BHUTAN BIOSECURITY & FOOD SAFETY STRATEGY & ACTION PLAN (2021-2028)

June 2021

Bhutan Agriculture and Food Regulatory Authority(BAFRA)
Ministry of Agriculture and Forests
Royal Government of Bhutan
June 2021

Bhutan Biosecurity & Food Safety Strategy & Action Plan (2021-2028)

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Published by the Bhutan Agriculture and Food Regulatory Authority (BAFRA)

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Funding Support:

Royal Government of Bhutan

Food and Agriculture Organization of the United Nations

Foreword

This "Bhutan Biosecurity and Food Safety Strategy and Action Plan 2021-2028" builds on the strong foundation of Bhutan Agriculture & Food regulatory Authority's current activities and sets out the strategic directions and actions required over the next seven years in managing the ongoing and future biosecurity and food safety challenges.

Globally, all countries including small land locked countries like Bhutan is vulnerable to increasing biosecurity risks from introduction of a range of pests and diseases with subsequent adverse impacts. Bhutan therefore pursues that our biosecurity systems are pragmatic and resilient based on science and risk analysis frameworks.

Achieving effective biosecurity requires several actions and measures across a continuum of activities. However, the challenge is to invest in activities that provide the optimum return on that investment, linked to the greatest reduction in risks. Therefore, the focus on risk and return is a central theme of this Biosecurity Strategy and Action Plan guided by strategic principles. This strategy and action plan adopts the generalized invasion curve model for the biosecurity system that highlights the inherent principles that prevention, surveillance for early detection and preparedness for astute interventions that provides the best return on investment in biosecurity.

No single agency can manage a country's biosecurity issues in isolation, and this strategy and action plan seeks to further strengthen the partnerships and collaborations necessary to effectively manage the biosecurity risks from a holistic perspective. Every individual, community and institutions have some level of shared responsibility – a duty of care - for a nation's biosecurity.

The outcome of this strategy document sets a firm foundation to guide the biosecurity protection, preparedness and service delivery. The participatory approaches applied in this consultative process are a testimony by the various stakeholders of their commitment to contribute to enhance our social, economic and environmental assets.

I am confident that, with the unwavering commitment and support of the government, development partners, and collaboration from all stakeholders including the producers, exporters and importers etc. we can translate our strategic plans into action. Lastly, I congratulate BAFRA for taking the lead in developing such a holistic document to strengthen the biosecurity and food safety systems in the country.

H.E Yeshey Penjor
MINISTER

Foreword

The Bhutan Agriculture & Food Regulatory Authority (BAFRA) under the Ministry of Agriculture & Forests (MoAF) has a major mandate to ensure food safety and integrated Biosecurity system for socio-economic wellbeing and sustainable environment. The MoAF aims to strengthen the Biosecurity system to protect public health and wellbeing, agricultural and environment through the prevention, control and management of biological risk factors

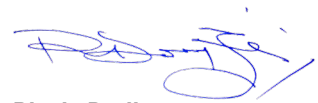
The principles of biosecurity are therefore protection of the human health and wellbeing, the economy, the community and the environment from the negative impacts of animal and plant pests, diseases and invasive alien species and from unsafe food. I am glad to note that BAFRA and other stakeholder's have taken proactive approach to develop the Bhutan Biosecurity and Food Safety Strategy and Action Plan 2021- 2028 which is essential to protect the health and happiness of the Bhutanese people, our agriculture on which so many Bhutanese people rely, and our pristine natural environment. Biosecurity supports our sustainable development goals through protection of the natural resource that is the foundation of resilient socio-economic well-being and self-reliant food systems in Bhutan.

This biosecurity strategic and action plan encompasses the three major components of protection: physical security, personnel reliability, and information security. Biosecurity refers to all the measures taken to minimize the risk of infectious diseases caused by viruses, bacteria or other microorganisms entering, emerging, establishing or spreading in a country, potentially harming the population, food security and the economy. The Biosecurity and Food safety Strategy 2021-2028 is thus strongly grounded to science, innovation, evidence-based and people-centric approaches and aims to fulfill the national goal of safe food and ecosystem for the well-being of Bhutanese people.

The implementation of this strategy will need various resources relating to human, financial and physical as well as a conducive and enabling environment. It will therefore be vital for the Ministry to source and secure financial resources to implement the exhaustive list of proposed activities indicated in the strategic document. We are hopeful of the generous support of the government and our development partners to implement these activities.

I look forward to the delivery of next eight years of strategy implementation with BAFRA working closely in partnership with all stakeholders to ensure this strategic plan is a success and the benefits of our unique biosecurity status continue to flow to Bhutan.

Lastly, let me take this opportunity to express my appreciation to all the BAFRA professionals and partners for their inputs in developing this Strategic document.



Rinzin Dorji
HONORABLE SECRETARY

Acknowledgments

The Bhutan Agriculture and Food Regulatory Authority (BAFRA), Ministry of Agriculture and Forests (MoAF) take this opportunity to express our heartfelt gratitude to all the contributors and stakeholders from various departments and agencies for providing their valuable time, effort and commitment in framing this "Bhutan Biosecurity & Food Safety Strategy & Action Plan 2021-2028".
We would like to acknowledge the contributions of:

1. The esteemed members of RNR-GNHC, MoAF for the guidance and advice on this strategy & action plan which was endorsed in the 121st session of the RNR-GNHC meeting held on 15 June 2021.
2. The representatives from the Policy Planning Division, MoAF, Department of Livestock, Department of Agriculture, Department of Forests & Park Services, Department of Agriculture Marketing & Cooperatives, National Biodiversity Center, Department of Public Health, and Food Cooperation of Bhutan Limited for their invaluable cooperation and support rendered to BAFRA during the development and consultation processes.
3. Dr Hugh Millar, Director, Hugh Millar & Associates Pty Ltd & AgInsight Pty Ltd, Victoria, Australia for consultancy services in conducting the situational analysis and gap assessment, and framing the draft strategy and action plan
4. Dr Masami Takeuchi, FAO-RAP for providing technical lead in conducting the situation analysis, gap assessment and conceptualizing the draft strategy and action plan.
5. Dr Yoenten Phuentshok from FAO – RAP, Bangkok for providing support to Dr Masami Takeuchi in conducting situation analysis, gap assessment and framing draft strategy and action plan.
6. The project coordinator at the BAFRA, HQ led by Dr Kinley Penjor with support from Mr. Sonam Dorji N in mobilizing resources, conceptualizing the processes and products, leading the drafting of the strategy and action plan and the compilation of the document.
7. Ms. Phub Dem, Specialist, BAFRA for providing invaluable edits to the strategy & action plan ensuring accuracy, consistency and readability.
8. Food and Agriculture Organization of the United Nations (FAO) for their generous support in funding the project.

I would like to reiterate that besides the contribution of the above contributors, I would like to thank all my BAFRA colleagues and other stakeholders for their valuable contribution in some way or other.

Tashi Samdup (Ph.D)
DIRECTOR GENERAL

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Abbreviations, acronyms, and terminologies

BAFRA	Bhutan Agriculture and Food Regulatory Authority
CAC	Codex Alimentarius Commission
Customs	Department of Revenue and Customs
EIC	Export Inspection Council of India
FAO	Food and Agriculture Organization of the United Nations
GIC	Generalised Invasion Curve
GOI	Government of India
ICP	Integrated Check Point
IHR	International Health Regulations
INFOSAN	International Food Safety Authorities Network
IPPC	International Plant Protection Convention
MoAF	Ministry of Agriculture and Forests
MoH	Ministry of Health
MoU	Memorandum of Understanding
NAP	National Action Plan
NCAH	National Centre for Animal health
NFTL	National Food Testing Laboratory
NPPC	National Plant Protection Centre
NPPO	National Plant Protection Office
OIE	World Organisation for Animal Health
RGOB	Royal Government of Bhutan
SOP	Standard Operating Procedure
WFP	World Food Program (of the United Nations)
ALOP	Acceptable Level Of Protection


BAFRA

Executive Summary

This Bhutan Biosecurity & Food Safety Strategy & Action Plan 2021-2028 is a summation of the remaining 2 years (July 2021-June 2013) of the 12th five-year plan (FYP) and the anticipated 13th FYP (July 2023-June 2028). This strategic action plan builds on the existing foundation of BAFRA's current activities, and attempts to set out the strategies and actions required over the next 7 years to ensure that it is better positioned to address Bhutan's future biosecurity challenges

Biosecurity, encompassing safety of humans, animals, plants and the environment against pests, diseases and other biological factors, is essential for promoting sustainable agriculture, food, nutrition and livelihood security vis-a-vis regional and international trade, and equitable socio-economic development. Various studies have shown that the main drivers for emerging biosecurity concerns are: (i) Movements of people and agricultural goods across countries, (ii) Agricultural intensification, diversification and globalization, (iii) extreme weather events and climate change. Depending on the capacities of the countries, different response has been made to such biosecurity threats.

The Biosecurity Policy of the Kingdom of Bhutan 2010 recognizes the importance of an integrated approach to maintaining Bhutan's biosecurity, and identifies the need to develop a Biosecurity and Food Strategy to guide and implement the activities to enhance biosecurity and food safety in line with the changing Biosecurity risk profile in Bhutan and the region.

A key consideration while developing this biosecurity strategic document has been use of certain underlying principles and the generalized invasion curve (GIC) model. The outcome is therefore the Bhutan Biosecurity & Food Safety Strategy & Action Plan 2021-2028, which aspires for a clear vision and strategy with an integrated biosecurity and food safety system and outlines the following five prioritized goals:

1. Invest in effective prevention and preparedness.
2. Adopt evidence-based solutions and best practices.
3. Create knowledge-sharing systems for early detection and response.
4. Enhance partnership, collaboration and engagement.
5. Make the actions more sustainable and consistent to build resilience.

Under each of these goals, strategic key outcomes, actions and activities for implementation have been developed through consultative process within the BAFRA offices and relevant stakeholders within MoAF and outside. Consultative processes include the use of different participatory tool and meetings.

This Strategic document will serve as a guide and reference document for all concerned stakeholders especially the BAFRA officials involved in planning and implementing interventions efficiently, effectively and professionally. With roles and responsibilities of each division under BAFRA clearly spelt out, it is expected to charter a path for clear responsibility and accountability for implementation by BAFRA.

1. BAFRA: An overview

The Bhutan Agriculture and Food Regulatory Authority (BAFRA) was established in 2000 and is the lead agency responsible to protect Bhutan from biosecurity threats related to plant, animal, food with subsequent effect on human and environmental health. While a certain level of interventions to improve biosecurity has been undertaken, much more needs to be done. BAFRA as the competent authority for biosecurity and food safety in Bhutan, executes its functions under the provisions of the Biosafety Act of Bhutan 2015, Food Act of Bhutan 2005, Livestock Act of Bhutan 2001, Plant Quarantine Act of Bhutan 1993 amongst others. The importance of biosecurity related to plant, animal, food and the consequence on human and environmental health is gaining momentum and therefore there is an urgent need to upscale biosecurity interventions in the near future.

BAFRA's vision is to be a Centre of Excellence on food safety and biosecurity functions in Bhutan. This will be pursued through an "integrated approach" and working on the principle of being astute and pursuing adroitness. We are mindful that biological threats have the potential to kill millions, cost billions in economic losses, and create political and economic instability, whether naturally occurring, accidental, or manmade. Therefore, steps taken by the country towards this will help reduce biological risk and enhance global biosecurity. Therefore, a concerted national level effort by Bhutan will also have a cascading effort at the regional and global levels.

[Details of BAFRA as an institution can be assessed at www.bafra.gov.bt]

2. The Need for a Biosecurity and Food Safety Strategy

2.1 Context

The Bhutan Agriculture & Food Regulatory Authority (BAFRA) has made some modest progress in strengthening the national biosecurity and food safety system in the country. However, we need to do more and therefore concerted effort are needed to revitalize the ongoing intertwinedbiosecurity threats and food safety risks. In order to address these concerns, BAFRA has developed the "Bhutan Biosecurity & Food Safety Strategy & Action Plan 2021-2028". This document aims to provide a strategic direction on what needs to be done to strengthen the national biosecurity and food safety system in the next 7 years and how a robust biosecurity system can best be leveraged for the achievement of the "Biosecurity Vision".

The importance of biosecurity has been reflected in the "Constitution of Bhutan, 2008" wherein the Article 5 states that the Royal Government of Bhutan shall "protect, conserve and improve the pristine environment and safeguard the biodiversity of the country".

