Research Organisations, veterinary professionals
Facilitate community engagement by organizing interactive sessions, participatory workshops, and dialogue forums	- Identification of key community concerns and suggestions related to animal health. - Development of programs or initiatives based on community input													100,000	MAI, MAIF, FAO, IRC, Universities, Research Organisations, veterinary professionals
Encourage open discussions to understand community perceptions, concerns, and suggestions related to animal health	- Number of interactive sessions, participatory workshops, and dialogue forums held. - Level of participation and engagement from community members.														MAI, MAIF, FAO, IRC, Universities, Research Organisations, veterinary professionals
Establish a system to monitor and evaluate the effectiveness of educational materials, campaigns, and training programs	- Established system for tracking program activities and outcomes.													150,000	MAI, MAIF

	- Regular data collection and analysis to assess program effectiveness. - Use of data to inform program improvements and decision-making. - Clear reporting of program results to stakeholders and funders.													
Leveraging technology for outreach														
Create a user-friendly and informative website that serves as a hub for educational resources, news updates, and community engagement	- Number of visitors to the website. - Regular updates and expansion of website content to meet user needs.												100,000	MAI, MAIF
Conduct webinars and online workshops on relevant topics of interest to the animal health sector	- Number of participants in webinars and online workshops. - Use of recordings and materials to reach a wider audience.												50,000	MAI, MAIF, Universities, Research Organisations, veterinary professionals
Establishing networking platforms														
Foster partnerships in the field of animal health	- Number of new partnerships established with other organizations working in animal health. - Increased access to resources and expertise through partnerships. - Joint advocacy efforts and initiatives to improve animal health outcomes.												150,000	MAI, MAIF

Strategic Pillar 4: Boost emergency readiness for key animal diseases and livestock calamities caused by climate change
Outcome: enhance the preparedness and response strategies for animal health emergencies, particularly those exacerbated by climate change, through improved coordination, communication and investment in veterinary services and disease surveillance
Programme 4.1: Disease Notification and Reporting
Establishing a structured and administered surveillance system

Develop a comprehensive disease surveillance system that includes early warning mechanisms, trained personnel, and a network of reporting entities such as veterinarians, farmers, and livestock traders	- Number of early warning mechanisms in place - Percentage of trained personnel - Percentage of relevant stakeholders (veterinarians, farmers, traders) actively reporting disease events.													500,000	MAI, MAIF, FAO
Conduct training programs to enhance the knowledge and skills of veterinary professionals and relevant stakeholders in disease recognition, reporting, and response protocols	- Pre- and post-training assessments to measure the increase in knowledge and skills related to disease recognition, reporting, and response. - Number of individuals trained													300,000	MAI, MAIF, FAO, Universities, Research Organisations, veterinary professionals
Develop a centralized platform or database where all disease reports can be submitted	- Average time taken for disease reports to be submitted from the point of detection. - Percentage of reports with full and accurate information on disease type, location, date, and affected animals. - Ease of use and access to the reporting platform for different stakeholders.													200,000	MAI, MAIF
Regularly analyze the collected disease data to identify patterns, trends, and hotspots	- Time taken to analyze collected data and identify patterns, trends, and hotspots. - Accuracy of identified patterns and hotspots through further investigation and verification. - Frequency and reach of sharing disease intelligence with relevant stakeholders for timely response.													150,000	MAI, MAIF
Regularly assess and evaluate the effectiveness of the disease notification and reporting activities	- Number of disease reports submitted per unit of time. - Percentage of reported cases that undergo thorough investigation and confirmation. - Time taken to initiate control measures after disease detection and confirmation.													100,000	MAI, MAIF

Raising awareness among farmers and livestock owners about the importance of disease reporting														
Establish effective communication channels between veterinary authorities, field veterinarians, and stakeholders involved in the animal health sector	- Frequency and effectiveness of communication channels used to reach relevant stakeholders with disease information and updates.												150,000	MAI, MAIF
Conduct public awareness campaigns to educate animal owners, farmers, and the public about the importance of disease notification and reporting	- Percentage of target population reached by awareness campaigns and their understanding of disease notification and reporting. - Impact of campaigns on the willingness of animal owners and farmers to report disease events.												200,000	MAI, MAIF
Promoting disease management and control														
Upgrade local veterinary diagnostic laboratories, equip them with necessary tools and equipment, and provide training to staff on proper sample collection, handling, and testing	- Percentage of laboratories equipped with essential diagnostic equipment for common and priority diseases. - Percentage of lab staff trained on proper sample collection, handling, and testing procedures. - Time taken for laboratories to deliver test results for submitted samples.												500,000	MAI, MAIF, FAO
Develop and enforce clear policies, guidelines, and regulations that mandate disease notification and reporting in the national animal health sector	- Clarity and comprehensiveness of policies covering disease notification and reporting requirements for different stakeholders. - Level of enforcement and compliance with established policies and regulations. - Frequency and responsiveness of policy updates to address emerging disease threats or reporting gaps.												300,000	MAI, MAIF, FAO
Foster collaborations and partnerships with international organizations, neighboring countries, and donors to share information, resources, and	- Number of active collaborations - Frequency and effectiveness of knowledge and resource sharing												400,000	MAI, MAIF

