Bhutan Agrifood Sector Strategy 2034

A COMMITMENT TO INNOVATION, TRANSFORMATION AND IMPACT

MINISTRY OF AGRICULTURE AND LIVESTOCK

ROYAL GOVERNMENT OF BHUTAN

THIMPHU

MESSAGE FROM THE MINISTER

In many ways, Bhutan is at a crossroads. In order to ensure that Bhutan remains on track to fulfil our developmental goals and secure prosperity for our people, over the last few years, following COVID-19 pandemic, major reforms are being undertaken across all key public sector agencies. In tandem with the reforms, the 13th FYP has been adopted under the broad national framework of 'Developed Bhutan: A Healthy, Prosperous and Secure Bhutan'. Key indicators have also been defined under the themes of 'Prosperity, People and Progress'.

The agrifood sector remains pivotal to ensuring that the fruits of transformation are realised and that goals prescribed in the 13th FYP and beyond are met. Strategic interventions, bold investments, innovation and a renewed focus on the agrifood sector is required to secure Bhutan's prosperity as we continue to chart our course into the future. Despite considerable inherent challenges, and significant risks emerging from climate change, the full potential of the agrifood sector is yet to be realised.

It is clear that 'business-as-usual' approaches are failing to deliver dividends. As we move ahead, while continuing to strengthen and support smallholders, we will increasingly pivot towards commercialisation and expansion of high value exports. We will broaden support and encourage the private sector, cooperatives and youth to build agrifood enterprises. We will expand markets, assure standards and build core competencies along the value chain. This intent is clearly spelt out in the Bhutan Agrifood Sector Strategy 2034. The Strategy builds on the Pathways for Transforming Bhutan's Food Systems and is underpinned by the Food and Nutrition Security Policy of Bhutan 2023.

It is my hope that this document will serve as a key guiding framework to bring about focus and coherence and sustain impact in the near and long term. The time is now to mobilise our collective resource endowment of the agrifood sector to help sustain Bhutan as we navigate the next trajectory of our development arc.

Tashi Delek.

(Younten Phuntsho)
MINISTER

FOREWORD FROM THE SECRETARY

The Agrifood Sector Strategy 2034 aims to harness Bhutan's untapped agri-food potential, a critical driver of the nation's progress. The sector contributed 14.67 percent of GDP engaging 43.5 percent Bhutan's employed population.

Going forward, the strategy envisages to exploit latent potentials of the sector in contributing to the nation's vision to build a developed nation 2034. Accordingly, it envisions to increase the GDP to Nu. 100 billion and treble export value to Nu. 9 billion by 2034. Therefore, the effective implementation of this Strategy stands to be critical in meeting Bhutan's national goals.

Key priorities include commercial farming, promotion of high value commodities, strengthening market access, expanding exports, advancing technology adoption, and fostering private sector engagement to drive growth and transformation. Recognizing the vital role of smallholders, targeted efforts will enhance their productivity and income through mechanisms such as human-wildlife conflict mitigation, index-based crop and livestock insurance, and capacity-building support for farmer groups and cooperatives. These initiatives aim to address scaling challenges while ensuring value addition.

Special emphasis will be placed on empowering youth by providing skills and opportunities to establish agribusinesses, creating meaningful jobs, and boosting incomes. Efforts will also focus on setting standards and certifying Bhutanese agri-food products to enhance their marketability.

Given the escalating threats posed by climate change, the Strategy prioritizes resource mobilization to mitigate greenhouse gas emissions and adapt to climate impacts. By addressing these challenges and fostering greater collaboration among stakeholders, the Strategy envisions a dynamic, resilient, and inclusive agri-food sector that significantly contributes to Bhutan's prosperity.

I would like thank the formulation led by the Policy and Planning Division (PPD) of the ministry for coming up with the robust strategy and look forward to the successful implementation of this strategy.

(Thinley Namgyel)
SECRETARY

Table of Contents

ACRONYMS

AFSS:	Agrifood Sector Strategy
ARDC:	Agriculture Research & Development Centre
B2B:	Business to Business
BDBL:	Bhutan Development Bank Limited
BFDA:	Bhutan Food & Drug Authority
BLDCL:	Bhutan Livestock Development Corporation Limited
BOS:	Bhutan Organic Standard
Cft:	Cubic foot
CSO:	Civil Society Organization
DAMC:	Department of Agricultural Marketing & Cooperatives
DFS:	Digital Financial Services
DHI:	Druk Holdings & Investment Limited
DoA:	Department of Agriculture
DoFPS:	Department of Forests & Park Services
DoI:	Department of Immigration
DoL:	Department of Livestock
FCBL :	Food Corporation of Bhutan Limited
FDI:	Foreign Direct Investment
FMCL:	Farm Machinery Corporation Limited
FMU/s:	Forest Management Unit/s
FNSP:	Food & Nutrition Security Policy
GAP:	Good Agricultural Practices
GDP:	Gross Domestic Product
GGP:	Great Grandparent
GHP:	Good Husbandry Practices
GNH:	Gross National Happiness
GP:	Grandparent
GVA:	Gross Value Added
HWC:	Human-Wildlife Conflict
IoT:	Internet of Things
LDC:	Least Developed Country
LG:	Local Government
LMIC:	Lower Middle Income Country
MoAL:	Ministry of Agriculture & Livestock
MoESD:	Ministry of Education & Skills Development
MoICE:	Ministry of Industry, Commerce & Employment

MoFAET:	Ministry of Foreign Affairs & External Trade
MoH:	Ministry of Health
MoHA:	Ministry of Home Affairs
MoIT:	Ministry of Information & Transport
NBC:	National Biodiversity Centre
NCAH:	National Centre for Animal Health
NCGS:	National Credit Guarantee Scheme
NCHM:	National Centre for Hydrology & Meteorology
NLCS:	National Land Commission Secretariat
NLRC:	National Livestock Research Centre
NPPC:	National Plant Protection Centre
NRDCL:	Natural Resources Development Corporation Limited
NSB:	National Statistical Bureau
NTB:	Non-Tariff Barriers
OGOP:	One Gewog, One Product
PA/s:	Protected Area/s
PHA:	Potential Harvest Area
PPP:	Public-Private Partnership
PPP:	Purchasing Power Parity
PPR:	Peste des Petits Ruminants
RAMCO:	Regional Agricultural Marketing & Cooperatives Office
RGoB:	Royal Government of Bhutan
RLDC:	Regional Livestock Development Centre
RNR:	Renewable Natural Resources
RoI:	Return on Investments
RUB:	Royal University of Bhutan
SAARC:	South Asian Association for Regional Cooperation
SDG:	Sustainable Development Goals
SMS:	Short Message Service
TCB:	Tourism Council of Bhutan
TVET:	Technical & Vocational Education & Training
WTO:	World Trade Organization

CHAPTER I: PREMISE

1.1 THE VALUE PROPOSITION

The agrifood sector remains pivotal to the security and well-being of Bhutan. By refocusing interventions, boosting exports, fast-tracking commercialisation, diversifying markets, empowering farmers and the private sector, and strengthening existing foundations, the Agrifood Sector Strategy 2034 (AFSS 2034) aims to build a high-performance sector which provides for abundance, spurs economic growth, creates jobs, ensures the achievement of the Sustainable Development Goals (SDGs) and maximises Gross National Happiness (GNH). It aims to build a nimble and adaptive sector, which is resilient to environmental and social shocks, amplifies the provision of gainful employment, and empowers women, children and marginal groups.

Refocusing Interventions, Boosting Exports, Fast-tracking commercialization, Diversifying markets, Empowering farmers and Private sector

The AFSS 2034 builds on the aspirations outlined in the Food and Nutrition Security Policy of Bhutan, 2023 (FNSP 2023). The FNSP 2023 was formulated following extensive consultations conducted across Bhutan covering all stakeholders. Based on a solid understanding of current challenges, and recognizing opportunities, this forward-looking policy framework spells out, in clear details, the aims, objectives and priorities for Bhutan's agrifood sector. It brings much needed focus, and will help all stakeholders to maximise efficiency in delivering transformation. The FNSP 2023 identifies priority crops and livestock produce to ensure increase in farm incomes, and spells out the need to ramp up support systems. For instance, in the FNSP 2023, it targets the expansion of climate resilient irrigation systems to cover 57 percent of wet land, up from the current 29 percent. It calls for repurposing agriculture subsidies; stepping up pest and disease control; minimising crop and food loss and waste; and recognizes climate change as a key threat for the agrifood sector. Research and development has been accorded highest importance in the FNSP 2023 with focus on science and technology generation. Thus, the policy stipulates that at least 1 percent of agrifood sector GDP be ploughed back for

1 Percent of Agrifood sector GDP be ploughed back for Research and Development

research and development. The policy also calls for increased gender equality and social inclusion, and enhanced partnerships amongst stakeholders. Importantly, it provides a clear policy pivot to radically increase farm incomes, expand commercialization, and secure markets.

The AFSS 2034 is also cognizant of overarching national goals to transition to a high-income country by 2034. GDP is expected to grow to USD 10 billion by 2034 from current levels of USD 2.5 billion, and per capita GDP is targeted to be raised to 12,000 USD from 3,300 USD at present level. The agrifood sector is expected to contribute significantly towards meeting these goals. Furthermore, the AFSS 2034 intends to ensure that the agrifood sector contributes to the SDGs and Bhutan's concurrent commitments to international obligations.

According to the Third National Communication to United Nations Framework Convention for Climate Change (UNFCCC) 2020, Bhutan's agricultural sector is crucial for addressing climate change, contributing 14.5 percent of national greenhouse gas (GHG) emissions in 2015. Mitigation measures outlined in Bhutan's Second Nationally Determined Contribution (NDC) and Low Emission Development Strategy (LEDS) for Food Security include transitioning to organic fertilizers, reducing continuous rice flooding, improving cattle productivity, and promoting domestic biogas production. Additionally, carbon sequestration efforts focus on enhancing soil health through sustainable practices and expanding perennial crop production. These initiatives, aligned with Bhutan's Gross National Happiness principles, support food security, economic recovery, and the country's commitment to carbon neutrality, with implementation timelines extending to 2050.

Support food security, economic recovery and country's commitment to carbon neutrality through reduced GHG emission

Adaptation measures aim to address agrifood sector's vulnerability to extreme weather events, pests, and diseases, which threaten food security and livelihoods. Key strategies include mapping vulnerable farming communities, strengthening research and extension services, introducing climate-resilient crops, and expanding sustainable irrigation systems. These actions are designed to mitigate risks, improve agricultural resilience, and ensure sustainable productivity in Bhutan's challenging landscape.