Third strategy and action plan aims to operationalize biosecurity vision from an integrated biosecurity and food safety system and outlines the following five urgent prioritized actions:

a. Invest in effective prevention and preparedness.
b. Adopt evidence-based solutions and best practices.
c. Create knowledge-sharing systems for early detection and response.
d. Enhance partnership, collaboration and engagement.
e. Make the actions more sustainable and consistent to build resilience.

2.2 Commitment for a common objective: Linkages at national, regional & global levels

This strategic and action document aims to be coherent with the several national, regional and global strategic documents. These are described briefly as follow:

2.2.1 Coherence with National 12th Five Year Plan (FYP)

The 12 FYP (2018-2023) of Bhutan also recognizes the importance of biosecurity wherein one of the National Key Result Areas (NKRA) of the plan is "food and nutrition security", and a program under that NKRA aims to strengthen animal and plant biosecurity and enhance food safety. In addition, the strategy and action plan also contribute in achieving the "Cottage and Small Industry Strategy Action Plan 2019-2023" through improving the market access for agro-based products.

2.2.3 linkages with the RNR Strategy 2040

This strategy and action plan embraces most of the strategies of the "RNR Strategy 2040" document wherein the strategy document can catalyze the progress in achieving the RNR strategy vision 2040 "Sustainable natural resources and self-reliant food systems, contributing to inclusive socio-economic well-being of Bhutanese". These are:

- Strategy 1: Enhance production and quality of RNR commodities
- Strategy 2: Enhance contribution of RNR sector to National economy
- Strategy 3: Accelerate agri-business development and expansion

- Strategy 4: Enabling policies for RNR sector
- Strategy 5: Strengthen research, innovation and dissemination
- Strategy 6: Institute efficient RNR service delivery
- Strategy 9: Diversify sustainable financing for RNR sector development

2.2.3 Congruence with Gross National Happiness Principles

The contribution of biosecurity to Gross National Happiness is well described in the Biosecurity Policy of the Kingdom of Bhutan 2010. The policy mandates BAFRA to protect public health, animal health, plant health and the environment by implementing biosecurity and food safety measures.

This strategy and action plan outlines strategies for protecting the health of the natural environment in achieving the country pursuit of sustainable, productive and resilient natural environment. In particular the strategy is in tandem with the GNH pillar "Conservation of natural environment".

This strategy and action plan is an inclusive approach and has myriads of strategic actions focusing on protecting the agricultural farming system with particular focus in the rural setting thereby promoting the GNH pillar of sustainable and equitable socio-economic development.

The fifth strategic goal of this strategy and action plan is "good governance" which focuses on the accountability, transparency, equality, decentralization, sustainable and consistent approach in managing the biosecurity and food safety threats and is concomitant to the GNH good governance pillar.

2.2.4 Coherence with United Nations Sustainable Development Goals 2030 leveraging

The strategy and action plan aims to explore opportunities for developing solutions anchored around the priority themes of the United Nations Sustainable Development Strategy Goals 2030. Some of the important related sustainable development goals are given as follows:

- SDG 1 – No Poverty: The robust biosecurity and food safety system contributes to the fight against poverty by enhancing production and quality of RNR commodities thereby improving access to food, and supporting healthy communities through employment.
- SDG-2 – Zero Hunger: Strengthening the national biosecurity is pivotal in anchoring sustainable, productive and resilient agriculture farming system for solving long-term hunger challenges and achieving food security.
- SDG 3 -Good Health & wellbeing: The robust biosecurity and food safety system helps in preventing introduction of exotic and emerging pests and diseases thereby protecting the health of human, animal and plant. Food Safety is a critical link between health and nutrition. There can be no health and nutrition without food safety.
- SDG 6 – Clean Water & Sanitation: availability of clean water and sanitation is a pre-requisite for the operation of any food business in the country. The lack of clean water can increase the risk of food being unsafe. Further infectious Food Borne Diseases can be transmitted via water contaminated with pathogenic microorganism or heavy metals.

- SDG 12 – Responsible consumption and production: Sustainable food safety system reduce waste and spoilage of food, and empower consumers to make smart choices in their food consumption. Also, protecting the health of animal and plant ensure that the food production is clean and healthy promoting responsible production and consumption.
- SDG 13 – Climate Action: Protecting the health of plant and environment aids in maintaining carbon sequestration capacities of forest ecosystems. Sustainable food safety systems can reduce this impact by lowering emissions of critical climate-warming gases, including methane and carbon dioxide.
- SDG 14 & 15 - Life below ocean and Life on land: The robust biosecurity system supports healthy terrestrial and aquaculture ecosystems, while also providing food security.
- SDG 17 -Partnership–The robust biosecurity & food safety system requires a systemic and multistakeholder approach, at all levels, by identifying common priorities and challenges, sharing best practices to improve performance, reducing costs, and reaching broad deployment of robust and sustainable biosecurity and food safety system.

2.2.5 Synergies with United Nations Strategic Program on Food System (FAO/WHO)

The UN food system vision is a "healthier, sustainable and equitable food system". The food system encompasses the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g. farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g. energy system, trade system, health system, etc.).

The Bhutan Biosecurity and Food Safety Strategy & Action Plan focuses on supporting the UN food system vision by ensuring food security and nutrition for a growing population, supporting the livelihoods of farmers and others in the food chain, and doing so in an environmentally sustainable way by protecting the health of animal, plant and environment. The strategy document also provides framework and strategic directions in designing and implementing regulatory control systems, policies, legislation and public services related to the health of animal, plant and environment including transboundary animal and plant pests and diseases and antimicrobial resistance (AMR) leveraging the "one health approach".

In addition, the strategy document promotes sustainable agricultural and food value change while facilitating the trade opportunities and access to domestic and global markets (certification and quality schemes) thereby contributing and supporting the UN prioritized program of "trade and agribusiness". Furthermore, this strategy document covers the strategies to support UN global initiative on food loss and waste, and partnership for sustainable food system.

2.3 Major Concerns

Bhutan, an agrarian country with an aspiration towards achieving food self-sufficiency and food security, but it is challenged by pests and diseases outbreak in crops and livestock. New pests emerge on crops

and livestock or known pests become adapted to new crops/livestock because of alien invasion, climatic change, movement of people and agricultural goods and agricultural intensification/diversification.

Given these circumstances, Bhutan cannot remain complacent. Further, Bhutan has been witnessing increasing biosecurity risks due to enhanced trade of plants, animals and their products over the years due to which there have been introduction and spread of exotic pests and diseases. Bhutan has also recorded several outbreaks of transboundary diseases and emerging invasive species over the years, some of which may have been introduced and established through the imports. Emerging biosecurity threats, further aggravated by the SPS and non-tariff barriers to trade, demands effective approaches across the entire biosecurity continuum; pre-border, border and post border to mitigate potentially adverse impacts.

2.4 Ongoing Interventions

Bhutan has made commitments to various international and inter-governmental organizations related to biosecurity and food safety. Bhutan ratified the Cartagena Protocol on Biosafety in August 2002 and enacted the Biosafety Act of Bhutan in 2015. Bhutan has adopted a precautionary policy concerning Genetically Modified Organisms (GMOs) or Living Modified Organisms (LMOs), with the aim to protect, conserve and safeguard the biodiversity in the country and promote organic agriculture. BAFRA is the designated national competent authority for the implementation and enforcement of biosafety-related activities. The biosafety requirements are aimed to protect, conserve and safeguard the biodiversity and to promote the nation's food and nutrition security by safeguarding plants, animals and human health from unintended effect of Genetically Modified Organisms (GMOs).

BAFRA represents in the International Plant Protection Convention (IPPC), Codex Alimentarius Commission (CAC), National Enquiry Point for World Trade Organization-Sanitary and Phytosanitary Agreement (WTO-SPS agreement), International Food Safety Authorities Network (INFOSAN), and the Cartagena Protocol on Biosafety (CPB) to the Convention on Biological Diversity (CBD).

2.5 Need for Integrated Approach to Biosecurity Approaches

Bhutan's pristine but ecologically fragile natural environment, and a reliance on agriculture, make the country vulnerable to the impacts of serious pests and diseases that may enter the country. The climate change, globalization and increase in volume and products traded, tourism and travel, growing volume and speed of online trading, and change in the land use presents new challenges for biosecurity thereby increasing the risk of pests and disease's introduction and establishment in Bhutan. Therefore, managing the threat of such pests and diseases requires continuous engagement and systematic assessment to protect Bhutanese people, animals and plants including environment. In addition, biosecurity incidents and foodborne disease outbreaks continue to test public confidence and resilience of the national biosecurity and food safety system. Therefore, there is a need for an integrated approach to develop inclusive legislations; establish robust regulatory controls; strengthen quarantine and testing infrastructure for inspections, testing and certification; and increase collaboration with the key stakeholders. Bhutan that identifies priority risks and threats across all sectors.

3. The Framework: Bhutan Biosecurity & Food Safety Strategy & Action Plan

The Bhutan Biosecurity and Food Safety strategy framework 2021-2028 is built on the main thrust areas of the past plans and taking into account the current 12th FYP. It also aligns to the overall changing and evolving regional and global biosecurity environment. This strategic framework thus serves as an overarching strategic guide and directions to address the issues related to biosecurity and food safety. Keeping all these in mind the following vision, objectives, shared responsibility has been drawn.

3.1 Vision

To safeguard national biosecurity and ensure safe food for all

Biosecurity is a shared responsibility, and to achieve Bhutan's Biosecurity Vision depends on strong collaborations and partnerships between agencies, between sectors, with key trading partners and international standard setting bodies, and with the Bhutanese community.

Effective Biosecurity minimizes the risks and impacts of exotic pests and diseases, invasive alien species (IAS) and food borne illness on plants, animals and people, thus protecting agricultural production systems, food safety and the natural environment. This is achieved through preventing the entry of emerging pests and diseases, and effectively managing terrestrial and aquatic pests and diseases that are established within Bhutan. In achieving this, biosecurity minimizes negative impacts on Bhutan's economic development and prosperity, and enhances economic activity through facilitating agricultural productivity, exports and tourism.

3.2 Objectives

The strategic objective is to pave a pathway for the overall direction for the ongoing management of biosecurity and food safety in the Kingdom of Bhutan from 2021 to 2028. The strategy and action plan aims to provide a firm foundation to guide the biosecurity prevention, preparedness, containment, service delivery, and collaborations required to protect the economic, environmental and social assets on which Bhutan's prosperity depends. A key objective is to achieve the best return on investment in biosecurity and food safety, and thus optimize the envisioned protections for the funds expended.

The strategic objectives are:

- Communicate a clear vision and build support for a strong and integrated biosecurity and food safety system for Bhutan
- To help meet the BAFRA's obligations under national biosecurity and food safety mandates
- Identify a clear set of biosecurity and food safety goals, outcomes and actions that are objectively aligned with national, regional and international visions.
- To establish adequate and required infrastructure including laboratories, equipment's, quarantine facilities, etc.
- To have robust system for information/data on national biosecurity and food safety

3.3 Bhutan Biosecurity & Food Safety Strategy & Action Plan at Glance

The strategic and action plan covers strategic directions and implementation plan on strengthening national biosecurity and food safety system. A conceptual framework used to develop the strategic document is given in figure 1.