technical expertise in disease notification and reporting systems	- Number and impact of joint activities and initiatives undertaken through collaborations and partnerships.													
Programme 4.2: Contingency planning in animal health														
Strengthening surveillance and early warning systems														
Regular reporting, data collection, analysis, and the establishment of effective early warning systems to identify potential threats	- Percentage of reports submitted within required timeframe. - Percentage of reports with required data points filled. - Number of reports with verified errors. - Percentage of actual threats identified by the system. - Percentage of non-threats correctly identified by the system.												2,000,000	MAI, MAIF
Enhancing emergency response capacity														
Develop and regularly update emergency response plans, protocols, and standard operating procedures (SOPs) to handle various animal health emergencies	- Number of times plans and procedures updated in a specified timeframe. - Percentage of potential emergencies covered by specific plans. - Access to plans and procedures by relevant personnel. - Percentage of personnel trained on the plans and procedures. - Number and frequency of drills conducted to test the plans.												1,500,000	MAI, MAIF
Maintain strategic reserves of veterinary drugs, vaccines, and the necessary equipment to respond promptly during emergencies	- Percentage of essential drugs, vaccines, and equipment readily available. - Percentage of items within expiry date. - Time taken to distribute supplies to affected areas. - Cost-effectiveness of maintaining and replenishing reserves.												2,500,000	MAI, MAIF

Promoting sustainable practices															
Implement policies and regulations that promote sustainable animal health practices, responsible livestock management, and contingency planning for potential disease outbreaks	- Incidence of key animal diseases within regions - Use of sustainable and locally sourced feedstuffs, like crop residues or legumes, to reduce reliance on imported grains. - Adoption of breeding practices that prioritize animal health, welfare, and resource efficiency. - Food waste within livestock production systems, including at processing and distribution stages. - Availability and affordability of animal-source protein for local populations. - Impact of policies on vulnerable groups involved in livestock production.												1,000,000	MAI, MAIF
Develop comprehensive contingency plans that outline steps to be taken during disease outbreaks	- Percentage of farmers/communities implementing recommended practices. - Level of participation by local stakeholders in plan development and implementation. - Percentage of potential risks addressed in the plan. - Ease of understanding and executing the plan by diverse actors.												1,500,000	MAI, MAIF
Involve local communities, livestock owners, herders in decision-making processes for the success and sustainability of the contingency plans	- Number of community members participating in decision-making on animal health and vector control policies. - Number of community-based animal health workers trained and active supporting animal health efforts. - Successful implementation of community-led disease prevention												500,000	MAI, MAIF

	or livestock management programs.													
Promoting collaboration and coordination														
Foster partnerships to gain support, technical expertise, and resources in response to animal health emergencies	- Number and type of partnerships - Amount of funding, expertise, or other resources secured through partnerships. - Frequency and effectiveness of communication among stakeholders. - Number and success of collaborative initiatives between partners. - Coverage of animal health issues and response efforts in national and international media.												1,000,000	MAI, MAIF
Foster effective communication and coordination among relevant national and international stakeholders	- Frequency and accuracy of disease outbreak reports, public awareness campaigns, and communication with stakeholders. - Number of active partnerships - Regularity and effectiveness of inter-agency meetings and information sharing platforms. - Number of collaborative projects or initiatives addressing animal health and vector control.												500,000	MAI, MAIF
Strengthening vector control measures														
Conduct a thorough assessment of the existing vector control measures and the challenges faced in controlling the spread of vector-borne diseases in the national animal health sector	- Coverage and effectiveness of existing control measures - Bottlenecks and gaps in current control strategies. - Diversity of control methods employed (biological, chemical, environmental, etc.). - Number and scope of ongoing research projects on vector control technologies. - Integration of research findings into practical applications.												1,000,000	MAI, MAIF, FAO, University, Research Organisations

Adopt an integrated approach to vector management, combining various control methods	- Percentage of animals vaccinated against target diseases. - Number of farms adopting recommended biosecurity measures (isolation, disinfection, etc.). - Amount of antibiotics used in livestock per unit of production. - Mortality rates, disease prevalence, body condition score. - Area of land under sustainable grazing management. - Percentage of feed sourced from local producers.												1,500,000	MAI, MAIF, FAO, University, Research Organisations
Encourage research and innovation in vector control methods and technologies	- Number of community members participating in decision-making on animal health and vector control policies. - Implementation of community-led disease prevention or livestock management programs.												1,000,000	MAI, MAIF, FAO, University, Research Organisations
Support studies on vector behavior, resistance patterns, and emerging vector-borne diseases to guide the development of effective control strategies	- Publication of research on vector feeding behaviors, breeding patterns, and habitat preferences. - Early detection and characterization of new or previously unknown diseases transmitted by vectors. - Tools for identifying and controlling newly discovered vector-borne diseases.												500,000	MAI, MAIF, FAO, University, Research Organisations
Allocate sufficient financial resources to support the implementation of vector control measures and the contingency plan	- Proportion of national budget allocated to animal health emergency preparedness and response. - Efficiency and transparency in fund management for specific program activities. - Mechanisms for securing long-term financial support.												1,500,000	MAI, MAIF, FAO, University, Research Organisations

	- Ratio of benefits (disease control, animal welfare) to costs of initiatives.													