The Strategy remains cognizant of baselines and constraints in terms of production, human and institutional capacity, and acknowledges the complexity and fragility of the agrifood sector. Despite inherent and entrenched challenges, the strategy intends to harness unrealised potential, power and possibilities in the sector.

Vision:
All people living in Bhutan have the means at all times to have physical, economic and social access to diverse, safe and adequate nutritious food for a healthy, active and productive life.

Mission:
To accelerate transformation and innovation within the agrifood sector to radically expand exports, meet national goals of food and resource security, and realise significant and substantive socio-economic dividends in the coming decade and beyond.

Goals:
By 2034, the agrifood sector will:

- Significantly contribute to Bhutan's economy through trebling exports, enhancing commercialisation, adoption of technology, scaling up support to the private sector, value chain building, increasing internal commerce, enhancing export value of agriculture and livestock products, and harnessing of big data.
- Enhance the agricultural sector's annual contribution to Gross Domestic Product (GDP) growth rate by focusing on high value crops and livestock production.
- Triple incomes of farmers and agrifood sector employees by 2034 thereby increasing the provisioning of meaningful, dignified and well remunerated employment.
- Ensure that all Bhutanese households are food secured either by producing their own food or having means to buy their food.
- Proactively mitigate carbon emissions and continue to ensure the persistence of nature, biodiversity and ecosystem services.

1.2 THEORY OF CHANGE

Conventional agriculture has served well for over the past half a century. Moving forward, recognizing the complexity of the challenges and taking note of increasing opportunities, there needs to be a radical shift in our approach to delivery and performance within the agrifood sector.

Performance, innovation and development within the agrifood sector needs to be promptly upscaled to keep pace with rapid changes in demography and consumption patterns. Over the last few decades, despite modest increases in production of key commodities and

sustained support to smallholder farmers; imports, both of essential items as well as packaged goods, have witnessed exponential growth. On the contrary, incomes of smallholder farmers have not witnessed significant growth thereby leading to reduced farm labor through increased rural-urban migration and a gradual loss of vitality within rural farming landscapes. Exports on the other hand have witnessed very negligible growth.

Through specific, focused and targeted interventions over the coming decade, extant conditions will be improved to triple incomes of farmers and those employed in the agrifood sector, and transform Bhutan from a deficit to a food secure nation. The following major shifts are foreseen.

- Transition from subsistence/small-scale operation to large-scale efficient commercial farms.
- Transition from manual operations to mechanisation with increasing adoption of cutting edge agro-technology.
- Shift from conventional low-value crops and livestock to high-value crops and livestock produce.
- Expand from traditional domestic markets and export market (such as India, Bangladesh) to capture upcoming domestic institutional markets (such as high-end hotels, Gyalsung institutions, schools, hospitals, monastic institutions, Gelephu Mindfulness City (GMC), and export markets like Singapore, Thailand, Dubai).
- Shift incentives from input-based subsidies to output or outcome-driven subsidies.
- Converge resources and focus on selected prioritised crops and livestock products for enhanced food and nutrition security.
- Transition from public sector heavy commitment to greater private sector engagement.
- Shift from intuition-based interventions to evidence-based science and research approaches.
- Prioritise market diversification and establish reputation for Bhutanese products through organic certification, GI registration, narration and storytelling, and branding.
- Place emphasis on productivity in addition to production.

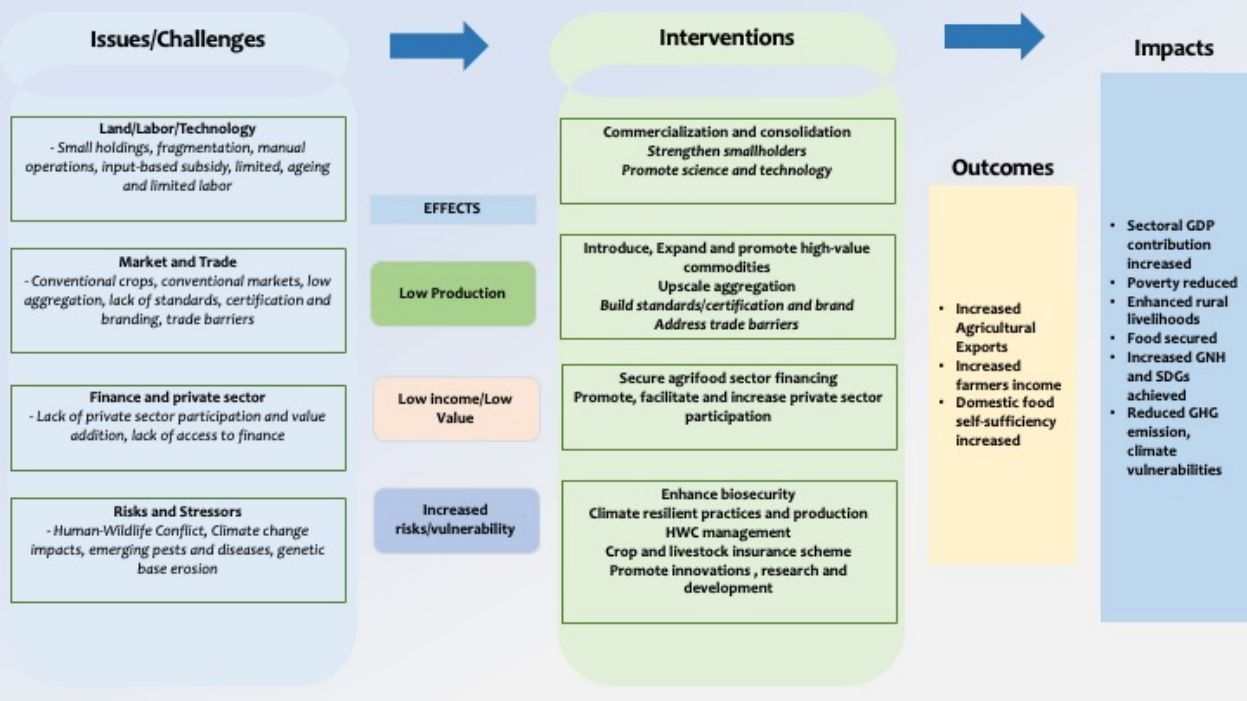


Figure 1. 'Theory of Change' proposition for the agrifood sector

1.3 PRINCIPLES

The agrifood sector strategy 2034 seeks coherence and alignment with broader national trajectories and intends to renew focus, attention and efforts towards transforming Bhutan's agrifood sector. The strategy remains cognizant of Bhutan's income levels, employment and demographic trajectories (Figure 2) and recognizes the critical role the agrifood sector plays within Bhutan's broader socio-economic domain.

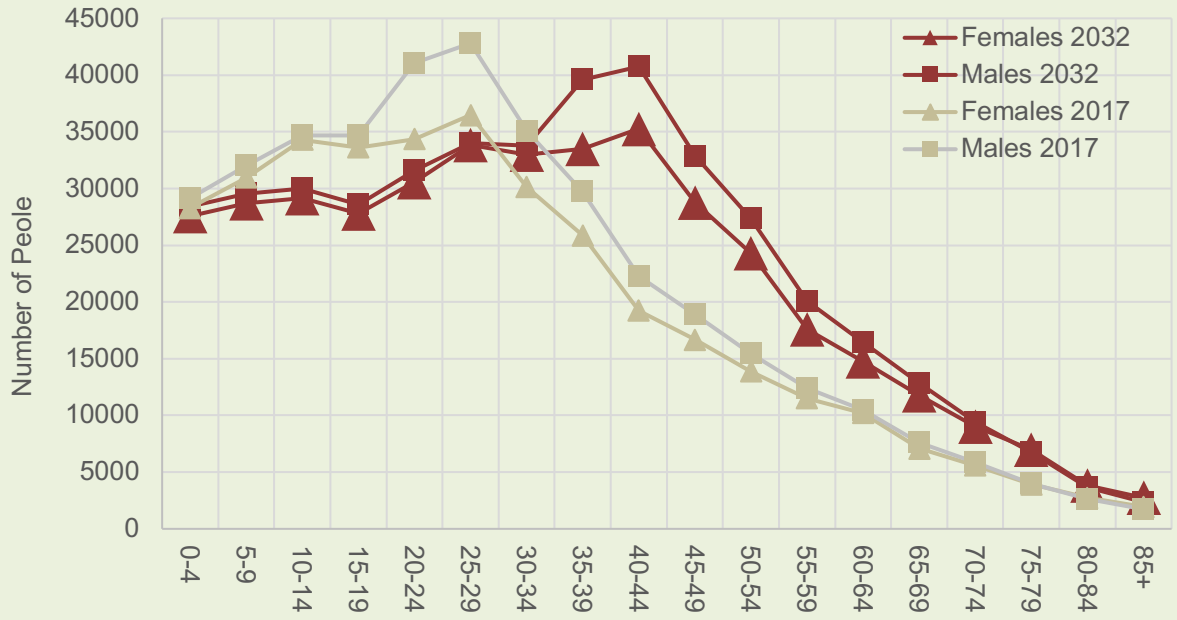


Figure 2. Population of Bhutan by age and sex (in 2017, and projection for 2032)[1]

The Strategy subscribes to the following overarching principles:

- To render food and feed Affordability, Availability and Accessibility (3As).
- To scale up the agrifood sector's potential to deliver on SDGs and other global commitments.
- To build a climate resilient and sustainable agrifood sector.

[1] Data from the National Statistical Bureau (NSB) of Bhutan (www.nsb.gov.bt)

It further notes the opportunities provided by increasing physical and digital connectivity and access to clean and reliable energy and rapidly evolving technology.