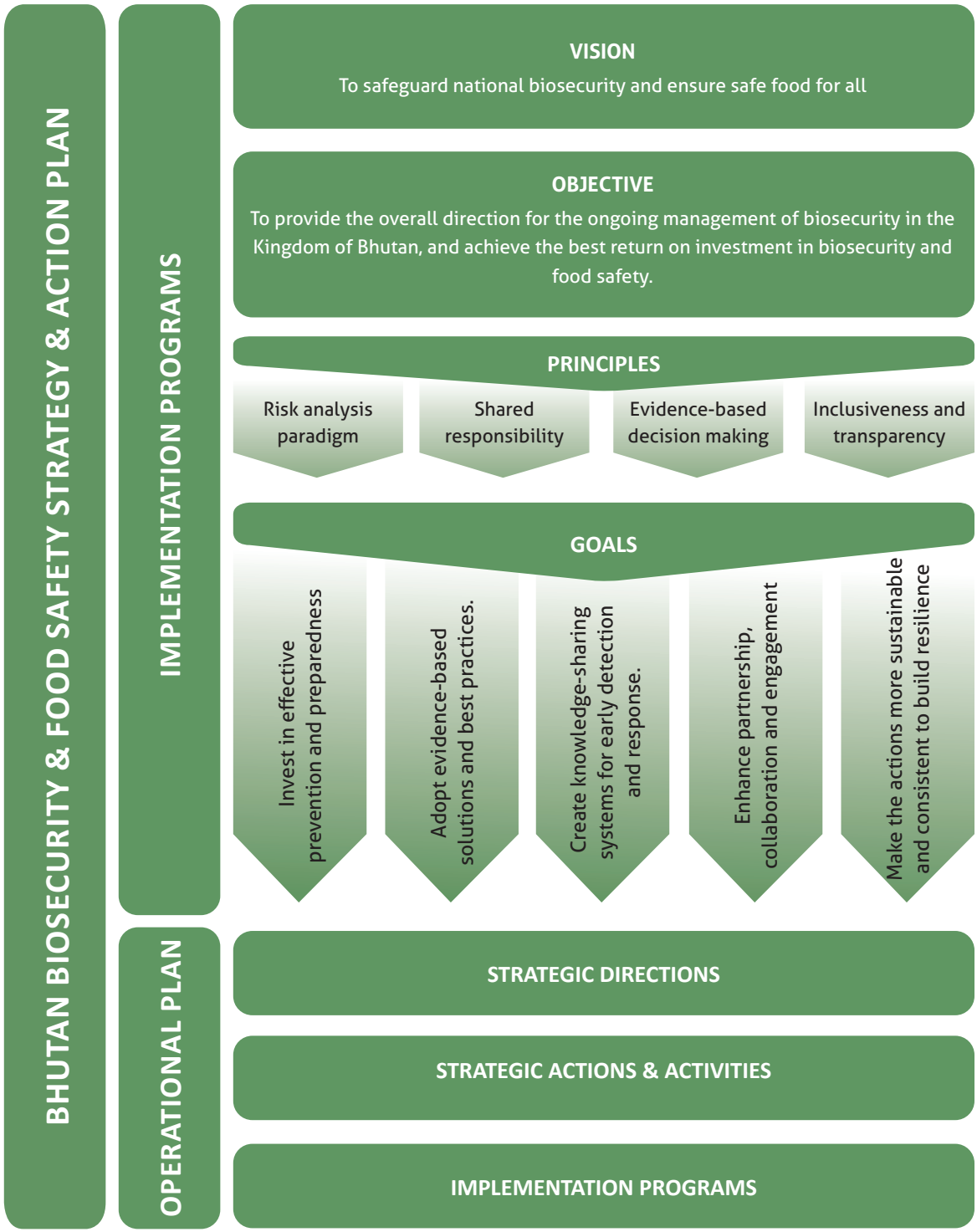


Figure 1: Bhutan Biosecurity & Food Safety Strategy Action Plan at Glance

4. The Underlying Principles of the Strategic & Action Plan

For the continuous improvement of Bhutan's Biosecurity capability over the next 7 years, this strategic and action plan underlines the four under-pinning guiding principles.

4.1 Risk Analysis Paradigm

Biosecurity is essentially about protection of people, plants and animals and the natural environment from risks and hazards. It is therefore imperative that biosecurity protections and controls are based on accurate assessments of these risks, including their likelihood and consequences, so that effective controls can be designed to reduce these risks to acceptable levels of protection (ALOP). Risk analysis should therefore be done systematically, consistently and transparently. In addition, as biosecurity measures impose costs and impediments on people, businesses and trade, it is important that these measures are the least restrictive measures necessary to manage the risks. Therefore, structured risk assessment enables to operationalize such measures that is vital for good biosecurity practices.

4.2 Shared Responsibility

No government or stakeholder, no matter how well resourced or prepared, can act alone in managing biosecurity threats and food safety risk. Everyone in the wider community has some level of shared responsibility i.e "duty of care" for Bhutan's biosecurity and food safety. These includes interventions such as i) to avoid or reduce impacts (early notification of an unusual pest or disease occurrence); ii) refraining from activities that may have biosecurity and food safety impacts on others (bringing in risk materials that could introduce a new pest or disease or moving plants or animals within Bhutan against regulations that could spread a pest or disease to a new location).

In Bhutan, a number of agencies share responsibility for different elements of biosecurity and food safety, and they need to work together closely and collaboratively to get the best outcomes. These actions call for close collaboration, sharing information and working in a symbiotic manner.

4.3 Evidence-based Decision Making

In addition to careful assessments of the biosecurity and food safety hazards and risks, decisions made by BAFRA need to be based on current and relevant information so there is an evidence to inform and support them. This also brings a responsibility to regularly review the information and evidence used to underpin decisions.

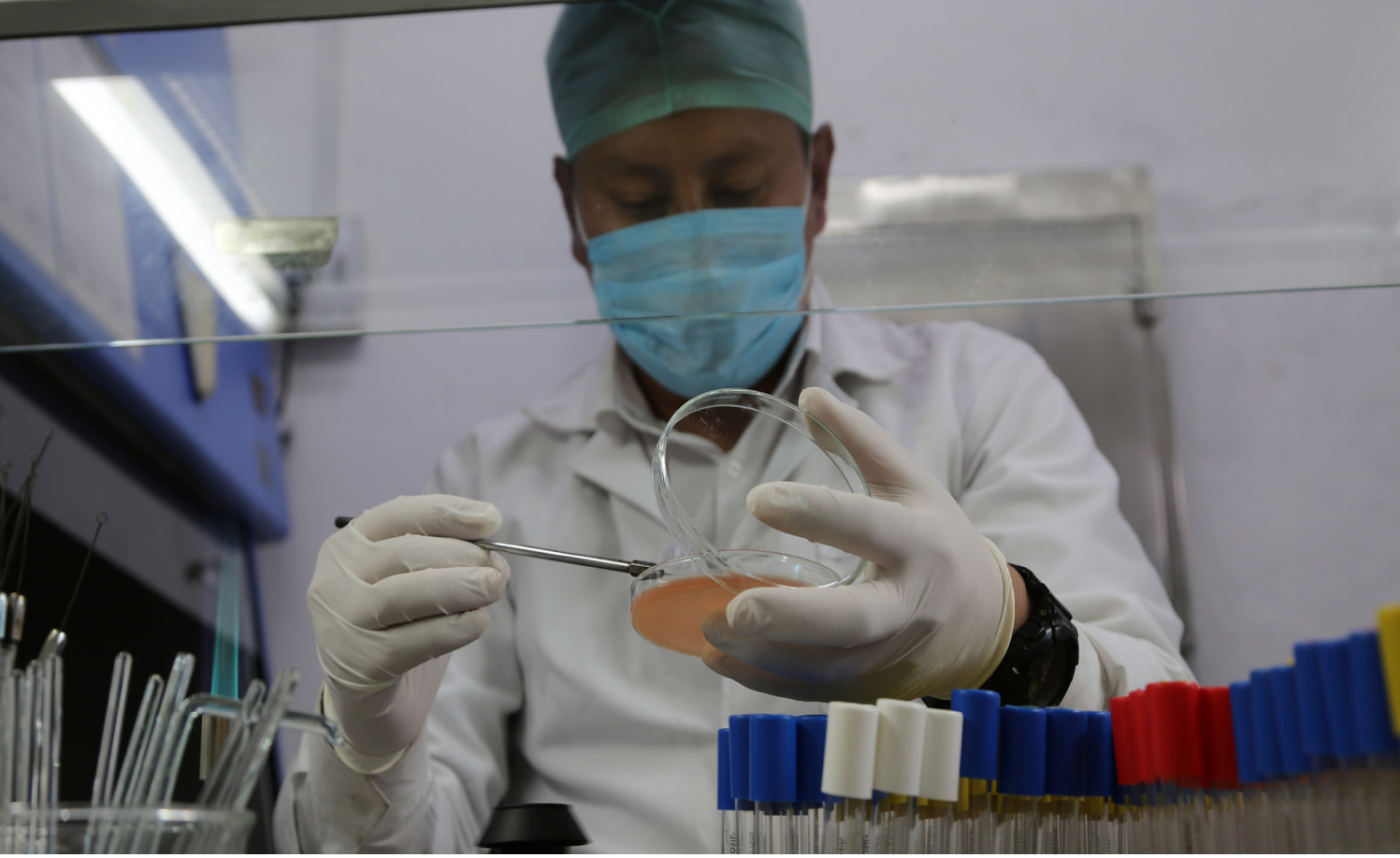
Like risk assessment, this principle is important to avoid biosecurity and food safety measures being unnecessarily harsh, being based on poor or outdated evidence/information and thus ineffective, or not being applied when they should be. Examples of the important evidence base include up to date knowledge of regional pest/disease status threatening the country; data on pests/diseases being intercepted at the border in the goods being imported; data on the level of compliance with import conditions, compliance with on farm Biosecurity standards etc.

Use of such an evidence base mechanism can facilitate informed-decision making and allows for performance-based approaches to compliance systems.

4.4 Inclusiveness & Transparency

Along with the *Shared responsibility* principle comes the need for the BAFRA to be inclusive in ensuring that a wide range of key stakeholders and community members are given opportunities to contribute towards policy development and decision-making. This takes effort, and both formal and informal mechanisms for stakeholder and community engagement are required.

There also needs to be transparency in the processes that convey decisions about biosecurity and food safety measures, such as import risk assessments, as these are critical for effective biosecurity and food safety and do not affect people and businesses. Making documented processes that underpin decision-making readily available, for instance online, assists those affected by biosecurity and food safety measures and enable them to understand how and why they are necessary, and provide confidence that these processes are sound.



5. Imbibing the Attributes of the GIC Model

5.1 The GIC Model Concept

Biosecurity is achieved through a continuum of activities that occur at pre-border, at the border, and within the country. In the absence of a biosecurity hazard analysis tools, it is necessary to focus on prevention, which is invariably the most effective area to target to obtain the best return on investment.

Prevention measures can never be perfect, and it is essential to plan and prepare for any pests and diseases incursion, based on an assessment of risk. Having a well-prepared plan before occurrence of hazards is critical to mounting an effective response and provides a high return on investment.

It is also important to have good surveillance systems in place inside the country for early detection of hazards especially when the country is free from those hazards. Early detection of hazards, and being prepared to respond effectively when detected, is the key in minimizing the costs and impacts and these activities represent sound investments. Surveillance also assists to facilitate exports by demonstrating freedom from trade-sensitive pests and diseases.

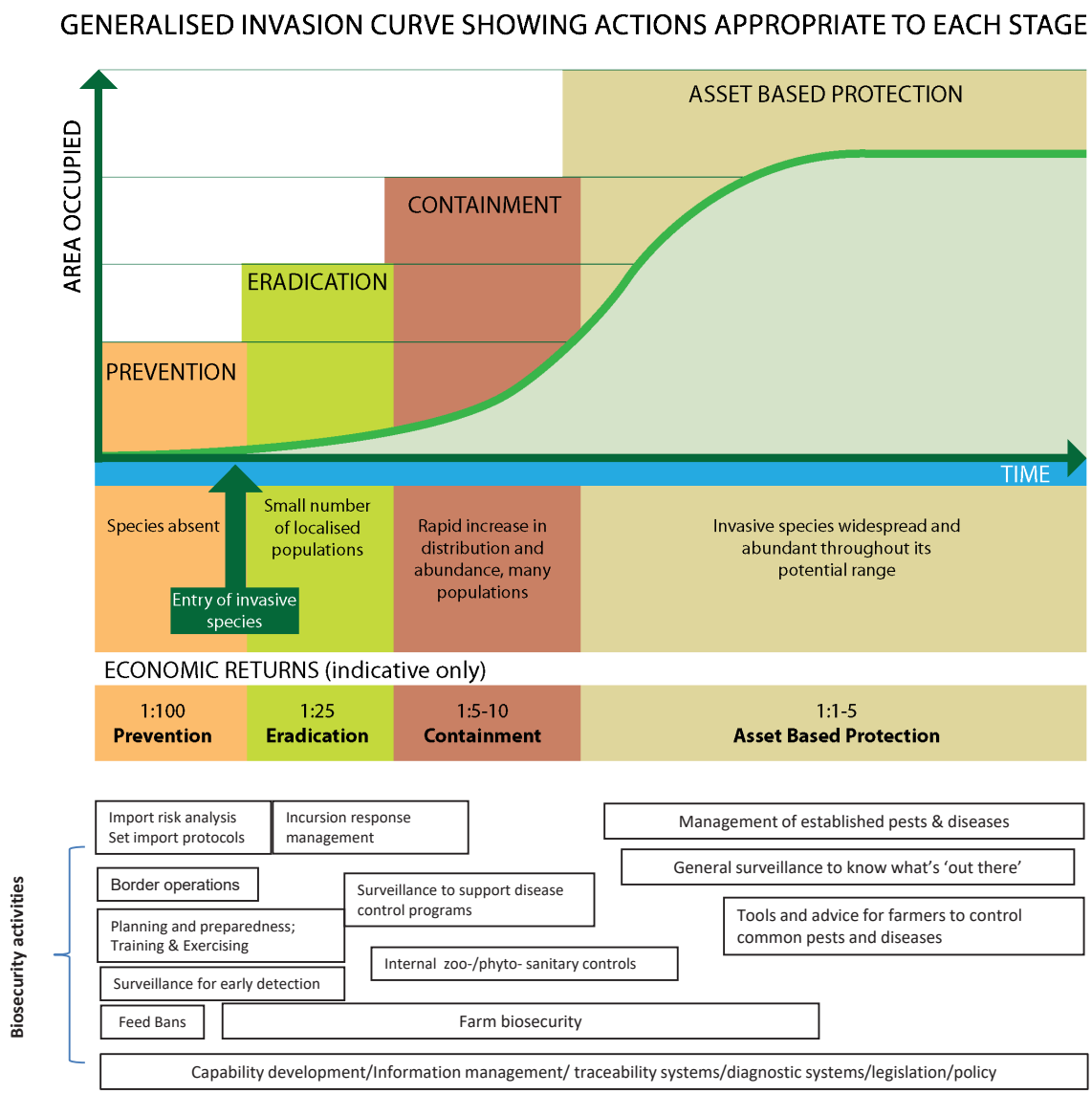


Figure 2 The Invasion Curve indicates greater economic return on investment for actions on the left side compared with asset-based protection on the right. (Adapted from Department of Primary Industries Victoria 2009)