Strategic Pillar 5: Establish long-term frameworks for prompt and consistent coordination														
Outcome: Create systematic and efficient mechanisms for coordination and cooperation among stakeholders involved in animal health management														
Programme 5.1: Funding of veterinary services and related institutions														
Ensuring sufficient funding														
Allocate a specific budget for veterinary services and related institutions (staffing, infrastructure, and research and development efforts)	- Number of animals and communities receiving services funded by the budget. - Number of trained veterinarians and veterinary technicians, as well as the availability of equipment and infrastructure. - Number of research projects funded, publications, and innovations developed or applied.												10,500,000	MAI, MAIF FAO, WB, University, Research Private Sector
Partner with government agencies														
Collaborate with government agencies for joint research, capacity building, and the development of regulatory frameworks	- Number of joint research projects undertaken - Number of training programs, workshops, and other capacity-building activities conducted in collaboration with government agencies. - Progress in developing and implementing animal health and welfare regulations with government partners. - Level of participation and commitment from government agencies in joint initiatives. - Impact of collaborative efforts on changes to animal health and welfare policies.												7,000,000	MAI, MAIF FAO, WB, University, Research Private Sector
Collaborating with private organizations such as animal welfare organizations and veterinary associations														

Support joint projects, organizing conferences and workshops, and facilitating knowledge exchange between different stakeholders	- Number of joint projects supported. - Effectiveness of communication channels and platforms for sharing information and best practices. - Long-term viability of joint initiatives and partnerships.												8,750,000	MAI, MAIF FAO, WB, University, Research Private Sector
Raising public awareness about the importance of animal health care														
Develop multimedia campaigns, organizing educational events, and creating informative materials aimed at increasing awareness about animal health and welfare	- Number of people reached through campaigns, events, and materials. - Level of media attention and public engagement generated by your outreach efforts. - Increases in requests for services or resources following educational campaigns.												8,750,000	MAI, MAIF FAO, WB, University, Research Private Sector
Programme 5.2: Investing in scientific research and development to enhance understanding of animal diseases														
Increasing funding for research														
Veterinary institutions apply for grants and funding opportunities provided by national and international agencies	- Number and value of grants and funding opportunities secured. - Success rate in grant applications - Diversity of funding sources												15,000,000	MAI, MAIF FAO, WB, University, Research Private Sector
Utilize for grants, scholarships, and research projects that focus on understanding the causes, prevention, and treatment of animal diseases	- Number and quality of publications in reputable scientific journals - Citations of published research - Number of completed research projects on time and within budget. - Development of new diagnostic tools, vaccines, or treatment methods												**15**,000,000	MAI, MAIF FAO, WB, University, Research Private Sector
Promoting collaboration and knowledge exchange														
Engaging private sector companies and organizations	- Number and value of partnerships with private companies.												7,500,000	MAI, MAIF FAO, WB, University,

	- Joint research projects with private companies. - Funding received from private companies													Research Private Sector
Encouraging researchers to publish their findings in reputable scientific journals and sharing knowledge through conferences, symposiums, and online platforms can support the dissemination of research outcomes	- Number of presentations at conferences and symposiums - Attendance at outreach events and workshops - Website traffic and engagement with online platforms - Media coverage of research findings												7,500,000	MAI, MAIF FAO, WB, University, Research Private Sector
Promoting interdisciplinary research among veterinary and medical scientists														
Encourage community involvement and contributions	- Number of community partners involved in research projects. - Level of community input and participation in research design and implementation - Impact of research on improving animal health and welfare in communities												5,000,000	MAI, MAIF FAO, WB, University, Research Private Sector
Utilized for establishing dedicated research centers that facilitate joint projects, supporting interdisciplinary research fellowships, and incentivizing researchers	- Utilization rate of dedicated research centers - Number of interdisciplinary research fellowships awarded. - Effectiveness of incentive programs in attracting and retaining talented researchers												5,000,000	MAI, MAIF FAO, WB, University, Research Private Sector
Raising public awareness about the importance of scientific research and development related to animal diseases														
Utilize for the development of educational campaigns, public lectures, and interactive workshops that engage communities	- Number of participants in educational campaigns, public lectures, and workshops - Levels of knowledge and awareness gained by participants. - Engagement and interaction on digital media platforms												2,500,000	MAI, MAIF FAO, WB, University, Research Private Sector
Invest in digital media platforms to amplify the reach of awareness	- Percentage of users who interacted with the content (likes, shares, comments, etc.).												2,500,000	MAI, MAIF FAO, WB, University,

initiatives, ensuring that accurate information reaches a wider audience	- Website traffic. - Audience research													Research Private Sector