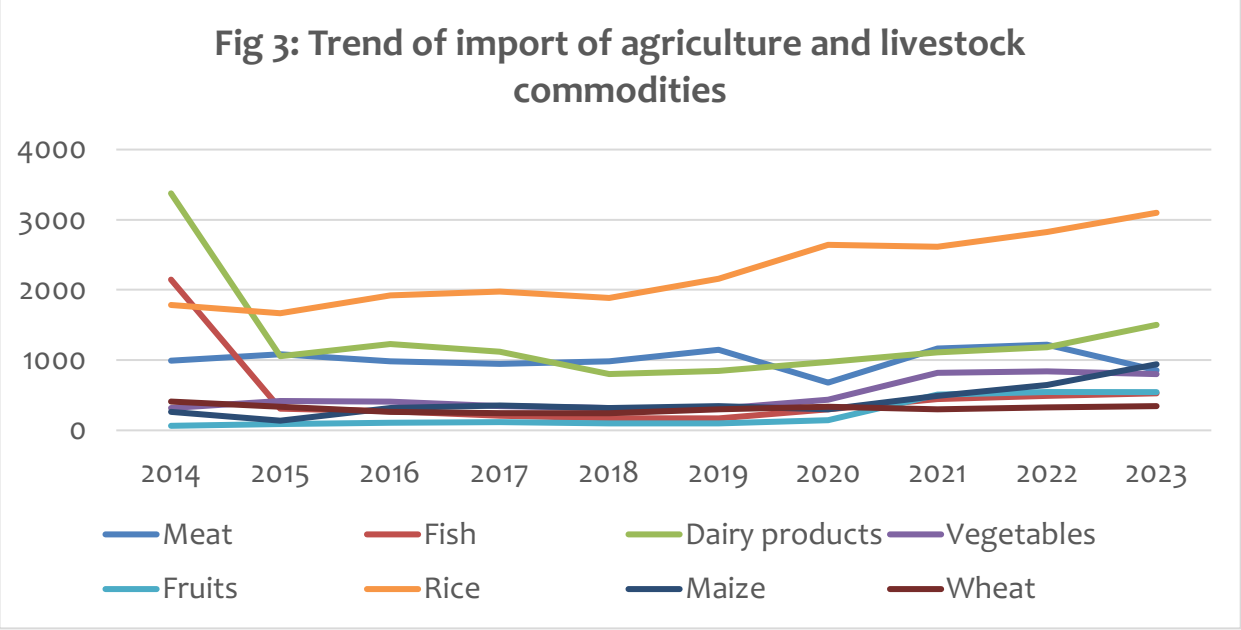
Attention is also paid to the need for realigning policies and addressing trade-related bottlenecks to reap exponential dividends from the agrifood sector. In particular, this strategy intends to bring about a transformational impact to the people of Bhutan through tripling of agri export revenue and augmenting the nation's long-term plan to increase per capita income.

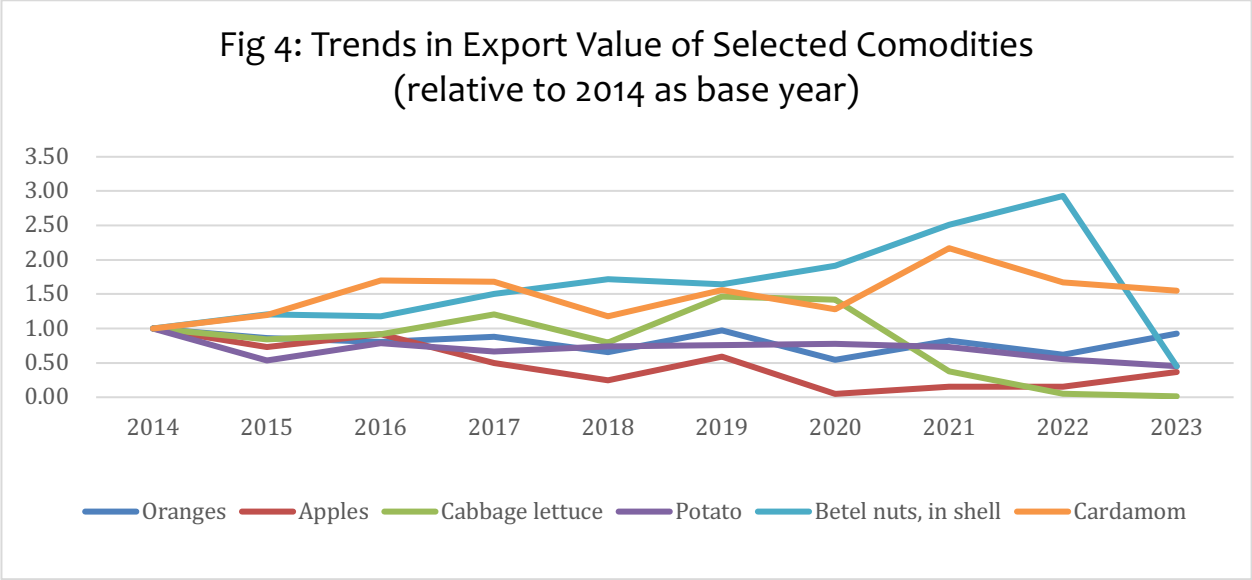
Affordability, Availability, Accessibility of Food

The strategy also notes, with grave concern, the urgent need to address the issue of climate change and human-wildlife conflict. It further recognizes Bhutan's graduation from a Least Developed Country (LDC) to a Low Medium Income Country (LMIC) and calls for the need to step up and accelerate interventions within the sector.

1.4 SUMMARY OF KEY CHALLENGES

Bhutan has witnessed rapid development in recent decades. Per capita GDP has grown over tenfold, from as low as 330 USD in the 1980s, to 3,919 USD as of 2023. These achievements have mostly been realised through investments in hydropower and growth in the tourism sector. Bhutan's population has almost doubled from about 400,000 in the 1980s to almost 727,145 in 2017, and is projected to grow by another 100,000 by 2032. Given this growth, imports have risen significantly (Figure 3) while exports have failed to witness significant growth (Figure 4).





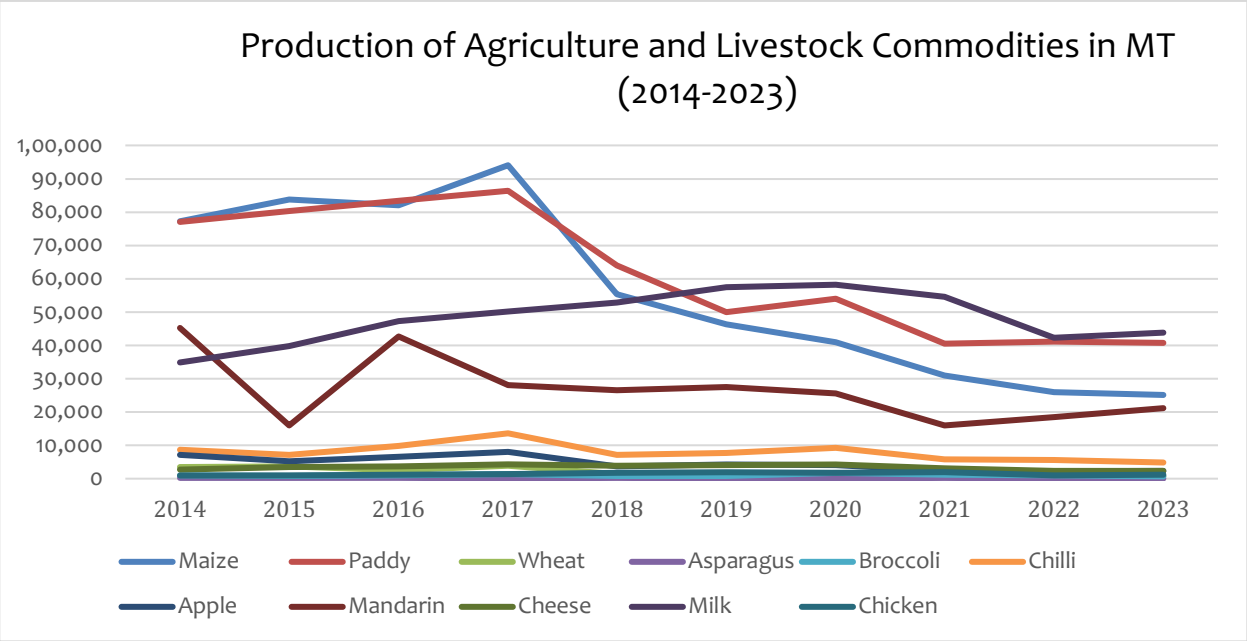
Inherent structural and systemic challenges related to small and scattered land holdings (minimal inputs and low mechanisation possibilities continue to result in high production costs and limited yield.

Given continued rural-urban migration, particularly of youth, farm labor has become increasingly scarce, aged and feminised. This is exacerbated by emigration and the perception of farming as an unattractive or less desirable profession. As reported in the Population and Housing Census of Bhutan 2017, 21.7 percent of the population has moved to urban centres, leaving agricultural land fallow and villages with 4,800 *gungtongs* (empty households). Moreover, from 2013 to 2022, Bhutan's agricultural workforce decreased by approximately 33.7 percent from 188,759 to 125,160, highlighting a significant reduction in labor availability (See Table 1).

Sector	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture	188,759	192,536	200,102	198,429	175,859	162,239	159,032	157,015	158,511	125,160
Industry	-	-	-	30,137	40,960	34,542	43,550	42,438	45,560	39,414
Service	-	-	-	118,564	125,952	103,660	108,478	115,109	118,052	123,210
All Sectors	335,870	339,569	344,294	347,130	342,771	300,442	311,059	314,562	322,122	287,785

Table 1: Population of employed persons by sector (2013-2022)

Currently, total food is produced from less than 2.96 percent of cultivated land, and less than 29 percent of wetland is irrigated[2]. Given persistent crop (19-43 percent of the annual household production) and livestock (493 numbers) lost to wildlife conflict, pests and diseases in the past decades[3], almost 28 percent of arable land is currently left fallow[4]. Yields for almost all crops and livestock produce remain below regional averages and most crop and livestock production has declined over the past decade (See figure 5).



Production and marketing of agricultural commodities continues to be constrained by small land holdings, scattered settlements, low volume, seasonal production, high transportation costs, high post-harvest losses, inefficient domestic market linkages and limited export market diversification. Furthermore, inadequate aggregation centres, sorting, grading, storage and processing facilities, lack of proper pack-house at entry and exit points, limited standardisation, weak quality control and limited capacity for conformity assessments such as inspection, testing and certification, and insufficient market facilities are some of the major constraints grappling agricultural marketing both for domestic and export markets. Majority of the businesses in the agrifood sector are cottage and small scale.

Post-harvest loss remains high and value-chain infrastructure, marketing logistics, and compliance to quality standards remain infantile. For instance, post-harvest loss for rice in 2020 was 5.5 percent of the total production (Tshering et. Al, 2019), while post-harvest

[2] Food and Nutrition Security Policy of Bhutan 2023

[3] NPPC, 2024

[4] Calculated as per figures provided in the Food & Nutrition Security Policy of the Kingdom of Bhutan 2023

handling loss for fruits such as mandarin and apple was found to be about 55 and 67 percent respectively (SDF, 2023). In particular, private sector participation is low and inconsequential. Given all these, diets, particularly in remote areas, remain nutritionally poor. As of 2023, 17.9 percent of children under five years of age remain stunted, 5.1 percent are wasted, and 8.7 percent underweight[5]. There is also continued prevalence of vitamin and iron deficiency. Food related waste remains high and the agrifood system is responsible for almost 15 percent (552 Gg of CO_2e) of Bhutan's GHG emissions[6].