Once a pest/disease/hazard spreads over a longer temporal and larger spatial dimension, the hazards become established subsequently, the management to protect assets such as livestock, crops, human health or the environment is often costly. It is always more cost-effective to prevent a problem from happening, or detect and manage it quickly, then having to bear the cost of managing its impacts for years/ generations to come should it become established. A simple way to model the continuum of biosecurity activities, and also guide where economic return is greatest, is through the Generalized Invasion Curve (GIC). The GIC model provides the visual way to demonstrate the key activities associated with the 'invasion' or introduction of a Biosecurity hazard (for example a new pest or disease) into the country, encompassing prevention, preparedness for, detection and response to the hazard.

In the above model of the Invasion Curve, indicative or relative figures on economic returns for each stage are shown. These should be seen not as actual economic returns, but an indication of the comparative returns for each stage of the invasion curve. Prevention provides the greatest return – shown as 1:100 – compared to Eradication – shown as 1:25, Containment at 1:5 to 10 and Asset-Based Protection (long term management of an established disease) at the other end of the scale. – shown as only about 1:1.5 in the model.

The model is applicable to all sector of animal, plant (including invasive alien species) and food safety, as it demonstrates how best to intervene (invest) at the earliest stage to prevent or minimize the impacts of biosecurity threats. With its visual simplicity, the GIC model will enable effective communication with policy makers, stakeholders and the community on the biosecurity and food safety activities.

5.2 The Four Stages of GIC

There are many biosecurity and food safety activities to undertake, and the challenge is to invest the limited resources wisely, to get the best return on investment. The GIC model, and its inherent principle that prevention and early intervention provide the best return on investment in biosecurity, will be used to guide and focus Bhutan's biosecurity activities and focus, and optimize the return on investment.

5.2.1 Prevention

This stage is the most important and crucial. The old maxim "Prevention is better than cure" is a testimony of this. Developing knowledge to assess and mitigate risks posed by new invasive species entering or having the potential to enter a jurisdiction is a key focus at this phase. It may involve environmental scans to identify new and emerging problem species, entry pathways and improved surveillance and detection techniques and methodologies.

A response decision framework is required, and may be developed for one particular species or for a class or category of taxa. The more restricted the number of taxa, the more detailed the response framework can be. Measures of success, or key performance indicators (KPIs) should be identified at the outset of a program to ensure that relevant data is being collected.

The case study 1 : Introduction of African Catfish into Bhutan provides a synopsis of the importance of the prevention stage.

Case Study 1:

Prevention on the Entry of African Catfish Into Bhutan

The African catfish has origin in Africa and are now found in countries outside its native range through translocation by aqua-culturists and anglers. It is a typical air-breathing fish which can grow very large up to 170 cm long and 60 kg in weight.

The introduction of catfish was first reported in 2003 in Phuentsholing, Chukha. People bought the live fishes across the India border as an act of tshethar (Buddhist practice of saving a living being from being killed/slaughtered). The fish were released into rivers and in the sewerage treatment tanks at Phuentsholing.

The catfish are generalist feeders that prey on a wide variety of species that are locally abundant, including those of economic importance such as common carp, grass carp, silver carp, etc. and conservation concern namely golden mahseer and goonch (catch fish). In addition to the ecological impacts, invasive catfishes affect other fisheries through predation and resource competition posing serious long-term threat to our native aquatic species.

Biosecurity response: BAFRA in collaboration with the Department of Livestock, Department of Forest and Park Services and Phuentsholing Thromde instantly formed a task force who visited the site and carried out assessment. The task force developed a strategy plan aimed at the prevention on introduction of catfish and removal of already introduced catfish.

BAFRA carried out intensive public awareness on the impacts of invasive catfish on native fish and alert reporting of the illegal fish imports. To prevent escape of the fish from the sewerage tank into the natural water bodies, a double layer net was put in place at the outlet of the sewerage tank. As a long-term preventive measure, the Livestock Rules and Regulation 2008 was revised and included a provision to ban on the import of animals for tshethar purpose. For the defaulters, a hefty fines and penalties were included in the law. The border vigilance system was put in place to monitor the illegal import of fish across the India border targeting the auspicious days and months of Bhutanese calendar (fishes are usually traded illegally for tshethar purpose on auspicious day). Furthermore, the heightened public awareness is given through social media and national media outlets.

5.2.2 Eradication

The eradication phase involves planning an operation based on best available techniques and information to eliminate the hazard as quickly as possible. The research component will help to make informed decisions so that any proposed eradication has been prioritized above other potential eradications based on likelihood of success, estimated resources required, and the projected benefits. It is likely that research will be required in order to undertake this prioritization: monitoring to define the distribution of a particular species; an assessment of the risk; the rate of spread; and the threats to values. Many species are usually quickly discounted for eradication as they are highly unlikely to be feasible to eradicate and become even less so as time elapses. This is often because the invasive species, pest or disease was not detected soon enough after introduction into the country and it has become too widespread, and/or there are insufficient resources or tools for eradication to be feasible and cost-effective.

Key activities that provide for the best opportunity to successfully eradicate an incursion include surveillance for early detection, and preparedness planning so that a rapid, pre-planned response can be activated.

The GIC model in Figure 1 presents an indicative economic return of 1:25 for Prevention - meaning that there could be a return of $25 for every $1 spent on eradication (compared to Prevention). This is because successful eradication means that future costs/impacts/losses from the hazard (alien species, pest or disease) if it established are avoided.

The case study 2: Eradication of Bird Flu (H5N1) provides a synopsis of the importance of the eradication stage.

Case Study 2

Eradication of Bird flu Outbreak

Avian influenza (AI) is a highly contagious zoonotic viral disease affecting various species of birds (domesticated and wild). Asia has reported the maximum number of bird flu outbreaks. Human deaths due to the H5N1 strain have been reported in Asia and worldwide over the past 10 to 20 years.

The first outbreak of H5N1 bird flu in Bhutan was reported in 2010 in Chukha district. This outbreak was epidemiologically linked to an illegal import of birds across India border by people as an act of tshethar (Buddhist practice of saving a living being from being killed/slaughtered).

The disease has high mortality in poultry and wild birds, with significant impact on production, economy and trade. There is a cross-species transmission can cause illness and mortalities in humans and cause social disruption to the people from food safety and zoonosis perspectives.

Biosecurity response: Following the outbreaks of highly pathogenic avian influenza (HPAI-H5N1) in Southeast Asian countries in January 2004, the Ministry of Agriculture & Forests (MoAF) and the Ministry of Health (MoH) initiated contingency measures to prevent incursion of H5N1 virus into the country. The team carried out risk assessments from January to February 2004 and concluded a very low risk for the incursion of the virus into the country. The Ministry instituted surveillance system in the animal health and human health sectors for early detection and respond to any outbreaks. The focal officers were identified from the DoL, BAFRA, and the Department of Public Health (DoPH) to facilitate collaboration between the two ministries to implement contingency measures.

With increased reports of outbreaks of HPAI in Indian states of West Bengal and Assam in 2006, the DoL and BAFRA developed the National Influenza Pandemic Preparedness Plan (NIPPP) under the World Bank-support project in 2006. The plan was tested through a series of desktop and field simulation exercises and core capacities were developed to respond effectively to an outbreak of HPAI and pandemic influenza in Bhutan.

When the first outbreak of H5N1 in Bhutan was reported in February 2010 in free-ranging poultry in Phuentsholing, Bhutan was fully prepared to respond effectively without the spread to other areas. To date, 13 outbreaks of H5N1 have been reported in 21 different locations in 7 districts in country which were rapidly contained following the implementation of the NIPPP and SOPs for a response to HPAI outbreak.

5.2.3 Containment

Assuming containment means stopping further spread of an invasive species then it can require similar activities as eradication and hence may be similar in costs. In practice, the so-called containment stage may suppress rather than prevent spread. Therefore, the invasiveness potential and threat potential of the control target and a risk assessment incorporating a cost-benefit analysis is necessary and requires regular review to ensure the decision remains valid.

The risk assessment would typically involve modelling of different scenarios, including potential total extent of occupation should the species become uncontrolled. Given the long-term commitment and resources required for containment, a clear understanding of the derived environmental, economic and social benefits is essential.

The case study 3 : Containment of Giant African Land Snail provides a synopsis of the importance of the containment stage.

The GIC model in Figure 1 presents an indicative economic return of 1:5 to 1:10 for Containment - meaning that there could be a return of around $5 to $10 for every $1 spent on containment, compared to 1:50 for eradication and 1: 100 for prevention. This economic return reflects that there will be benefits from containing a disease or pest to an area rather than affect the whole country, but there are also on-going costs to maintain containment measures.

5.2.4 Asset based protection

The asset-based protection phase refers to the situation where an invasive species has spread beyond the measures that might be applied under the prevention, eradication and containment scenarios to become widespread and established, and it becomes more cost effective to target efforts towards protecting key assets or values from the impacts of the target species.

Assets may be things like livestock and crops, or the natural environment (a major asset for Bhutan). Vaccination of livestock is an example of an activity to protect livestock (assets) from the impacts of an established disease, as is having to apply insecticides to crops. Because these activities need to be practiced more or less forever so long as the species/pest/disease is present, and can be expensive, the net economic return is lower.

The first focus of research in this phase needs to be on understanding what impact the pest has on productive and natural values. An assessment of what works and what doesn't, and why, will arise after a period of monitoring that can inform the exercise.

The GIC model in Figure 1 shows the economic returns from long term asset protection activities may be low (eg in the order of 1:1.5) compared with preventing the hazard in the first place, or successfully eradicating it should it enter the country.

Case Study 3

Containment of Giant African Land Snails

The Giant African Land Snail (GALS) originates in Africa and is one of the largest terrestrial snails, and one of the most invasive species in the world.

The GALS was first reported in 2008 in Gyalposhing, Mongar and was introduced by trucks bringing goods, equipment and heavy machinery for Hydro power plant construction into the country.

The GALS are known for high adaptability in the natural environment and poses a serious social, economic and environmental threat. The GALS are very aggressive and are voracious feeders on more than 500 species of plants, including crops. Consequently, GALS may displace or eliminate some of Bhutan's unique native species of plant. In addition, the GALS are known to harbor parasites of public health importance.

Biosecurity response: The Bhutan Agriculture and Food Regulatory Authority (BAFRA) in collaboration with district administration immediately initiated public awareness campaign to alert the public of the risks associated with the GALS and what they should do if they see GALS. BAFRA responded to reported sightings, destroying snails and putting in place the monitoring program to ensure further outbreaks.

This case study demonstrates the importance of early detection of exotic pests and rapid containment of the pest before spreading to other areas contributing in protecting the unique native species of plants.

6. Strategic Goals, Key Outcomes & Strategic Actions

The Bhutan Biosecurity Strategy communicates a vision for an integrated Biosecurity and food safety system and outlines goals, outcomes and strategic actions for implementation.

The five goals of this strategy are to:

1. Invest in effective prevention and preparedness.
2. Adopt evidence-based solutions and best practices.
3. Create knowledge-sharing systems for early detection and response.
4. Enhance partnership, collaboration and engagement.
5. Make the actions more sustainable and consistent to build resilience.

These goals, together with relevant key outcomes and strategic actions and detailed activities for implementation are presented in the following section:

6.1 Strategic Goal 1: Invest in Effective Prevention & Preparedness

The key to effective biosecurity and food safety is to focus on prevention and preparedness. The objective is to prevent the entry into Bhutan of exotic animal and plant pests and diseases, invasive alien species, and unsafe food. However, with the changing profile of global and regional risks and threats and the challenges of regulating Bhutan's borders, prevention cannot be absolute and it is essential to plan and prepare for response to biosecurity hazards that could evade preventative controls. Being well prepared before the hazard occurs is critical to mounting an effective response and provides a high return on investment.

6.1.1 Key outcomes

Outcome 1:	Bhutan's external biosecurity risks are well understood through access to timely information on regional and global pests/diseases and changes to pest/disease status
Outcome2:	Biosecurity risks associated with goods intended for importation into Bhutan are assessed and risks minimized before the arrival and entry of consignment into Bhutan
Outcome.3:	Border control systems are effective in minimizing biosecurity risks associated with goods released into Bhutan
Outcome 4:	BAFRA's biosecurity activities at designated entry points are supported by adequate facilities and equipment
Outcome 5:	BAFRA officials have the necessary technical capabilities to carry out biosecurity functions
Outcome 6:	Highest priority exotic pets and disease threats to Bhutan have been assessed and identified to facilitate risk-based, integrated approaches to prevention, preparedness and early detection.
Outcome 7:	Contingency plans for all priority pests and diseases are in place and regularly reviewed, to ensure rapid and effective responses to outbreaks.
Outcome 8:	National Action Plan is developed through application of Integrated approach to prevention, preparedness and early detection for the highest priority pests and diseases
Outcome 9:	External food safety hazards/risks are anticipated and managed by putting in place an effective import control system to gather relevant food safety information
Outcome 10:	Domestic food safety control systems are strengthened to ensure food quality and safety
Outcome 11:	Mechanisms for effective investigation and management of food safety incidences are established to ensure effective response to food borne disease outbreaks in the country
Outcome 12:	Technical capacity and capability of the relevant officials are enhanced to ensure preparedness
Outcome 13:	BAFRA field offices and designated satellite laboratories are adequately equipped with facilities to support food safety activities

6.1.2 Strategic actions

ACTIONS	ACTIVITIES
1.1 Strengthen communication and information exchange with regional and international organizations	a) Identify and nominate focal at the HQ to coordinate and communicate with relevant international organizations (FAO, IPPC, OIE, CAC, CBD) b) Attend annual meetings, seminars, webinars conducted by the International and regional organizations c) Disseminate the information to the relevant stakeholders and field offices (web, BBCH, emails, etc.) and educate on the use of international organization websites for biosecurity information
1.2 Strengthen the relationship with major trading partner countries	a) Identify the major trading partners for Bhutan for trade of livestock, plant & their products and institute linkages through signing of MoU (NPPO, EIC, etc.) b) Conduct regular coordination meetings to review and renew the MoU with trading partners c) Participate in agriculture expo and exhibitions in trading partners countries
1.1 Adopt a more structured, consistent approach and scientific methodology to carry out import risk analysis and pest risk analysis.	a) Develop Import Risk Analysis (IRA) and Pest Risk Analysis (PRA) methodology and Manual/Guidelines for animal and plant biosecurity risk assessments b) Provide trainings for BAFRA officials on the use of IRA and PRA manuals/guidelines c) Mainstream IRA & PRA in setting import conditions for commodities and maintain database of the outcome of IRA & PRA d) Disseminate the biosecurity import condition requirements for importer and trading partners through web, awareness workshop and social media e) Update the IRA and PRA manuals/guidelines based on the contemporary information

1.1 Strengthen border Biosecurity control system at all entry points to address identified needs.	a) Conduct studies to document the effectiveness of the current Integrated Check Points at Samtse, Nganglam and Lhamoizingkha, with the aim of providing good insights into how collaboration between agencies can be enhanced to improve biosecurity effectiveness at other border crossing points; i) Formation of team, ii) develop sets of questionnaires, iii) conduct field visits, iv) Report findings, v) policy interventions b) Evaluate the introduction of an Arriving Passenger Declaration system at point of entry jointly with Customs, supported with awareness and communication activities and materials. This could start as a trial with an initial focus at Paro Airport and review the declaration form which is currently in use; i) Review and develop the existing declaration forms, ii) Conduct awareness to the public, iii) evaluate the effectiveness c) Conduct feasibility study of developing and implementing a detector dog program to assist identification of biosecurity risk items at border points, commencing with the Paro Airport. This will be done in consultation with Customs and other regulatory bodies to investigate the feasibility of a joint detector dog program covering the needs of all participating agencies; i) develop concept note, ii) identify the partners for the program, iii) train officials on dog handling iv) Purchase trained dog, v) evaluate the effectiveness and acceptance by the public d) Reduce the number of designated entry points for high-risk goods, and/or increase the range of goods that must only enter through designated points; i) Indent the list of entry of biosecurity risk goods, ii) Conduct study on the practicality and suitability of high-risk goods entry for designated entry points, iii) Submit study findings to the policy markers e) Establish formal collaboration with border control agencies (Customs, forestry, RBP, immigration, etc.) to enhance the border screening and control over biosecurity risk items and goods. This may include formal delegation of authority to border control agencies to undertake biosecurity activities at entry points where there is no BAFRA office or few BAFRA officials. f) Review the border biosecurity control system and make necessary improvement.

1.1 Improve the facilities for screening (detention, inspection and sampling, & testing) of pests and diseases of plant, animal and their products according to risk-based protocols at designated entry points	a) Establish inspection facility at the entry points i) conduct need assessment, ii) inspection platform/yard with inspection equipment, iii) Detention facility, iv) Destruction facility (sprayer machines, incinerators, biological pits) b) Strengthen the animal and plant quarantine station and laboratory facilities for basic testing sample processing and testing: i) conduct need assessment, ii) equip facility for sample collection, processing, storage and transport equipment, iii) basic diagnostic equipment, c) Establish phyto-sanitary treatments facilities at entry points- (strengthen at Phuentsholing and Gelephu, and establish new at Nganglam)- (fumigation, cold treatment, hot water emersion, sterilization) d) At animal quarantine stations, improve the laboratory facilities for basic testing such as for hematology, and for processing and packaging of samples to be sent to NCAH involving more complicated tests.
1.2 Improve facility for surveillance and monitoring at the border	a) Provide one vehicle each at entry point for inspection and monitoring b) Equip rapid testing kits for the monitoring of animal, plant and GMOS for surveillance purpose
1.1 Build the competence of BAFRA officials in managing plant pests & diseases	a) Train plant officials on pest identification and diagnostic b) Orientation course on ISPM (International Standard for Phytosanitary measures) standards c) Specialization course in plant biosecurity i) Training workshop for capacity building on pest risk analysis (PRA) for plant quarantine officials (NIPHM, India), ii) Training workshop for capacity building on PRA(In-country), iii) Training workshop for capacity building on fumigation treatment -ex-country (NIPHM, India) d) Conduct training on environmental risk assessment of GMOs
1.2 Build field capability and capacity in veterinary public health, animal biosecurity including zoonoses emerging, and re-emerging diseases	a) Train officials on zoonoses and good veterinary practices (AMR) b) Train officials on dairy product quality assessment and detection of adulteration c) Train officials on meat inspection (AM and PM), certification, quality assessment, preservation techniques d) Train officials on emerging and re-emerging animal diseases e) Long term training on veterinary public health

1.1 Develop a list of exotic/ emerging plant pests and diseases of highest national priority using structure sets of criteria	a) Develop the list of prioritized exotic/emerging plant disease of highest national priority in collaboration with NPPC, DoA, NEC, NBC, DoFPS, importers; i) develop set of criteria for diseases prioritization, ii) carry out disease prioritization workshop/ activity, iii) Agree on the prioritized list of exotic and emerging animal diseases, iv) Publish handbook of priority pests, diseases and invasive alien species
1.2 Develop a list of exotic/ emerging animal diseases of highest national priority using structure sets of criteria	a) Develop the list of prioritized exotic/emerging animal diseases of highest national priority in collaboration with Department of Livestock (DoL); i) develop set of criteria for diseases prioritization, ii) carry out disease prioritization workshop/ activity, iii) Agree on the prioritized list of exotic and emerging animal diseases, iv) Publish handbook of priority pests, diseases and invasive alien species
1.1 Develop functional preparedness plans for the priority plant pests, diseases and invasive alien species	a) Develop pest-specific contingency plans for priority plant pest list, i) consultation with plant pathologist and entomologist, ii) Stakeholder consultation meeting, expert meeting, & consultation, iii) simulation workshops/exercise
1.2 Develop a functional contingency plan for priority animal diseases	a) Develop contingency/response plans for prioritized animal diseases b) Simulate and test the plans for completeness and effectiveness for preparedness, prevention, early detection and response c) Review and update the plan necessary to fill any gaps/make improvements in preventing their entry, detecting them quickly and responding to them effectively should they enter
1.1 Prepare National Action Plans (NAPs) for a select group of current highest priority animal diseases and plant pests to enhance Bhutan's capacity to prevent the introduction of the pest/disease, detect it early and prepare for a response.	a) Develop pest-specific action plans for priority plant pest list, i) consultation with plant pathologist and entomologist, ii) Stakeholder consultation meeting, expert meeting, & consultation, iii) simulation workshops/exercise

1.2 For animal Biosecurity, prepare NAPs for African Swine Fever and Lumpy Skin Disease, as both currently pose a significant threat to Bhutan's livestock.	a) Develop national action plans for African Swine Fever (ASF), Lumpy Skin Disease (LSD) diseases b) Simulate and test the NAP for completeness and effectiveness for preparedness, prevention, early detection and response c) Review and update the plan necessary to fill any gaps/make improvements in preventing their entry, detecting them quickly and responding to them effectively should they enter
1.1 Strengthen communication, co-ordination and collaboration with relevant authorities of major trading partners for food safety requirements of imported commodities	a) Conduct regular meeting between Export Inspection Council and BAFRA, MoA, RGOB to discuss the food safety issues of exported goods from India to Bhutan or to increase of scope of export certification by EIC for exports to Bhutan as per the MoU b) Institute a mechanism for border coordination meeting with the customs/food safety /NPPO officials of the neighboring towns of India bordering the major entry points of Bhutan (Phuentsholing/ Samtse/ Gelephu/ Samtse) to discuss food safety of the cross-border food trade especially concerning the informal food trade between the two countries which account for high informal food import without regulatory oversight; i) Field visit to Phuentsholing/ Samtse/Gelephu/Samtse for preliminary meeting with relevant stakeholders, ii) Development of a formal protocol for the Border Coordination Meeting, iii) Conduct of the meeting, iv) identify a Focal point in the customs/ food safety/ NPPO officials in both the country to forge good working relationship and timely sharing of information on pest and disease situation in either country
1.2 Strengthen communication and information exchange with international & regional organizations to ensure timely access to the latest food safety information	a) Link relevant food safety information repository system (INFOSAN, FAO, WHO) with BAFRA's website b) Finalization of the INFOSAN, IHR Communication protocol c) Training of BAFRA and Health officials on the implementation of the IHR communication protocol d) Regular update of information related to Biosafety and Food Safety; i) BBCH with new Biosafety information, ii) BAFRA's website on the external food hazards and other information e) Establish database system for handling application, management of border control and data capture for future import decisions of imported food commodities; i) Establish an online system for handling application and data capture for future /any food import decisions, ii) Hands-on Training of BAFRA officials

1.3 Strengthen border control system for imported food commodities	a) Establish Food Import Control System; i) Provide /Establish facilities and tools for effective border inspection, testing and clearance; ii) Capacity building of border control officials for import inspection and clearances , iii) Capacity Building on sampling and testing of the Food Commodities including the training on sampling, detection and identification of GMOs, iv) Establishment of a registration system for food importers , v) Sharing information on food safety requirements for import of food with relevant authorities through involving them in trainings and awareness programs held by BAFRA. b) Pilot test the Risk categorization of imported food commodities for risk- based border inspection and control c) Develop and integrate the Import of Food Derived from GMOs to the food database system
1.1 Strengthen domestic food safety licensing system	a) Establish online database system for management of internal food control system to streamline the domestic food safety licensing of food business (keep the current semi -online system for some uneducated population) b) Create awareness on Food Safety Licensing (FSL) including the GHP/GMP c) Implementation of FSL for all food processing industries d) Extend the scope of food safety licensing to all hotels, restaurants and bakeries in the country to ensure and enhance food quality and safety
1.2 Strengthen the Inspection and monitoring of food business	a) Update food inspection/monitoring checklists, guidelines and manuals b) Develop appropriate inspection and monitoring App to use checklist online c) Provide required inspection tools such as digital thermometer, appropriate sampling tools, tablet (onsite data collection) to all the BAFRA field offices d) Strengthen the monitoring and inspection of food businesses in the country through the provisions of training and accreditation of inspection services (ISO 17020) e) Provide training to FBOs on implementing internal controls and self-inspection.