High imports, Low Exports, Feminization, HWC, Climate change, Pests and diseases, Post-harvest loss, lack of standards and certification, Agricultural marketing and logistics

The agrifood sector in Bhutan faces significant challenges due to climate change, which threatens food security and rural livelihoods. Extreme weather events such as flash floods, droughts, hailstorms, and windstorms have become more frequent, damaging crops, livestock and infrastructure. The mountainous terrain and limited arable land exacerbate these vulnerabilities, making it difficult to expand agricultural production. Moreover, rising incidences of pests and diseases further strain the sector, increasing the risk of crop failures, livestock losses and reducing yields. Climate modelling studies predict slight to moderate declines in staple crops like maize and rice, while only a few, like potatoes, may benefit from changing conditions.

These challenges are compounded by Bhutan's reliance on traditional farming practices, limited access to modern technologies, and inadequate irrigation infrastructure. Limited resilient crop varieties and insufficient capacity for research and extension services further hinders adaptation efforts. These issues pose a serious threat to the livelihoods of Bhutan's population, who depend on agricultural sector, and to the country's goal of achieving food self-sufficiency.

1.5 MOTIVATION & OPPORTUNITIES

Bhutan intends to double its GDP from the USD 2.5 billion at present to USD 5 billion by 2029. This aspiration builds on attainment of food self-reliance. The goal is to increase the value of exports by threefold from Nu 3 billion to Nu 9 billion by 2034.

[5] As reported in the National Health Survey Report 2023, Ministry of Health, Bhutan

[6] Kingdom of Bhutan – Third National Communication to the UNFCCC. RGOB. Thimphu, Bhutan, 2020

The Strategy draws upon eight National Pathways for transforming Bhutan's food systems which was submitted to the UN Food Systems Summit and syncs with priorities laid down in the FNSP of Bhutan 2023, providing the required policy framework to expedite implementation of this Strategy. This strategy guides other relevant sectoral strategies such as National Biodiversity Strategies and Action Plans (NBSAPs), Low Emission Development Strategy for Food Security, RNR Marketing Strategy etc.

Reap full dividends of innovation, focus and renewed investments for yield improvements, technology adoption, commercialization, value chain development and export diversification

The agrifood sector retains opportunities for impact and remains consequential for Bhutan. The sector provides direct employment to 43.5 percent of the total employed and contributes to over 14 percent of GDP in 2023. Given Bhutan's varied agro-ecological zones, which allow for a variety of food commodities to be produced under a pristine environment, there are opportunities to substantially increase incomes and improve livelihoods of a majority of Bhutanese by transforming the agrifood sector.

Achievements thus far indicate prospects for immediate further growth and impact. There has been notable increase in quantitative crop and livestock yield resulting in the increase of agrifood sector's Gross Value Added (GVA) contribution from Nu. 10 billion in 2010 to Nu. 37 billion in 2023. Food self-sufficiency measures have increased to 98.5 percent in 2022 as compared to 97.3 percent in 2017[7]. This can be correlated to the renewed policy emphasis on enhancing food and nutrition security with improved input services and investment in critical infrastructure development across the entire value chain.

However, Bhutan's agrifood sector is yet to reap the full dividends of innovation, focus and renewed investments. Considerable scope remains for yield improvements, technology adoption, commercialization, value chain building, diversification of exports, employment generation, and improvement of smallholder livelihoods. Sustained and focussed interventions will positively influence outcomes related to trade balance, incomes, employment, empowerment, nutrition and self-reliance goals. It will also ensure that Bhutan effectively adapts to climate change and remains on track to achieve the SDGs.

1.6 Risk Analysis and Mitigation Measures

The agrifood sector in Bhutan plays a critical role in the nation's economy, providing employment to a large portion of the working population. It employs 43.5 percent of the total labor force. Bhutan's agrifood sector still heavily depends on traditional farming methods,

[7] Bhutan Living Standards Survey (BLSS 2022) published by the National Statistical Bureau (www.nsb.gov.bt)

which often involve low-input, low-output techniques. These practices are typically labor-intensive and are highly vulnerable to changing climate conditions, pests, and diseases.

The agrifood sector's contribution to Bhutan's GDP is relatively low with only 14.67 percent, despite the fact that agricultural sector employs a significant portion of the population. Additionally, Bhutan's agrifood products face challenges in accessing both domestic and international markets. Domestic markets are often fragmented, and competition from imported goods undercuts local produce. The agrifood sector in Bhutan is experiencing an aging workforce, with younger generations migrating to urban areas or seeking employment in the service and industrial sectors. The labor force in agriculture is therefore dwindling, and there is a lack of skilled workers to adopt modern farming techniques.

SL No	Risks	Implications	Mitigation Measures
1	**Low Economies of Scale**	1. *Higher production costs* 2. *Limited access to markets* 3. *Increased vulnerability*	1. *Encourage cooperatives or farmer groups* 2. *Promote agri-business clusters* 3. *Support the establishment of contract farming arrangements* 4. *Promote large-scale commercial farming*
2	**Reliance on Traditional Farming Practices**	1. *Low productivity and inefficiency in resource utilization* 2. *Environmental degradation* 3. *Vulnerability to climate change*	1. *Introduce modern farming technologies* 2. *Provide training and extension services* 3. *Establish climate-smart agricultural practices*
3	**Decreasing Contribution to GDP**	1. *Economic marginalization of the agrifood sector* 2. *Limited diversification of income for rural populations* 3. *Decreased resilience to external shocks*	1. *Increase investment in agricultural research and development (R&D)* 2. *Foster public-private partnerships and FDI attraction* 3. *Advocate for agriculture-focused policies*
4	**Market Access and Export Challenges**	1. *Reduced profitability due to limited market access* 2. *Poor international market integration* 3. *Dependence on imports*	1. *Develop marketing strategies* 2. *Improve logistical infrastructure* 3. *Expand trade agreements and partnerships* 4. *Market Diversification*
5	**Labor Shortages and Aging Workforce**	1. *Reduced productivity, inefficiency, and an inability* 2. *Low capacity or inclination to adopt new technologies* 3. *Social and economic impacts in rural communities*	1. *Incentivize youth participation in agriculture* 2. *Increase Farm Mechanization* 3. *Develop youth-focused agribusiness initiatives* 4. *Seasonal foreign labor import*

CHAPTER II: THE STRATEGY

2.1 ACCELERATE TRANSITION TO COMMERCIALIZATION

While the support to enhance livelihood of smallholder farmers continue, it is prudent and timely to repurpose the support to prioritise production of high-value crops and livestock products and commercialization of the agrifood sector.

2.1.1 DIVERSIFY MARKETS

Bhutan's agrifood exports have plateaued over the years. Key crops such as cardamom, ginger, potatoes, mandarin and apple, have not kept pace and did not retain farming populace, realising only limited benefits to the farming communities. Export from the livestock sector is negligible. ***Strategic interventions will prioritize market diversification, address trade-related barriers and promote the ease of doing business and other systemic improvements while capitalizing on the potential of the domestic market.***

2.1.1.1 EXPLORE EXPORT MARKETS

Promoting agricultural exports is a crucial strategy to increase production, generate income, reduce poverty, strengthen food security, and stimulate economic growth. At present, exports are limited and primarily focused in India and Bangladesh. However, there is substantial potential in these existing markets as well as in emerging ones, including Singapore, Australia, Thailand, the Middle East, Japan, and Malaysia. These markets show strong demand for high-value, low-volume products such as asparagus, broccoli, ginger and turmeric powder, chilli, fresh fruits, and rainbow trout.

Air freight will be explored and piloted for Bhutanese produce to assess economic feasibility, with plans for scaling up based on results. Cargo freight carriers and new railway ports will be utilised to expand agrifood exports. ***Market opportunities will be explored in key cities, including Dubai, Singapore, Bangkok, Delhi, Kolkata, Mumbai, and Dhaka, as well as in countries such as Malaysia, Japan, Germany, and Australia.***

Emphasis will be placed on leveraging and capturing the fast growing and expanding regional market. There is huge potential to tap as yet non-targeted markets for Bhutan's organic and high-value food products in a rapidly growing, health-conscious and high-end consumer population in India and Bangladesh. India alone will have the third-largest number of high-income households in the world by

2034 and will have a shortfall of around 42 million tonnes of vegetables and fruits.

Within the region, in the short term, Bhutan will build on existing trade partnership frameworks including mutual recognitions to expand trade with markets such as Singapore, Thailand and United Arab Emirates (UAE).

Similarly, ***opportunities for duty quotas to Japan and the EU will be pursued for export of Bhutanese products.***

To further build on to the existing initiatives to brand Bhutan as a champion in sustainable development, markets for Bhutanese-origin agrifood products with special characteristics linked to its geographical origin will be expanded. The Geographical Indication (GI) system will be established and operationalized in collaboration with the Department of Media, Creative Industry and Intellectual Property (DoMCIIP). ***Potential GI products in the agrifood sector will be mapped and GI registration will be promoted.*** This initiative aims to protect the authenticity of Bhutanese agrifood products, open up premium market opportunities, and support sustainable agriculture, while preserving Bhutan's agricultural heritage.

2.1.1.2 LEVERAGE DOMESTIC MARKETS

Given the extent of imports, Bhutan's domestic market remains to be tapped. There is significant demand from institutions such as Gyalsung Academies, schools, hospitals, and monastic institutions. Mass gathering such as religious events also provides domestic markets.

Bhutan's policy of high-value, low-volume tourism has positioned the country as one of the world's most exclusive travel destinations. From January 1 to March 31, 2024, Bhutan welcomed 25,003 guests compared to 12,696 arrivals in 2023 during the same period. There was 97 percent increase in guest arrivals to Bhutan from January to March 2024 (Department of Tourism, April 2024). With tourism expected to continue growing in the coming years, there is a significant opportunity for the agrifood sector to capitalise on the growing tourism industry, aligning with the hospitality sector's increasing demand for high-quality, locally sourced food products. Strengthening the domestic market will position Bhutan as a destination renowned for safe, high-quality food, thereby complementing and enhancing the country's broader tourism growth.

Further, the upcoming GMC as a hub for sustainable development and mindful living will offer a significant market opportunity for domestic agrifood produce and is expected to become a key destination for high-quality commodities from Bhutan. ***A separate agriculture and livestock development plan tailored to the distinct need of city will be developed and implementation fast tracked.***

- ***Implement National Institutional Feeding Programme***

A collaborative initiative will be developed on a priority basis between the Ministry of Education and Skills Development (MoESD), Ministry of Health (MoH), monastic bodies, the Gyalsung Secretariat and the MoAL to cater to the dietary needs of these institutions. This exercise will start by jointly assessing year-round demand based on predetermined school meal plans[8] to ensure balanced, diverse and nutritious meals for all school children, hospital patients, and cadets under the Gyalsung Academy. ***Inter-ministerial efforts will be made to increase food stipends to enhance affordability of nutritious local commodities.*** Wherever possible, and as much as feasible, efforts will be made to source local produce from farms and producers close to these institutions. ***Key commodities such as eggs, milk, cheese, butter, fish, vegetables and cereals will be prioritised for production for destined domestic markets.*** Additionally, efforts will be made to revamp School Agricultural Programme (SAP) in collaboration with relevant agencies.