1.3 Build technical capacity of the food business operators	a) Train food business operators on HACCP/ISO/Codex Recommended Code of practices and encourage FBOs on its implementation b) Advocating the importance of Good Hygiene and Good Manufacturing Practices among FBOs c) Conduct awareness program on Food Legislations and Standards to FBOs
1.1 Institute investigation Management system for food safety incidences.	a) Develop a functional contingency plan for managing the food safety incidences; a) Review and revise the existing food safety investigation manual and food recall manual to adapt to new challenges b) Training BAFRA Officials on epidemiology in relation to food borne illness outbreak investigation c) Establish traceability systems for identified high risk food products d) Finalize the IHR-INFOSAN communication Protocol for information sharing with national and international partners during food safety events and outbreaks of foodborne illness, and get endorsement for implementation by MoH and BAFRA, MoA e) Initiate awareness programs on FBD causes and outbreaks along with simulation exercises for the FBO/general public (esp. Schools, Colleges and religious institution) for better understanding and to tackle during actual crisis
1.1 Enhance the professional capacity of BAFRA field officials for conducting investigation and management of food safety incidences	a) Put in place necessary equipment and tools for investigation and management of food safety emergencies b) stablish online system for addressing food safety complain and also to collect data c) Capacity building of officials of relevant agencies for investigation and management of food safety emergency d) Training of BAFRA officials on foodborne disease outbreak response investigation and management, jointly with the counterpart officials from the Royal Centre for Disease control (RCDC), Ministry of Health. This should include simulation exercises. e) Provide trainings to the BAFRA officials particularly on investigation and management of food safety incidents

1.2 Strengthen Testing Capacity of the laboratory and Competence of laboratory officials	a) Hands on training of lab officials on detection of identified chemical and microbiological food hazards by using different techniques/methods b) Train on specific test method development and validation c) Training of laboratory officials on sampling and analysis of food commodities d) Strengthen testing capacity of national food testing laboratory (for example by purchasing equipment one high end equipment on priority basis) e) Establish Comprehensive/Annual Maintenance Contract for the lab equipment with the principal companies
1.1 Equip entry point offices with required infrastructure for screening (holding, inspection, sampling) of high-risk foods	a) Procure rapid test kits for prioritized food commodities for testing against chemical or microbiological contaminants for food adulterants of concern to Bhutan b) Establish designated inspection platform at entry point (Pling/ Gelephu/Samdrupjongkhar/Samtse) to facilitate screening of imported food c) Establish Laboratory rooms to carry out the basic testing or the sample preparation for further confirmation d) Purchase and commission ELISA reader and specific kits depending on the food safety hazard to be analyzed at strategic points e) Provision of adequate sampling tools and laboratory consumables for the satellite laboratories f) Develop SOPs for proper sample collection and delivery system of imported food
1.2 Equip entry point offices with required inspection and certification equipment's	a) Purchase appropriate basic equipment's/tools for sampling and inspection of food commodities

6.2 Strategic Goal 2: Adopt Evidence-based Solutions & Best Practices

It is essential that Biosecurity decisions, plans, regulations and identified solutions to manage threats are based on assessments of risk, supported by evidence and reflect the best practices. There is much to be learned from case studies and experiences and practices adopted in other countries and from research and Biosecurity-related programs such as those regularly published by the Food and Agriculture Organisation of the United Nations (FAO)and from international health regulations (IHR 2005) and standard setting bodies such as the World Animal Health Organisation (OIE), the International Plant Protection Convention (IPPC) and the Codex Alimentarius Commission (CAC).

Much of the information required for evidence-based decisions and solutions can be obtained through capture of data generated from BAFRA's functions and activities, but this requires data capture and management systems that are currently under-development. Regulatory restrictions that are evidence-based, have clear objectives and are based on assessed risk, allow for measures to be the least restrictive (i.e. impose the least regulatory burden) necessary to manage the risks, and ensure that costs do not outweigh benefits. This can serve to facilitate business activities and lower costs to stakeholders, and also to BAFRA as the regulator freeing up resources for higher priority activities. These also contribute to evidence-based Biosecurity measures and adoption of best practices.

6.2.1 Key outcomes and strategic actions

Outcome 1:	Strengthen relationship with relevant international agencies to gain access to latest information
Outcome 2:	Application of consistently high Farm Biosecurity standards and farming practices to minimize the risks of the spread of pest and diseases
Outcome 3:	Mandatory Biosecurity restrictions instituted on the movement of animals, plants and their products within Bhutan
Outcome 4:	Management of pre border Biosecurity risks posed by e-commerce (online trading of Biosecurity risk materials including food)
Outcome 5:	Biosecurity and food safety regulatory measures and services are innovative, creative and founded on technical knowledge aligned with modern best practices.
Outcome 6:	BAFRA has a robust data collection, management and analysis capability to support evidence-based planning and regulatory decision-making processes
Outcome 7:	International best food safety practices are in place (research outcome, programs, application & standards)
Outcome 8:	Establish robust data collection, management and analysis to support evidence-based solution, planning, regulatory decision and best practices
Outcome 9:	Internationally accepted food safety and quality assurance practices are adopted

6.2.2 Strategic Actions

ACTIONS	ACTIVITIES
1.1 Strengthen communication and information exchange with international stakeholders and ensure timely access to the latest OIE, FAO, IPCC and CAC, CBD information (standards, guidelines, manuals, SOPS and forms).	a) Improve communication and exchange of information with the international stakeholder's (OIE, FAO, IPPC, CBD); i) designate focal from HQ for communication and exchange of information with international stakeholder's, ii) participate in meetings in setting standards related to biosecurity and food safety iii) adopt evidence-based documents and best practices b) Establish linkages with international and intergovernmental agencies in the areas of animal and plant biosecurity research
1.1 Develop enabling instruments for regulation of livestock farm Biosecurity in consultation with the Department of livestock and other relevant stakeholders	a) Review the Livestock Act, Rules and regulations and associated tertiary legislations in promoting and regulating on-farm biosecurity; i) Conduct Regulatory impact assessment, ii) add provision of on-farm biosecurity regulations in the legal documents b) Develop specific farm biosecurity standards, checklist, formats, forms for each livestock farms (poultry, dairy, piggery, fishery) based on priority and needs c) Develop a system of evaluating the biosecurity performance periodically and adopt best practices
1.2 Develop enabling instruments for regulation of agriculture and forestry farm Biosecurity in consultation with the Department of agriculture and other relevant stakeholders	a) Develop specific farm biosecurity standards for each farm type (nursery, floriculture, seeds, horticulture)
1.3 Strengthen BAFRA's activity in promoting and regulating livestock on-farm Biosecurity	a) Develop a system of registration of farms for biosecurity management and enforcement; i) develop farm registration guidelines in consultation with DoL, ii) enforce registration process b) Enforce on-farm biosecurity regulations through inspections and monitoring; i) periodic inspection and monitoring, ii) education of livestock farmers on good farm biosecurity practices iii) reporting on biosecurity inspections, iv) Evaluation of on-farm biosecurity practices c) Review the farm biosecurity standards, checklist, forms, formats as and when required and make necessary changes and implement based on the evaluation assessment d) Enhance on-farm biosecurity education awareness; i) develop education materials (videos, and poster, etc.), ii) Conduct awareness
1.1 Strengthen BAFRA's activity in promoting and regulating agriculture and forestry on-farm Biosecurity	a) Registration of commercial farms (horticulture, floriculture, forestry, fodder) b) Develop farm inspection manual

1.2 Conduct economic and biosecurity risk assessment and rationalize the internal movement restrictions imposed on animals, plants and their products	c) Conduct cost-benefit analysis on the need to impose movement restriction of animals and their products within the country particularly in the circumstances where there are no exotic/notifiable disease outbreaks occurring; i) Review and assess the cost-benefit analysis of the current regulatory practices, ii) develop risk assessment framework and identify the risks/hazards intended to being managed by the restrictions in these circumstances, iii) determine whether there are alternative measures or approaches that impose less burden on people/business and on BAFRA's resources d) Conduct regulatory impact assessment
1.3 Assess the benefits of other systems such as owner declaration systems, farm accreditation systems, and farm and Plant/produce identification systems, as potential alternative or supporting systems to the current regulatory requirements, but which have a lower regulatory burden and free up resources.	a) Assess the owner declaration system as alternative system to the current regulatory system; i) develop owner declaration forms for movement of animal and animal products, ii) Assess the effectiveness of the owner declaration system through survey, iii) Initiate the owner declaration system b) Assess the farm accreditation system as alternative to the current regulatory system including farm identification and traceability; i) Prioritize the livestock farms accreditation ii) conduct study on the feasibility and effectiveness of farm accreditation system c) Assess the feasibility of using a farm biosecurity rating system to support and facilitate the movements of livestock and plants/produce (a good biosecurity rating would facilitate movements); i) Carry out on farm inspection/verification to facilitate the in-country movement based on farm biosecurity rating using checklists and questionnaires, ii) Categorize farms based on the level of biosecurity measures in place, iii) Carry out periodic visit to livestock farms to assess farm biosecurity measures practices
1.1 Develop enabling instruments to regulate the trading of animal and their products online (e-commerce) in conjunction with the producers, online trading service providers/ platforms, and courier services.	a) Conduct assessment of biosecurity risks involved through e-commerce of animal, plant and their products b) Study mechanism and business model of e-commerce of animal, plant and their products c) Develop One biosecurity portal system to manage biosecurity risks arising from e-commerce making reference to approach developed by other countries and their applicability to Bhutan; i) develop concept note, ii) develop user requirements in consultation with the stakeholder's, iii) system development

1.2 Manage biosecurity risk posed from the trading of animal, plant and their product by online and courier services of biosecurity risk online and courier services	a) Educate and create awareness on the One biosecurity system; i) provide trainings to the stakeholders on the use of portal system, ii) create awareness to general public b) Institute linkages with courier services in managing the biosecurity risk through; i) sign MoU with the courier services, ii) inspection and monitoring of biosecurity risk commodities coming through via courier services c) Equip courier service center with required equipment and facilities, capabilities (Scanners/detector dog at Courier service centers-screening of mails, Training on operation and maintenance of the equipment's)
1.1 Institute a regulatory research program aimed at generating technical knowledge and innovative approaches and developments to improve biosecurity and food safety regulatory measures and services.	a) Conduct biosecurity regulatory policy research; i) Prioritize the area of research, ii) develop study protocol, iii) conduct research, iv) policy intervention b) Conduct animal and plant biosecurity research; i) Prioritize the area of research, ii) develop study protocol, iii) conduct research, iv) policy intervention c) Conduct veterinary public health research; i) Prioritize the area of research, ii) develop study protocol, iii) conduct research, iv) policy intervention d) Establish Biosecurity and Food Safety research division/section under BAFRA
1.2 Strengthen the research capability and competency of the BAFRA officials	a) Provide training to the officials on development of research protocols/ methodology and research project grant b) Provide trainings on data analysis and paper writing; i) data collection, ii) data management, iii) data analysis, iv) data interpretation, v) paper writing
1.1 Strengthen the data management system on biosecurity and food safety that will allow capture of the field data, and analysis to inform risk assessments, planning and regulatory decision making	a) Conduct data/information need assessment; i) conduct review of the information and document needs of BAFRA on biosecurity and food safety that will assist evidences-based decision making and policy formation, ii) Review and document the available data that could be captured from BAFRA's biosecurity and food safety activities in the field that will contribute to meeting the identified information needs b) Strengthen the data entry and management; i) standardization of the data entry and reporting format, ii) supervision/auditing of the data reporting from the field, iii) improve management of data/information in the system by making it user friendly (entry through mobile); iv) customization of database system as per the need assessment, v) training on the customized database system c) Recruit data manager