- ***Meet Growing Demands from Urbanization***

From the total population, about 49 percent will be residing in the urban areas and the requirement for food is projected to be 141,976 MT of cereals, 68,678 MT of vegetables, 40,278 MT of milk, 2,451 MT of meat and 97 million eggs annually by 2034.

With subsequent rise in income and ushered change in mindful consumption habits, the demand for fresh and convenient food products will increase as the urban population increases. Supply chains from primary production hubs to urban consumption centres will be streamlined and efforts will be made to project demand and schedule production. Moreover, ***peri-urban and urban farming initiatives will be promoted to enhance local food production and consumption, contributing to the self-sufficiency and improved nutrition of urban populations.***

2.1.2 BUILD REGULATIONS, STANDARDS AND COMPLIANCE

For accelerated transition of the agrifood sector into a more commercialised and competitive industry, ***it is essential to establish a sound legal framework of regulations, standards, and compliance mechanisms across the value chain.*** Existing legal frameworks governing the various aspects of agriculture, food production, food safety, trade, and environmental sustainability will be reviewed and necessary interventions made to ensure that an operational import and export control system are embedded within the legal framework. These components not only ensure the quality and safety of produce but also foster consumer trust, enable market access, and encourage investments in the sector.

[8] See http://www.schoolfoodplan.com/.

2.1.2.1 BUILD REGULATIONS AND STANDARDS ALIGNED WITH INTERNATIONAL BEST PRACTICES

The interaction between the law, sustainable agrifood systems and healthy diets relies on international as well as national legal instruments. Legislative interventions can be used as an important tool to drive agrifood systems transformation. Exports must always conform with the official requirements imposed by the government of the importing country (mandatory requirements), and with the commercial requirements of the importer (purchaser's requirements). The sanitary and phytosanitary controls and technical regulations and standards vary from one country to another. Currently, the regulatory and standards framework in Bhutan's agrifood sector operates in isolation, with different components functioning in silos rather than as an agrifood systems approach. This limited coordination hinders efficiency, consistency, and the ability to meet global standards, ultimately hampering the sector's potential for growth and global competitiveness. As a signatory to international organisations like the Codex Alimentarius Commission (CAC), the World Organisation for Animal Health (WOAH), and the International Plant Protection Convention (IPPC), as a minimum, ***Bhutan will align its regulatory and standards requirements in the agrifood sector with these globally recognized norms.*** These regulations guide producers in minimising health risks, preventing contamination, preventing pest risks, and reducing environmental damage, thereby contributing to sustainable food systems. By adhering to these standards, Bhutan will not only ***strengthen its position in international trade but also enhance food security, protect one health (human, plant, animal and environmental health), and promote sustainable agricultural practices.***

2.1.2.2 FACILITATE COMPLIANCE TO REGULATIONS AND STANDARDS

Facilitating compliance with regulations and standards set in the agrifood sector is essential to ensure consistency in the quality of products and to create a more transparent, efficient, and competitive agrifood sector that benefits producers, consumers, and the environment at large. Adhering to regulations in the agrifood sector is fundamental for ensuring that food production is both safe for consumers and environmentally sustainable. ***Capacity building initiatives including hands-on training will be provided to all actors in the value chain to facilitate agrifood businesses' compliance to regulatory requirements and quality standards, which is crucial for accessing both domestic and international markets, especially given the consumers' demand for safe and high quality products.*** Compliance protects public health and also promotes responsible agricultural practices that benefit the planet. Further, it helps mitigate legal and financial risks for businesses by reducing the likelihood of penalties, recalls, and reputational damage.

2.1.2.3 UNDERSTAND THE REQUIREMENT OF SPECIFIC EXPORT MARKETS

Quality is a prerequisite for successful market access and for improving the competitiveness of agribusiness exports. However, meeting technical requirements is a challenge for many exporters, especially in view of the proliferation of standards. Trading partner countries impose a growing number of standards to protect the health and safety of their citizens and to meet demands of buyers for their specific needs. Enterprises intending to export their products need up-to-date information about the applicable technical requirements, both voluntary and mandatory, in their target markets. ***A systematic approach will be followed to facilitate in understanding the requirements of specific export markets*** and will include conducting in-depth market research, learning about importing country regulations, understanding tariffs and taxes, evaluating logistics and supply chain requirements. Thorough research, compliance with regulations, and establishing the right partnerships are key to building a sustainable and profitable export business. After understanding the requirements of a specific export market for the specific product, ***enterprises will be made to adapt their products and processes to satisfy export market requirements and demonstrate compliance with them.***

2.1.2.4 SUPPORT ADVANCEMENT OF QUALITY INFRASTRUCTURE

Standards and quality increasingly shape commercial prospects for developing and transition economies. The quality infrastructure encompasses the systems and processes that ensure products meet regulations and standards, including standardisation, inspection, testing, certification, calibration and accreditation; it is necessary to provide acceptable evidence that products and services in the agrifood sector meet defined requirements, whether these are imposed by the relevant competent authorities or the marketplace. ***Support will be provided for the advancement of quality infrastructure in the agrifood sector to improve its competitiveness and enhance market access.*** Regulations and standards will be developed in harmony with best international practices, infrastructural and human resource ***capacities for inspection, testing and certification will be upgraded based on the requirements of export markets,*** capacity building and training programs for actors in the value chain will be prioritised to ensure market requirements are consistently fulfilled.

2.1.2.7 STRENGTHEN BIOSECURITY

Enhancements will be made on technological, testing and analytical laboratories, surveillance and containment capacities to safeguard crops, feed and livestock, against both established and emerging pests and diseases. This effort will encompass the expansion of pest and disease diagnostic and surveillance capabilities, alongside the establishment and reinforcement of testing, tracking, and risk mapping measures.

Furthermore, ***farms' structural designs will be incorporated with biosecurity attributes, with incentives or subsidies extended to***

encourage and support the integration of these features. Oversight will be exercised over farmers' adherence to such biosecurity requisites, ensuring their implementation and adherence to the requirements.

The pursuit of ***biosecurity mandates will be viewed as a collective responsibility, involving farmers, agri-product vendors, technical agencies, and regulators.*** Mechanisms will be established to monitor and stocktake risks at regular intervals and respond to outbreaks as and when required.

2.1.2.8 ADDRESS TRADE BARRIERS EXPEDITIOUSLY

Since export of commodities from Bhutan is planned to offset the imports, considering the layers of tax imposition on Bhutanese exporters, the MoFAET, MoICE and MoAL will explore areas to help exporters ease the process and optimise profit from agricultural exports.

Similarly, the ***frameworks for trade negotiations with India and other trading partner countries will be mainstreamed*** as annual programme activities of the MoFAET, MoICE and MoAL, and agenda items related to import/ export lists, and entry/exit ports will be annually agreed upon for the forthcoming year.

Although Bhutan and India have free trade agreements, due to NTBs, Bhutanese exporters often face numerous challenges in meeting the sanitary and phytosanitary requirements imposed by the importing countries. The challenge is heightened with limited authorised ports for export of commodities to India. NTBs are measures other than customs tariff that act as barriers to trade. The government of India, during a bilateral Foreign Ministers' meeting in April 2022, have agreed to resolve all NTBs[9].

Market entry to third countries under preferential trade agreement will be prioritised. On-going trade related initiatives and negotiations with Thailand, Singapore and UAE will be prioritised and expedited.

Bhutan's renewed commitment to resume negotiations for WTO accession calls for a thorough evaluation of Bhutan's agrifood sector's strengths and vulnerabilities. Importantly, ***mutual agreements for duty/ tax free agricultural produce export to targeted countries will be resolved and finalised as 'bilateral trade agreement' deals.***

2.1.3 PRODUCE EXPORT COMMODITIES

Production of export commodities includes crops and livestock commodities having the potential to increase the income of farmers and export revenue generation. Under this, ***both the emerging high value commodities and the existing export commodities will be upscaled.*** Where feasible, ***commercial production of niche and high value commodities at a landscape***

[9] Kuensel, 13 May 2022

level will be promoted for economies of scale.

2.1.3.1 HIGH VALUE COMMODITIES

To boost farmers' incomes and contribute to the country's economic growth, the Ministry will prioritise the cultivation and production of high-value agricultural products. By focusing on quality and scaling production, this strategy aims to meet the increasing demand from a range of emerging international markets.

- ***Promote, Prioritise & Grow high value Crops***

Technical and financial support will be provided for the prioritised high value commodities such as **asparagus, strawberries, broccoli, quinoa, black pepper, buckwheat, cardamom, mushroom and millet.** Accordingly, the investment plans will be developed for the priority products stipulating input requirements, market projections and return on investments.

Given the inability of smallholder producers to meet targets, plans will be specified to supplement production ***through integrated approach of collective smallholder farming, promotion of commercialization on a large scale through use of efficient modern technology and private sector engagement.*** Emphasis will also be accorded on upscaling climate protected production systems; strengthening of post-harvest storage, processing, packaging and aggregation facilities; building of standards; and facilitating robust distribution and marketing channels. ***Major investments will be made across infrastructure development, technology adoption, equipment and input procurement, capacity building, and transportation.***

- ***Expand commodity-based landscape level organic farming***

The ministry will pursue production of priority organic crop and livestock commodities at a landscape level for niche and high-end markets. All such initiatives will be supported by strengthening organic regulations, standards and certification systems to meet the specific market requirements. ***The capacity of farmers and the agriculture value chain actors will be strengthened to enable them to meet the organic requirements.*** In order to enhance production and availability of critical organic inputs including seeds and feeds, biofertilizers, bio-pesticides, ethno-veterinary medicines and food processing aids at affordable rates, ***appropriate fiscal and monetary incentives will be devised.***

- ***Promote, prioritise & produce high-end specialty livestock products***

In order to increase GDP and boost income of farmers, 12 high value livestock products will be promoted for exports which includes **black caviar (Sturgeon), blossom honey, rainbow trout, red caviar (Trout), yagyu meat and yak cheese (Tomme, Gomdel and Caciocavallo).** Investment plans will be immediately developed and support ramped up for the mentioned priority list of livestock products.

In addition, **Royal Jelly, Comb Honey, Pot Honey (putka), Yak Fibre, Chevon, and Cage Free Eggs** will be promoted.

2.1.3.2 SUPPORT EXISTING EXPORT COMMODITIES

Support for established export commodities such as **apple, mandarin, cardamom, areca nut, ginger, potato, and legumes** will be provided to ensure stability until emerging products achieve market penetration and become established commodities.

2.1.4 FAST-TRACK COMMERCIALIZATION & PRIVATE SECTOR ENGAGEMENT

Large scale commercial private sector engagement in the agrifood sector is limited. Initiatives and mechanisms to drive up private sector engagement will be accelerated and upscaled. ***Access to finance, land, labor and tax breaks will be enabled to spur the growth of the private sector.***

2.1.4.1 ESTABLISH COMMERCIAL FARMS

Proposals to establish commercial farms will be encouraged and supported on a priority basis. Such commercial establishments may be developed by private entities, farmer groups/cooperatives, and SOEs to undertake large-scale production of prioritised commodities. ***Where necessary and feasible, commercial farms will be established on a turnkey project model and handed over to promising entities including private sectors and entrepreneurs for operation and sustainable management.***

Such farms will adopt technology, implement good biosecurity measures, enhance production, minimise waste and demonstrate best practices. ***FDIs and B2B will be encouraged and facilitated for all such ventures including leasing of land if required.***

2.1.4.2 ACCELERATE PRIVATE SECTOR ENGAGEMENT

Private sector players will be actively engaged to undertake business in the agrifood sector. ***An annual business conclave will be convened to take stock of progress, further opportunities and enhance partnerships.*** Forums such as Bhutan Agrifood Trade and Investment Forum (BATIF) will be held as biennial events to encourage and usher the private sector to achieve the intent of the MoAL in garnering international business/trade partnership. To augment the efforts, ***low interest loans as well as Government guarantees will be provided to encourage private sector players.***

Private sector players ***will be encouraged and supported to establish vertical farms by providing fiscal subsidies, low interest loans, administrative clearances, trade licences, facilitating B2B partnerships and providing tax breaks.*** Such enterprises, given their sophistication, and requirement to dabble with technology, will be viewed positively by Bhutan's growing number of young employment seekers. Given the potential, ***staggered production approach will be implemented to schedule production to year-round cycles*** so that such staggered enterprises help offset seasonal barriers on production.

2.1.4.3 ACTIVELY ENGAGE & SUPPORT YOUTH LED BUSINESS ENTERPRISES

Youth will be proactively engaged and encouraged to undertake agrifood related on and off-farm business. Specific programs focussed on youth skills building will be rolled out. ***Technical support will be provided for youth led farming enterprises and aspiring entrepreneurs.*** Enterprises will also be ***provided special incentive packages comprising subsidies on farm inputs, machinery and equipment, land and infrastructure development.*** Support will be extended to marketing and provisioning of special access to finance. ***Various national, regional and global platforms will be used to leverage youth engagement*** for contribution to agrifood sector transformation.

2.1.5 ADVANCE TECHNOLOGY & INFRASTRUCTURE

Challenges such as rugged terrain, limited mechanization, and persistent labor shortages continue to hinder the development of a resilient and efficient agrifood sector. To address these issues, efforts will prioritize the ***adoption of advanced technologies, use of digital tools and the enhancement of access to essential inputs and infrastructure.*** Targeted investments in innovative solutions, climate-resilient systems, and ***private sector-driven initiatives are anticipated to transform agricultural practices, optimize resource utilization, and promote sustainable growth in the sector.***

2.1.5.1 IMPROVE TECHNOLOGY & SYSTEMS

The strategy will focus on advancing agricultural technology by leveraging digital platforms, enhancing farm mechanization, and piloting next-generation agricultural innovations. These efforts aim to ***integrate modern tools and systems to improve productivity, streamline value chains, and promote precision farming practices.***

- **Upscale farm mechanization**

Farm mechanization remains a challenge due to the limited and high cost of farm machineries. Smallholder farmers and farmer groups/cooperatives will be provided subsidies and ***special financial credits and tax incentives to establish their own machinery and equipment rental services for communities.*** Private sector enterprises will also be encouraged to establish machinery and equipment rental services, and farm shops for inputs, and provide aggregation, storage and primary processing facilities. ***Such enterprises may also be established by youth groups.***

- **Launch agri-solutions, big data & digital platforms**

Big data has the power to positively impact the entire value chain and must be increasingly and urgently harnessed to play a greater role in transforming Bhutan's agrifood sector. ***The big data framework will be increasingly adopted for enhancing real-time decision making for all actors***

along the value chain, as well for stock taking, and adaptive planning.

An agrifood digital platform supported by a high-end data centre will be launched. The platform will incorporate and facilitate the use of an ensemble of digital tools ranging from ***apps which provide weather-based crop advisory services including forecasting of pests and diseases.*** To assist service delivery, such digital platforms will also be designed to support agriculture and livestock extension agents.

Digital tools to collect real time data on farm conditions will also be a part of the package. This will seamlessly allow and empower farmers to seek data on inputs and markets; while aggregators can synchronise produce distribution in the market; and agri-based industries can improve production and value-addition cycles and link to appropriate certification systems required for the different markets based on block chain technology.

Furthermore, ***digital platforms[10 & 11], which connect farmers to markets will be supported through encouraging farmers to register and participate.*** Farmers Groups /Cooperatives/Aggregators, Transporters and digital platform providers, such as SIBJAM[12] and others[13] will be encouraged to proactively link with farmers and ensure efficiencies across the produce value chain.

A nation-wide digital platform such as G2C (Government to Citizen) will be rolled out to help deliver inputs efficiently and also to track and forecast demand. The platform will be integrated into an overarching digital platform for the agrifood sector so that it provides opportunities for efficient service delivery and effective marketing. The ***National Digital Identity framework will be leveraged to ensure timely and reliable services.***

- **Pilot & upscale Next Gen Agriculture and farming**

Opportunities offered by the advent of ***innovations and technologies will be strategically leveraged and adapted.*** This will encompass employment of drone facilities, blockchain and adoption of new farming methods like vertical farming. Additionally, alternative means of cultured meat will be explored.

- ***Pilot Lab Grown Meat***

Encourage and support private sector and /FDI to pilot and establish artificial meat processing facilities by providing ***fiscal subsidies, low interest loans, administrative clearances, trade licences, facilitating B2B partnerships and providing tax breaks.***

- ***Promote Vertical Farms***

Environmentally controlled vertical farming systems will be promoted and upscaled to produce a variety of agricultural and livestock commodities. ***Advanced technologies such as automated***

[10] https://www.sibjam.com/

[11] https://www.greenhands.bt/

[12] See https://www.sibjam.com/

[13] https://www.greenhands.bt/

climate control, precision farming tools, and renewable energy systems will be leveraged for resource optimization, efficiency and sustainability. These efforts will focus on addressing challenges such as limited arable land, water scarcity, and climate variability while supporting innovation and improving food security for a growing population.

- ***Leverage the Dawn of Agri 4.0: IoTs, Drones & Blockchains***

Smart and widely available farm sensors will be deployed to monitor farm conditions related to soil, feeding, and animal health, temperature, relative humidity, moisture, and prevalence of pests and diseases. These sensors can be supplemented with drones equipped with advanced sensor technology to assess crop yield, identify/detect invasive alien species and diseases, and monitor rangeland. All such data can be automatically and seamlessly synthesised within the IoT in real-time. This abundance of analytics will finally allow farmers to engage in precision agriculture by real-time based decision making.

Blockchain technology will be implemented to enhance food safety, and traceability for all agrifood related products. Use of this technology to leverage inspection, testing and certification services will also be explored.

ARDCs and NLRC will be upgraded, and capacity built, to support the rollout and implementation of the agri-sector Big Data framework, which will enable implementation of farm based IoT and related technologies.

2.1.5.2 STRENGTHEN INPUT SERVICES AND INFRASTRUCTURE

The common practices of providing support across a broad array of crops and livestock farming and thinly spreading the limited resources, skewed majorly towards input provisions, have not yielded desired outcomes. Therefore, the following production input support will be provided.

- **Expand Irrigation system**

Significant investments will be made to roll out climate resilient irrigation systems to realise 'more-per-drop'. ***Assured irrigation coverage will be expanded to 39 percent from the current 29 percent.***

To increase access to irrigation water, where the source is limited, ***alternative technologies such as water harvesting, and other extraction techniques will be explored.***

- **Support access to Seeds & Seedlings**

Modalities and mechanisms will be designed and implemented to ***ensure access to quality seeds and seedlings at adequate quantities to meet demand, and respond to climate change, economic, and socio-ecological conditions.*** Support for strengthening seed systems will cover capacity building, access to finance and technology, and enabling participation, establishment of farm shops/ sale outlet and growth of the private sector.

In keeping with regional frameworks, a minimum level of seed stock will be maintained as per the provisions of the SAARC Seed Bank. ***Research will be strengthened in areas related to plant breeding, genetic enhancement, and development of climate resilient crop and fodder varieties.***

- **Streamline access to Fertilisers & Pesticides**

Efficient and appropriate inputs for crop production will be facilitated to support and optimise production capacity. Modalities and mechanisms will be strengthened to ensure access and affordability to essential supplies of fertilisers and pesticides. ***Supply and delivery of agrochemicals will be streamlined, strengthened and facilitated,*** to avoid excessive use, without compromising on crop productivity. ***Efforts will also be made to produce domestic organic fertiliser to reduce the import of chemical fertiliser and support sustainable production systems.***

- **Strengthen access to Livestock Inputs**

Appropriate modalities and mechanisms will be strengthened to ensure accessibility, availability and timely supply of quality livestock inputs to enhance livestock production and productivity. While Government operated input production farms/centres will continue to maintain high quality germplasm as Great Grandparent (GGP) and Grandparent (GP); ***Private Sector and SOEs will be encouraged and their capacity strengthened to take up production of commercial inputs such as poultry DoCs, piglets, breedable heifers, fodder seeds and seedlings, and allied livestock inputs.*** Besides input production, the private sector will also be encouraged to take up AI and delivery of Animal Health Services where feasible.

Sex sorted semen technology is considered one of the most advanced reproductive bio-technology in dairy cattle to produce higher female progenies. ***Sex sorted semen facilities will be established and capacity built to manage and operate such facilities.*** While the technology is promising and there is high demand from farmers, at the moment sex sorted semen is imported.

- **Strengthen animal health and nutrition services**

Existing frameworks and mechanisms will be strengthened to control disease outbreaks; improve emerging and transboundary animal diseases surveillance; enhance biosecurity preparedness and response; and secure access to veterinary vaccines. Besides strengthening diagnostic and clinical services, ***efforts will be ramped to eliminate Dog-mediated Rabies, Peste des Petits Ruminants (PPR) and Bovine Brucellosis in Bhutan.***

Furthermore, to keep abreast of the new developments in animal health and nutrition, capacity development will remain cornerstone in strengthening the effectiveness of services provided by the central agencies and field offices.