1.2 Apply information generated from the database for decision making and policy formation (support use of a performance-based approach to border inspection and clearance)	a) Periodically review the information and provide data driven information for policy intervention; i) identify the focal for management of the database, ii) generate the data driven information and submit to the management, iii) management review the information and consider decide on the intervention measures. b) Apply the data driven intervention for policy intervention (evidence based regulation intervention, resource allocation, rewarding for performer, freeing up resources to focus on higher risk areas and goods, support use of a performance based approach for inspection and clearance - e.g. Regular exporters/importers of goods to Bhutan with a consistent record of compliance with import conditions could be subject to a lower level of inspection, poor performing importers or more intensive border inspections, etc.)
1.1 Strengthen communication and information exchange with international organization and ensure timely access to the latest information of standards, guidelines, manuals, SOPS and forms related to food safety and quality.	a) Improve communication and exchange of information with the international stakeholder's (FAO, CBD, CAC); i) designate focal from HQ for communication and exchange of information with international stakeholder's, ii) participate in meetings in setting standards related to biosecurity and food safety, iii) adopt evidence-based documents and best practices b) Establish linkages with international food safety research agencies
1.1 Develop robust database management system for data collection and analysis for planning and informed decision making.	a) Strengthen sharing and exchanging mechanism on the latest information on food quality and safety (Online platform) by identifying relevant focal officers b) Develop robust database management system for data collection and analysis for planning and informed decision making; i) Document the available data that could be captured from BAFRA's food safety activities in the field that will assist in evidence-based decision making and policy formulation, ii) Collect data from various activities in the field to conduct the risk assessments, which can be used for risk management and regulatory decision making
1.1 Establish mutual recognition agreement/ arrangement with international or regional organization/certification bodies to facilitate food trade	c) Strengthen the Inspection, Certification and Testing System and promote conformity assessment (inspection, testing, certification, standardization); i) Increase the scope of Inspection under ISO/IEC 17020, ii) Increase the scope of Certification under ISO/IEC 17065, iii) Increase the testing scope under ISO/IEC 17025 d) Implementation of international standards and guidelines to facilitate exports
1.2 Strengthen food safety and quality assurance framework and systems for trade facilitation and market access of food products	a) Implement international standards related to food safety and quality practices to regulate, support and facilitate food trade b) Establish and promote food safety management system-based certifications c) Educate the FBOs on the existing food safety and quality assurance systems d) Create awareness on importance of the Quality Assurance System in mutual recognition and global trade

6.3 Strategic Goal 3: Create Knowledge-sharing System for Early Detection & Response

Early detection of Biosecurity hazards that have entered or emerged in the country is essential to enable effective responses and reduce the costs of those responses and the impacts of the hazard. For this reason, early detection systems and activities provide a high return on investment because no matter how well Bhutan analyses the current risks, implement preventative controls and prepare for its responses to Biosecurity threats, a new pest, disease or threat may enter and emerge at any time. Early detection systems rely on knowledge and information-sharing with and between Biosecurity agencies, technical departments, farmers, food producers and sellers, forest rangers and the general community. Vigilance for, and reporting of, unusual signs of pests or diseases or possible invasive alien species is a shared responsibility of all Bhutanese people.

6.3.1 Key Outcomes

Outcome 1:	Farmers, animal owners, plant producers and the general community understand the importance of vigilance for unusual pest/disease signs in plants and animals, and possible invasive alien species, and they know whom to report to.
Outcome 2:	BAFRA's biosecurity activities are supported by adequate infrastructure facilities and equipment
Outcome 3:	There is an integrated approach to prevention, preparedness and early detection for the highest priority pests and diseases, through the development of National Action Plans
Outcome 4:	BAFRA has access to the diagnostic facility, capability and capacity it needs to support its functions.
Outcome 5:	There are effective systems for monitoring for biosecurity and food safety hazards.
Outcome 6:	BAFRA has the capability and capacity to respond to outbreaks, incidents and other biosecurity events requiring a timely response
Outcome 7:	Enhanced knowledge on food safety and good food handling practices to consumers and general community for reporting of food safety incidents/issues
Outcome 8:	Nationally coordinated surveillance system is in place for early detection, and timely responses to food safety incidents
Outcome 9:	Maintain appropriate quality systems for food Testing laboratories with competent technical officials in order for early detection of food safety hazards and to confirm food safety incidents.

6.3.2 Strategic actions

ACTIONS	
1.1 Strengthen the vigilance and pest/disease reporting elements of the farm biosecurity programs regulated by BAFRA in conjunction with the technical departments	a) Develop risk communication plan on biosecurity and food safety; i) develop draft plan, ii) conduct stakeholder consultation, iii) pilot-test the plan, iv) update the plan, v) Provide required training to BAFRA officials b) Enhance Education and awareness programs promoting community (producers, importers, exporters, and general public) on the identification of biosecurity pest and diseases; i) develop pest and diseases identification materials ii) conduct awareness on the pest and diseases identification for the producer and general public especially on the identification of pest and diseases c) Procure laptops, projectors and printers to conduct awareness programs
1.2 Enhance awareness and communication with agricultural producers, and the community in general, to promote vigilance for signs of unusual pest/disease occurrences in animals and plants	a) Improve pest and diseases reporting system by the public (producers, exporters, importers & consumers); i) educate public on the importance of reporting of biosecurity issues, ii) Increase hotlines or make accessible of BAFRA office contact numbers for reporting system, iii) identify biosecurity focal in the communities for reporting, iv) institute rewarding or incentives for reporting the biosecurity issues b) Active inspection and monitoring of farms for early detection; i) Institute BAFRA Biosecurity Vigilance Team ii) Develop ToR, iii) conduct risk-based inspection and monitoring iv) reporting of the biosecurity incidents, iv) incentives for over time payment c) Use crowd sourcing for reporting; i) Designate focal for monitoring of social media's platforms (facebook, wechats, whatsapp, etc.) as the source of diseases information ii) institute reporting and verification system
1.1 Strengthen biosecurity infrastructure facilities and necessary equipment for biosecurity enforcement	a) Construct biosecurity offices at Mongar, Phuentsholing, Tashicholing, Punakha, Paro, Haa, Tsirang, Pemagatsel b) Construct biological pits at Nganglam, Bumpagang, Rinchending, Sarpang, Gelephu c) Install x-ray scanners at the check posts for scanning vehicles d) Install incinerators at Bumpagang and Rinchending for disposal of biosecurity wastes e) Procure tools and equipment necessary for biosecurity enforcement (refrigerator, sprayers, milko-tester, thermometer, lactometer, cool box) f) Procure I-Pads for BAFRA field officials to map and report disease and for data collection

1.1 Develop functional disease prevention and control plans for the priority animal pests/ diseases and invasive alien species and enhance the capacity and capability of officials in diseases detection and response.	a) Conduct field and desktop simulation for the officials on disease prevention and control plan b) Periodically review and update the disease prevention and control plan based on the field applicability and best practices in collaboration with the technical department c) Provide training of officials on the 3D (Depopulation, disposal and decontamination) during diseases outbreak response d) Formation of Sectoral committee (Technical focal from BAFRA, HQ) e) Formation of National Bio-security committee (DoA, NEC, NBC, DoFPS, DoL)
1.1 Strengthen the laboratory diagnostic facility at Biosecurity offices to conduct basic laboratory diagnostics	a) Formalize the designation of National Center for Animal Health (NCAH) as the reference laboratory for disease screening for import of animals; i) Assess diagnostic capability gaps exist in detecting the prioritized diseases of NCAH, ii) define and agree the role of NCAH for referral of quarantine samples to reference laboratories outside Bhutan, iii) Sign an MOU between BAFRA and NCAH to formalize mutual understanding and commitment to collaborate and coordinate diagnostic testing needs and capabilities b) Sign MoU with NPPC for narrowing the gap of plant diagnostics laboratory requirements c) Construction of the laboratory facilities for plant biosecurity d) Procurement of the laboratory equipment and testing kits
1.2 Strengthen capability and capacity for laboratory diagnostics for plant biosecurity	a) Develop manual/guidelines and SoPs for diagnostic facility operation and other rapid test kits b) Sign MoU with other international referral laboratories for technical support c) Develop or upgrade the technical knowledge of the BAFRA officials in laboratory diagnostics for plant biosecurity
1.1 Institute surveillance program for safety and quality monitoring for foods of animal origin	a) Institute surveillance program to monitor the safety and quality monitoring of meat and meat products in the country b) Institute surveillance program to monitor the safety and quality monitoring of animal feeds c) Institute surveillance program to monitor the safety and quality monitoring for dairy products d) Institute the inspection and monitoring of farm animal welfare including tshethar animals
1.2 Strengthen surveillance for the pest and diseases for registered nurseries	a) Initiate surveillance program for the high-risk nursery firms; i) Survey of the nursery growers to know about their understanding of the prevailing pest and diseases in their nursery, ii) Develop standard forms and formats for proper recording of data, iii) Use diagnostics tool kits in the field for pest and diseases surveillance b) Strengthen surveillance for the GMO in registered nurseries/field

1.3 Develop and make functional of reliable and efficient pest monitoring system for movement of plant pest and disease	a) Develop PRA tools; i) Carry out knowledge gap identification in pests and disease, ii) Develop pests surveillance system questionnaire b) Develop plant pests and diseases databases
1.1 Improve capability of BAFRA officials in the management of animal biosecurity incident responses, jointly with the technical departments	a) Conduct field and desktop simulation for the officials on disease prevention and control plan b) Periodically review and update the disease prevention and control plan based on the field applicability and best practices in collaboration with the technical department c) Provide training of officials on the 3D (Depopulation, disposal and decontamination) during diseases outbreak response
1.2 Improve capability of BAFRA officials in the management of Plant biosecurity incident responses, jointly with the technical departments	a) Training of Plant officials on Plant biosecurity incident response plan b) Periodic awareness program on GMO incident management c) Conduct simulation exercise for field officials and stakeholders on the contingency and action plan d) Training of BAFRA official's documentation on the plant biosecurity responses
1.1 Establish system for early alert and reporting of food safety incidents	a) Establish/upgrade alert and reporting system at the national level through online reporting system; a) Develop SOP for alerting and reporting of food safety incidents, b) Create awareness among the FBO's and general public on food safety hazards and alert system, c) Provide training to FBO's on response to food safety hazards b) Establish alert and reporting system at the international level through IHR-INFOSAN protocol c) Training of BAFRA officials on food fraud and traceability d) Bring on board food industries and consumers in the formulation of guidelines, regulations and standards to improve transparency and ensure better coordination and cooperation e) Establish mechanism for effective response to detected food safety hazards
1.2 Capacity building of FBOs and consumers on food safety hazards and alert system	a) Awareness Workshop on Food Safety Culture to the FBOs and emerging entrepreneurs b) Training of FBOs on GMP/GHP, Food Business Licensing, Food Handlers, HACCP, Food Safety and Quality Assurance c) Organize awareness campaigns and workshops on Food Safety focusing on its impact on achieving SDGs d) Training of FBOs/General public on food fraud, food defense and food authenticity

1.1 BAFRA field offices equipped with appropriate facilities/ tools to respond to food safety incidents	a) BAFRA field offices equipped with appropriate facilities/tools for surveillance and monitoring activities to respond to food safety incidents b) Procurement of sampling tools and equipment c) Procurement of pool vehicle for BAFRA field offices d) Carry out surveillance activities on priority food category on annual basis e) Purchase of rapid test kits and sampling tools f) Development of infrastructures and facilities at BAFRA field offices for proper management of food safety hazard
1.2 Build technical capacity and capability of field officials in early detection and response to food safety incidents	a) Ex-country and in-country hands-on trainings for field officials in early detection and response to food safety incidents b) BAFRA officials are trained on implementation of the response mechanism c) Training and simulation exercise for BAFRA officials on response to food safety hazards d) Training of laboratory and food safety officials on sampling of food commodities
1.1 Enhance the capacity of food testing laboratories to detect food safety hazards	a) Upgradation of the existing Laboratory Information Management System (LIMS) for prompt services in the event of food safety incidents b) Establish Sample Delivery System; a) Purchase of the Specialized Sample delivery van in the food lab, b) Put in place the sample transport/delivery system from every BAFRA offices till the Food Lab by establishing linkages between field offices and courier services c) Procurement of GCMSMS for detection of pesticide residues and other food safety parameters d) Procurement of LCMSMS/ICPMS for antibiotics, coloring agents, heavy metals and mycotoxins e) Hands-on Training of laboratory officials on different applications using the high-end equipment f) Development of sampling manual including decision rule for the acceptance and rejection of the food consignments/lots g) Ex-country and in-country hands-on trainings for lab officials on early detection of food safety incidents h) Maintenance of ISO: IEC 17025 for general competence of testing and calibration laboratories i) Purchase of basic laboratory equipment for sample preparation and basic testing at the satellite laboratories