The nutrition services for the livestock sector will include laboratory testing

services to ensure feed quality and safety to make the livestock product safe for consumption along the food chain. Similarly, to ensure that the animal nutrition component in the country is effective, ***support and facilitation will be provided to enable adequate fodder production, processing, and marketing (in the domestic market)*** thereby ensuring adequate feed and fodder resource mobilisation and utilisation.

- **Explore foreign seasonal farm labor**

The agrifood sector is seriously constrained by farm labor shortage which stands out as one of the biggest limiting factors for agrifood sector development. Farm labor shortage is worsened by continuing rural-urban migration, outmigration of youth, increasing feminization, and ageing members of households. There has been a significant reduction in the number of people employed in the agrifood sector over the last decade, from 65 percent in 2009 to 43.5 percent in 2023, accounting to an approximate reduction of the labor force by 1.4 percent annually[14].

In order to assure production and ensure success of commercialisation, ***opportunities to engage foreign farm labor will be explored for commercial farming and large-scale agrifood enterprises in collaboration with relevant agencies.*** If amenable, clear regulations will be articulated to expedite and facilitate this process.

- **Facilitate Land Lease**

Private entities and SOEs will be encouraged, allowed and facilitated, to lease State land, private prime fallow land and Dratshang/Gayrab land to grow priority and potential agriculture and livestock commodities on a large scale. ***The existing protocols and guidelines will be reviewed to enhance efficiency and allow for such large-scale lease in collaboration with the NLCS and other relevant agencies.***

- **Establish commercial input production facilities**

Bhutan imports over Nu 100 million worth of fertilisers and pesticides annually. Proposals to establish biofertilizer and biopesticide production facilities will be approved and fast-tracked and its utilisation, distribution and marketing to address the increasing import of synthetic agro-chemicals will be supported by providing subsidies and finance opportunities.

Interested private parties will be supported through investments and access to land to produce animal feed at key locations across the country. The private sector will also be encouraged to ***bring in FDI to leverage technology, know-how and finances.***

[14] Labor Force Survey, 2021 (www.nsb.gov.bt)

2.1.6 VALUE ADDITION, PROCESSING AND MARKETING

Value addition, processing, and marketing will be critical to reduce post-harvest losses, enhance market competitiveness, and diversify income sources for rural communities. Immense potential lies in transforming raw produce into high-value products aligned with Bhutan's unique identity for boosting exports. Strengthening logistical infrastructure across the value chain through targeted investments will be a key priority to enhance the efficiency of storage, transportation, and distribution of agricultural products.

2.1.6.1 ADVANCE POST-HARVEST STORAGE & PROCESSING CAPACITY

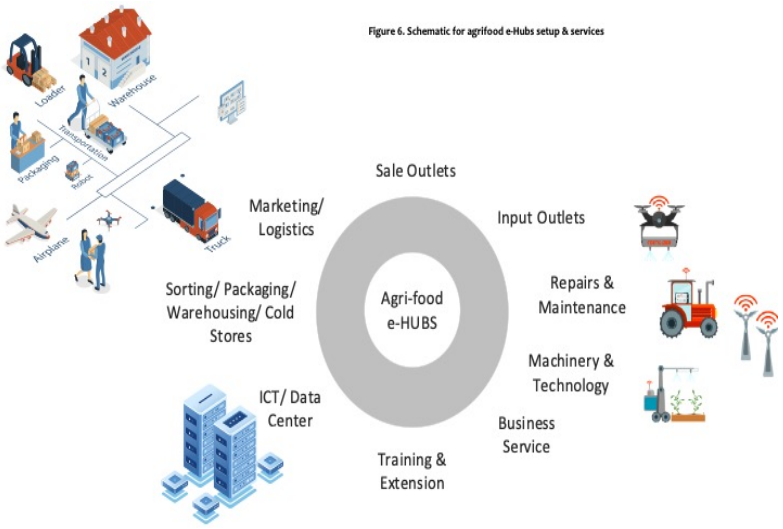
Post processing and storage facilities still remain necessary in Bhutan. Need-based building and proper management of cold-storage facilities will be expedited and ***mechanisms to manage all such facilities through PPP models will be considered.*** In addition to the research and development mandates, the post-harvest centres will strengthen provision of capacity building initiatives for the farmers and entrepreneurs.

Private sector entities will be supported to establish agri-tech start-ups to upscale and expand food processing establishments. BLDCL and private entities will be encouraged and supported to establish meat processing facilities. This will increase access to affordable and quality meat and reduce imports of unsafe meats.

2.1.6.2 DEVELOP & LEVERAGE Eco-HUBS

Agrifood Eco-Hubs (Figure 6) will be established at four key strategic locations to cover eastern, central, southern and western Bhutan. ***These Eco-Hubs will connect to domestic markets and international markets using upcoming air and railway ports.***

Figure 6. Schematic for agrifood e-Hubs setup & services

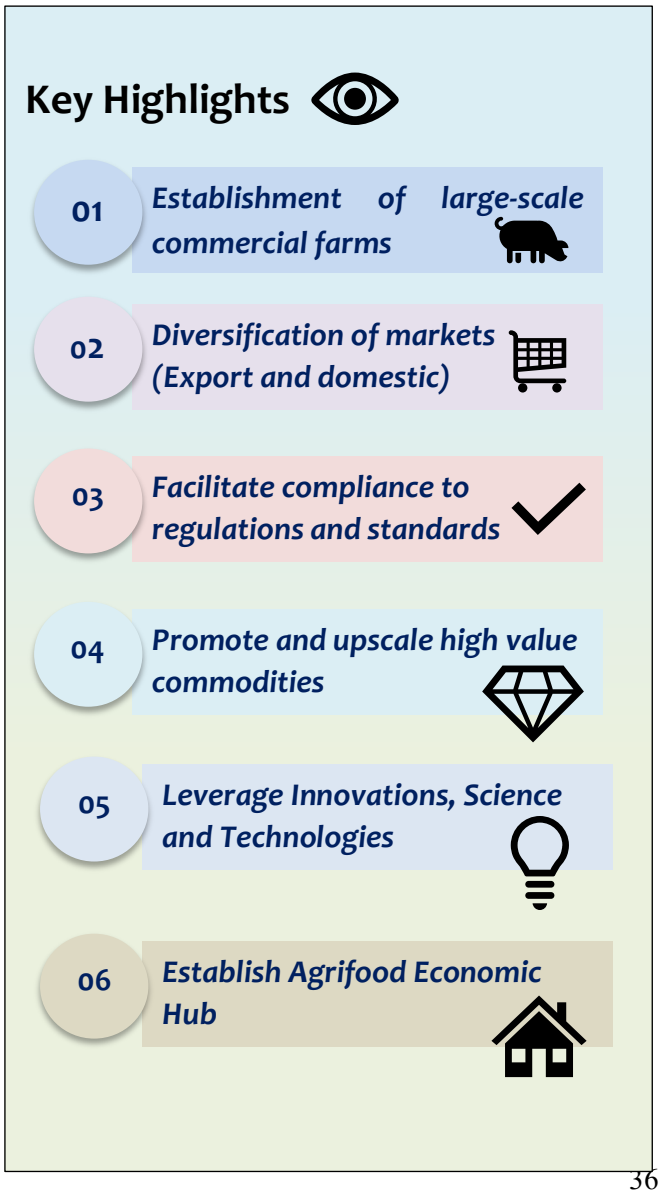


Eco-hubs will be established to provide a single space where both

Government (ARDC, RAMCO, RLDC, FMCL) and private service providers can convene. It will be the "go-to-place" in the region for everything related to the agri-food technology and services.

The Eco-Hubs will be set up in a 'Hub-and-Spokes' model. The Integrated Processing Center (Hub) will be linked to a network of Primary Agri-Food Centers(PACs) (Spokes). These PACs will aggregate, store and undertake basic processing activities at strategically located village or sub-Gewog clusters.

The PACs will be established and operated by professionally run farmer groups and cooperatives or private entrepreneurs or agri-food agencies like the agriculture and livestock extension offices. Private entrepreneurs and agri-businesses and farmer groups and cooperatives will be provided subsidy and special financial credits and incentive packages to establish PACs.



2.2 ENHANCE FOOD AND NUTRITION SECURITY

Enhancing food and nutrition security is essential for ensuring access to sufficient, safe, and nutritious food for all. This priority focuses on sustaining the production of cereals, and other priority crops to meet staple food needs while boosting the productivity of milk, meat, eggs, and honey to diversify diets and improve nutrition. ***Maintaining adequate against unforeseen shocks, ensuring food availability during crises.*** Moreover, strengthening smallholder farms through resource access, capacity building, and market linkages promotes inclusive growth and sustainable livelihoods, fostering a resilient and self-reliant food system.

2.2.1 SUSTAIN CURRENT LEVELS OF PRODUCTION FOR CEREALS & PRIORITY CROPS

Bhutan imports significant quantities of rice along with fruits, vegetables (tomatoes, onions and chillies), pulses and cooking oil. ***Supports to small holders will continue in order to maintain minimum self-sufficiency and to reduce import of essential food items.***

2.2.1.1 ENHANCE RICE PRODUCTION

Rice is the primary staple of all the Bhutanese and it has historically been an indispensable commodity to Bhutanese food system and livelihood. ***Current levels of production for rice will be sustained to cater to domestic demand.*** In 2023, Bhutan produced an estimated 40,804 MT of paddy from a harvested area of about 22,985 acres while importing close to about 89,000 MT annually.

Existing rice production areas will be protected and supported with the ***provision of high yielding varieties, access to farm machinery, irrigation system, fencing, land development, post-harvest technology,*** and domestic market facilitation including research program.

Close to 40,000 to 43,000 acres of prime wetland will be identified, protected and cultivation ensured through provision of appropriate incentives to sustain rice self-sufficiency levels at 35 percent level. ***Wetlands which fall outside of the protected prime wetland will be allowed to be used for cultivating other high value crops.***

2.2.1.2 ENHANCE WHEAT PRODUCTION

Bhutan produced about 837 MT of wheat in 2023. ***Current levels of production will be increased*** through short duration, high yielding varieties and enhancing access to machinery, post-harvest technology, and domestic market facilitation.

2.2.1.3 INCREASE MAIZE PRODUCTION

Bhutan produced 25,118 MT of maize in 2023. ***Current production levels will be increased*** by promoting high yielding varieties, heat tolerant varieties, improvement of post-processing technology including research and

development, and linking farmers with private companies for feed and value-added products. Market interventions will be critical in sustaining and enhancing production to meet the demand for food and feed purposes.