1.2 Establish linkages with referral/reference food laboratories at the regional and international level.	a) Identify referral/reference laboratories within/outside Bhutan for testing food commodities for which the testing capacity is not within Bhutan b) Establish MoU/Agreement with identified laboratories for testing, capacity building and knowledge sharing c) Exchange programs between the officials of NFTL and identified laboratories outside Bhutan d) Establish resource sharing modalities with relevant national agencies for effective and efficient analytical services
1.3 Strengthen the robust database management system for food testing laboratories	a) Develop the technical competence in the area of authenticity testing b) Equip the food testing laboratories with the tools and equipment for authenticity testing; a) Develop user manual and conduct ToT for training field officials
1.4 Strengthen the technical capacities and capability of the laboratory officials	a) Ex-country and in-country trainings for lab officials on early detection of food hazards b) Establish attachment programs with regional laboratories
1.5 Enhance research capacity of the food testing laboratories on identified food safety hazards to generate scientific data for early detection of food safety hazards	a) Initiate research program on identified food safety hazards; a) Short term research training programs for lab officials, b) Linkages with the Food Research institutes in other countries b) Develop rapid test kits customized for Bhutan to detect adulteration in country in collaboration with AOAC and other counterparts, India c) Develop rapid test kits customized for Bhutan to detect adulteration in country in collaboration with AOAC and other counterparts, India

6.4 Strategic Goal 4: Enhance Partnership, Collaboration and Engagement

Biosecurity is a shared responsibility and therefore BAFRA with close coordination, consultation and collaboration with relevant agencies, sectors, key trading partners and international standard setting bodies and with the Bhutanese community in general has to effectively manage Bhutan's Biosecurity and food safety issues and concerns. A fully effective Biosecurity system for Bhutan relies on a seamless and coordinated complementary of roles and responsibilities between BAFRA and the other government agencies with which it works. The main objective of this strategy is that government, industry and community understand each other's roles and responsibilities in prevention, preparedness, early detection and response to Biosecurity threats. Engagement with key stakeholders and the community requires arrangements that empower them to make direct inputs into policy and programs development.

6.4.1 Key Outcomes and strategic actions

Outcome 1:	All relevant agencies are engaged and involved in providing advice to BAFRA on biosecurity policy development.
Outcome 2:	There is strong and effective communication, coordination and collaboration among relevant border agencies
Outcome 3:	Industry and community participants are directly engaged in the formulation of policies and regulations to improve transparency and ensure better coordination and cooperation in the field.
Outcome 4:	Constitute strong and effective communication, coordination and collaboration with international and regional bodies on food safety
Outcome 5:	Establish effective institutional linkages, communication, collaboration and engagement with relevant stakeholders at the national level.

6.4.2 Strategic actions

ACTIONS	ACTIVITIES
1.1 Formation and operation of a Biosecurity commission and committee with membership of government, industry, and other stakeholders who are partners in the effective operation of the Biosecurity System to discuss key national biosecurity policies and reforms	a) Formation and operation of Biosecurity commission; i) develop ToR for the biosecurity commission, ii) approval from the RNR - GNHC, iii) formation of biosecurity commission, iv) convene meetings b) Formation and operation of animal biosecurity technical committee; i) Development of ToR for animal biosecurity technical committee, ii) Formation of animal biosecurity technical committee, iii) Conduct regular meeting c) Formation and operation of plant biosecurity technical committee; i) Development of ToR for animal biosecurity technical committee, ii) Formation of animal biosecurity technical committee, iii) Conduct regular meeting
1.1 Establish a Border Coordination Group comprising of key agencies operating at the border to improve communication and engagement with opportunity in shaping and designing the biosecurity policy and measures	a) Formation and operation of Border Coordination Group; i) develop of ToR for the Bord coordination group, ii) formation of Coordination Group, iii) conduct regular meetings b) Development of border biosecurity control plan
1.2 Identify and develop co-regulatory opportunities for equivalence to biosecurity regulations to ensure application of regulation is least-restrictive but meets biosecurity system requirements	a) contracting biosecurity monitoring/inspection to competent firms b) Promote certification of farms and business c) Initiate assessment and scoring of farms d) Feasibility study for establishment of e-Phyto system for safer, faster and cheaper rate
1.1 Implement a community liaison and advisory committee that includes key stakeholders, is chaired by a senior BAFRA sectoral official, and with terms of reference focused on consultation about BAFRA's policies, procedures, standards and regulations	a) Engage community and industry participation for during the formulation of policies, acts, regulations, guidelines and standards; a) Conduct stakeholder's analysis, b) engage stakeholder's during the formulation of policy and legislation.

1.1 Develop linkages with food safety authorities/ recognized agencies of trading partners for mutual recognition of inspection and certification system	a) Initiate signing of MOU/establish mutual recognition agreement with Food Safety and Standards Authority of India (FSSAI) to facilitate export of food and agriculture products b) Initiate signing of MOU/establish mutual recognition agreement with relevant agencies in Bangladesh to facilitate export and import of food and agriculture products between Bhutan and Bangladesh c) Initiate signing of MOU/establish mutual recognition agreement with relevant agencies in Thailand to facilitate import and export of food and agriculture products between Bhutan and Thailand
1.2 Strengthen collaboration with international agencies (WHO, FAO, OIE, IPPC, CAC)	a) Initiate Bhutan's accession process to the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety; i) Preparation of accession document and discussion lead by (need to include Legal section and NEC), ii) Presentation to NBB, iii) Translation of accession document into Dzongkha, iv) Presentation to environment committee in Parliament b) Provide training on the Food Fraud and food defense using the FAO/WHO experts c) Leverage on FAO/WHO/OECD/BCH experts to provide training on traceability and e-commerce
1.3 Strengthen national codex structures, INFOSAN ECP, IHR focal point for better participation in regional and global meetings.	a) Strengthen Codex (Bhutan), INFOSAN Secretariat functioning b) rain relevant stakeholders especially the NCC members and INFOSAN focal points in various agencies to build their capacity to contribute and participate in regional and global meetings of importance to Bhutan
1.1 Strengthen collaboration and engagement with relevant stakeholders in the area of food safety and quality through one health approach	a) Enhance collaboration and engagement with stakeholders by; i) engagement of public during the formulation of policies/ regulations/ standards to improve transparency and ensure better coordination and cooperation, ii) liaise and support food entrepreneurs in the country to take forward the agenda of food safety culture, iii) Encourage investment and collaboration with private sectors to improve food safety in the country b) Harmonize safety assessment of food derived from GMOs with international best practices and trading partners; i) Review and update existing Guideline, ii) Capacity building of technical working group from relevant agencies on the conduct of the safety assessment in collaboration with neighboring countries
1.2 Establish linkages with border control agencies to foster partnership, coordination, engagement for effective implementation of imported food control system	a) Establish information sharing mechanism with the border control agencies for food import control; a) Develop a formal protocol for collaboration, b) Identify focal official from the border control agencies

6.5 Strategic Goal 5: Make the Actions More Sustainable & Consistent to Build Resilience

The complexity of functions that BAFRA has to perform requires systems and processes that ensure there is a structured, sustainable and consistent approach towards service delivery and interventions for Bhutan's Biosecurity protection. This way organizational resilience can be built through well documented processes and procedures, effective regulatory functions, relevant Policy and Legislation, consistency in the application of regulations and associated procedures, highly skilled staffs, by prioritizing the actions, by diversifying, by targeting economically beneficial actions and by introducing and applying innovative, creative and latest techniques and technologies.

6.5.1 Key outcomes and strategic actions

Outcome 1:	Bhutan has effective legislation, regulation and policy to support BAFRA's biosecurity and food safety functions
Outcome 2:	BAFRA has, and follows, clear, consistent and documented processes and procedures for carrying out its roles and responsibilities and mandated regulatory functions.
Outcome 3:	Non regulatory schemes (Food safety culture and self-regulation) by food business operators and consumers promoted to ensure food quality and safety in the country

6.5.2 Strategic actions

ACTIONS	ACTIVITIES
1.1 Conduct periodic reviews of biosecurity and food safety legislation, regulation and policy to ensure laws and regulations are contemporary and current to ensure legislation supports the roles of government, industry and the community to deliver effective biosecurity activities	a) Pursue the management autonomy of BAFRA functions to avoid conflict of interest, improve the services, reduce the administrative burden b) Develop biosecurity bill; i) Conduct RIA, ii) Conduct consultative workshop, iii) Develop biosecurity bill c) Review and update biosecurity legislation every after 10 years d) Review Food Act of Bhutan 2005 and its regulations e) Review and update standards every after 5 years
1.1 Initiate self-sustenance of food testing laboratories	a) Ensure the compliance continuum from education to prosecution is implemented in an appropriate and consistent manner; i) conduct education and awareness on the legislations and policy, ii) implement and execute the biosecurity activities as per the legislation (enforcement and prosecution) b) Institute public private partnership schemes for the sustenance of food testing laboratory; i) Conduct cost benefit analysis of the laboratory services provided by the food testing laboratories, ii) Develop a protocol/ guideline to levy charges for specific testing parameters, iii) Conduct awareness on the protocol to levy the charges on the testing services c) Conduct the National Codex Committee and National Food Quality and Safety Commission meetings to formalize the proposal
1.1 Develop, revise and updates required documents (Guidelines, standards, manuals, procedures, standard operating procedures, forms, & formats) for biosecurity enforcement by BAFRA officials in the workplace, and to support training and capability development	a) Develop, revise and update Guideline's manuals, procedures, standard operating procedures, forms, & formats for biosecurity and food safety
1.2 Make access of the documents to ensure there is a structured, sustainable and consistent approach to the provision of services and the carrying out of activities that are vital, in this case, to Bhutan's biosecurity protection	a) Make access of enabling documents to BAFRA officials; i) Orientation of new recruits on documents, ii) creating information toolkit for easy access in BAFRA web

c.1 Promote Food Safety Culture and incentivizing (award of quality mark) Food business operators.	a) Encourage self-checking/rating/regulations based on the regulatory requirements; i) Encouraging the FBOs to Initiate self-regulation through reward system (ex. Issuing certificate and reflecting it on our BAFRA's website along with the picture of the FBO to encourage them to continue with their practices as well to encourage other FBOs) b) Develop food safety and hygiene rating system for hotels and restaurants c) Facilitate food safety certification of FBOs for market access d) Provide quality mark that will help gain confidence of consumers e) Promote Food Safety Culture among FBOs and stakeholders; i) Create awareness workshop f) High level meeting to initiate a policy level commitment through declaration for food safety culture from senior government officials g) Developing of outreach materials and reaching out to FBOs and consumers through use of AV/social media/print media h) Establishment of food entrepreneurs (food innovation group) which would operate in conjunction with BAFRA to develop key awareness messages on food safety culture unique to Bhutan; i) Establish a food safety culture platform for the food innovator group with TOR and Guiding Framework, ii) Identity high level food safety champion/leader to promote the culture of food safety, iii) ToT for food safety culture and private individuals

7. Conclusions

With this Strategic document in place, it is expected that the threats from biosecurity are well anticipated and that appropriate and timely interventions and measures will be taken by BAFRA and relevant agencies to prevent the spread or introduction of harmful organisms to human, animal and plant life and the environment.

Food Security requires Bio-security. There can be no food security without bio security. Therefore, whatever we produce, eat, and trade, must be free from bio-risks. Policy makers and service providers must be committed to the agenda of Biosecurity and it should be mainstreamed in the national policy. Strategic interventions and strategic partnerships also need attention.

Transpiring from the above foundation, the National Biosecurity and Food Safety Strategy and Action Plan 2021-2028 vision and strategies are based on the following broad values:

- Safe and Self-reliant food system;
- Sanitary and phytosanitary (SPS) measures to protect the health and life of humans, plants and animals including the environment from risks of entry, establishment and spread of exotic pests and diseases;
- Quality and safety of food and feed;
- Regulation of products derived from genetically modified organisms;
- Competitive food and agriculture/livestock products; Bhutan Organic, Good Agriculture Practices;
- Efficient food testing services for biological and chemical parameters;
- Relevant research related to Biosecurity and Food Safety.

These broad values were used as the guiding principles in framing the strategic goals and devising strategic outcomes to support the Bhutan Biosecurity and Food Safety Strategy goal. To achieve the strategic vision, the operational plan (strategic action and activities) was developed in close consultation with the field offices. For the implementation of the operational plan, the sourcing and securing of Biosecurity Fund will carried out by the BAFRA help to fulfill the national objective of food safety and Biosecurity. The detail costing for each activity under each action for all the five strategic goals were done, and detail costing are available with BAFRA.

Bhutan Agriculture and Food Regulatory Authority
Ministry of Agriculture and Forests
Royal Government of Bhutan