2.2.1.4 INCREASE PRODUCTION OF CHILLI, ONION & TOMATO

Chilies, tomatoes, and onions are essential vegetables in Bhutanese cuisine, highly demanded across the country. While annual chili production is relatively high, the cultivation of tomatoes and bulb onions remains low, with sufficiency levels below 10 percent. This is due to challenges such as the extended growing period required for onions and the vulnerability of tomatoes to blight disease. Furthermore, market factors, including the availability of cheap imports heavily impact local production.

Production will be planned according to agro-climatic conditions, with northern dzongkhags concentrating on summer cultivation and southern regions focusing on winter production. Chili cultivation will be prioritized during the lean winter months, utilizing both protected structures and open fields. Tomatoes, due to their susceptibility to diseases in open-field conditions, will primarily be grown under protected structures and rain shelters. Additionally, ARDCs will work to identify and promote short-duration onion varieties to replace the existing long duration variety.

Farmers will be connected with guaranteed markets, such as Gyalsung Academies and schools to enhance local vegetable production and will be encouraged to align their efforts with market demands.

ARDCs will actively focus on plant breeding to ***develop varieties that are climate-resilient, disease-resistant, high-yielding, and shorter growth durations.***

The production system will emphasize and expand the use of modern agricultural techniques, including ***water-efficient irrigation systems with semi-automation, protected structures, advanced mulching methods, and labor-efficient production inputs.***

Private entrepreneurs, youth farmer groups, progressive farmers and SOEs will be supported to engage in large-scale commercial production of chilies, onions, and tomatoes. This will be achieved through financing programs such as ***low-interest loans and crop insurance, along with access to technical expertise and state-of-the-art commercial farms.*** Production will be guided by business plans and contractually agreed target quantities. To ensure consistent output, minimum required production levels will be planned and maintained through measures like ***price support, subsidies, and buy-back mechanisms,*** encouraging farmers to sustain their efforts.

2.2.1.5 PROMOTE PRIORITY FRUITS AND NUTS

The priority fruits and nuts will be promoted through programs such as ***Million fruit tree plantation, focused village orchard, orchard revival, research outreach, nursery establishment and encouraging private and FDI ventures.***

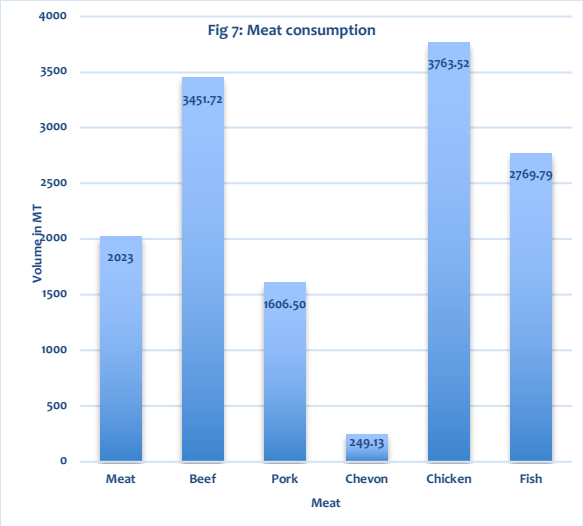
An orchard revival and climate adaptation program aimed at improving existing orchards and creating new ones will be initiated immediately. ***Farmers and landowners will be provided advisory services on varieties, orchard care, marketing and storage.***

2.2.1.6 INCREASE POTATO PRODUCTION

Potatoes continue to remain a crop of strategic importance for Bhutan. In 2023, Bhutan produced a total of 37,749 MT of potatoes.

On-going initiatives to maintain and improve potato yield and production will be sustained through collaborative initiatives to introduce new high-yielding and pest/disease resistant/chipping varieties including research and development. ***The potato seed system will be strengthened to support the growth of the potato industry through seed replacement*** including the development of potato seed, research and development on technologies.

Incentive schemes and subsidies for market-led production will be reworked on a priority basis and linkages with private parties keen to value-add on potatoes will be expedited. Where feasible, ***potato supply into the schools and institutions feeding program will be worked out.***



2.2.1.7 PROMOTE OILSEEDS

Bhutan is almost totally reliant on imports to meet cooking oil demand. Farmers will be encouraged to grow oilseeds and private entrepreneurs will be facilitated and encouraged through provision of tax breaks and soft loans, to establish cooking oil production enterprises.

2.2.2 ENHANCE PRODUCTIVITY OF MILK, MEAT, EGGS & HONEY

Opportunities within the livestock sector will be leveraged to enhance productivity of milk, meat, eggs and honey to secure food and nutrition and help boost farmer incomes.

In 2023, Bhutan consumed a total of 11,840.66 MT of meat (Figure 7)[15]. At 3,763.52 MT, Bhutanese consumed chicken the most, followed by beef (3,451.72 MT), fish (2,769.79 MT), pork (1,606.50 MT) and chevon (249.13 MT).

[15] Figures obtained from the DoL, MoAL

2.2.2.1 PRODUCE QUALITY, AFFORDABLE & SAFE BEEF

Given the high consumption and preference for beef, ***private parties will be encouraged to establish meat processing plants,*** where possible and appropriate, in partnership with reliable and interested external counterparts.

Given the Bhutan Livestock Development Corporation Limited's (BLDCL) track record and experience of supplying and processing meat, conducive environment will be created to embark on commercial meat production.

2.2.2.2 UPSCALE HYGIENIC PORK PRODUCTION

Pork is one of the most preferred meat item in Bhutan after chicken and beef. In 2022, Bhutan consumed a total of 2,456.4 MT of pork, of which 1,224.37 MT was imported. ***Pork production will be enhanced through production and supply of quality piglets, adoption and expansion of enhanced breeding technology,*** and the development of piggery enterprise through establishment of commercial farms. ***Support will be provided to strengthen value chains, improve processing and chilling facilities***, and enhance biosecurity measures.

Existing private contract pig breeders will be strengthened and ***incentives provided, where appropriate, to produce adequate piglets for pork production.***

2.2.2.3 ENHANCE CHICKEN PRODUCTION

Despite notable growth in Bhutan's poultry sector and production of up to 1,165 MT chicken in 2023, Bhutan still imported 2,583.2 MT of chicken. ***Chicken meat production will be upscaled through supply of quality inputs, establishment of commercial farms, improvement of health and nutrition, and strengthening poultry research.*** Value chains will be strengthened through establishment of processing and chilling plants, product development, and adoption of climate resilient farming technologies. To build scale, ***poultry federations will be instituted.***

Current support to farmers and private entrepreneurs will be upscaled and continued. In addition, ***private business will be encouraged and supported to establish bio-secure and efficient broiler farms/ high-tech state-of-the-art broilers farms.***

2.2.2.4 PROMOTE SUSTAINABLE & LOCALLY SOURCED HYGIENIC FISH

Bhutan imported more than 1700 MT of fish in 2023. Currently, more than 500 households do fish farming including Carp and Trout, and domestic production of fish stands at 43 MT in 2023.

Production of both Carp and Trout for table fish will be upscaled through supply of quality inputs, improvement of nutrition and management practices, and ***development of fishery enterprises through establishment of commercial/ community-based fisheries.*** Value chains will be strengthened by establishment of

processing and chilling facilities, product certification, and adoption of climate resilient farming technologies.

Private individuals will be encouraged to establish large scale commercial fisheries where feasible to raise production.

2.2.2.5 SUSTAIN CHEVON PRODUCTION

Bhutan consumed 249.13 MT of chevon in 2023, of which almost all were produced domestically. Current initiatives to support goat rearing and chevon production will be sustained and chevon production will be doubled by 2034. Accordingly, ***supply of suitable breeds, technical backstopping on rearing and management, and processing facilities will be provided.***

2.2.2.6 TREBLE EGG PRODUCTION

Bhutan has witnessed remarkable progress in the production of eggs over the last decade and remains self-sufficient in this sector. Ongoing efforts and interventions for strengthened input services, farm biosecurity and other support services will be sustained and upscaled. ***Additionally, "One egg per student per day" program will be instituted across all schools and institutions across Bhutan.*** This will require about 30+ million eggs a year and this would improve market absorption for eggs for a sustainable egg value chain.

2.2.2.7 LAUNCH BHUTAN'S WHITE REVOLUTION

Domestic milk production stood at 43,829 MT in 2023. Cheese and butter production has also witnessed a significant surge over the last decade. As a promising, socially accepted and relatively sustainable sector, dairy has the potential to transform the lives of Bhutanese across all Dzongkhags and increase farm incomes through sale of dairy products, excess cattle, and manure.

Dairy breed improvement programs through application of advanced reproductive biotechnology, particularly upscaling the usage of sex sorted semen and conventional semen, will be upscaled to produce upwards of 33,500 female progenies. This will be supported by improved nutrition and herd health management. Value chains will be strengthened through ***product diversification and improved storage, transportation and market networks.***

Better nutrition and management is expected to increase productivity from about 3 litres per day per cattle to about 4 litres per day. ***By 2034, upwards of 82,200 MT of milk will be produced annually.***

In parallel, concerted effort will be made to expand livestock cooperatives, and related processing and value addition units. ***The Kofuku[16] ventures under DHI will be replicated in the potential areas across Bhutan.*** Fresh milk and dairy based products will be particularly targeted at meeting demands at consumption centres, such as Thimphu, Wangdue (Bajo) and

[16] https://kil.bt/

Punakha (Khuru), Paro, Phuentsholing and Gelephu.

Dairy cooperatives will be expanded to cover all of Bhutan. Such cooperatives will be organised into a ***Bhutan Dairy Federation which can provide the scale and the framework to collect, store, process, value-add and trade diary related produce.***

2.2.2.8 EXPAND APICULTURE

Apiculture will be promoted and capacity strengthened to enhance honey production for both local bees (*Apis cerena*) and Exotic bees (*Apis mellifera*) which are managed by the farming communities across Bhutan. ***The focus will also be given on increasing the promotion of high-value honey such as blossom and putka to attract export markets.*** Interventions such as ***technology-based honey bee hives, secure mother apiary and other infrastructures will be put in place.***

2.2.2.9 STRENGTHEN YAK & RANGELAND MANAGEMENT

Yaks and Bhutan's alpine rangelands remain of strategic importance to Bhutan. Alpine rangelands will be improved and monitored to help herders and yaks. Existing yak federation frameworks will be strengthened and consolidated. Efforts will be continued to improve yak genetic resources, health, and nutrition. ***Value chains around yak produce such as cheese and fibre will be developed and expanded. Studies and research will be conducted to diversify highland livestock products including cross-breeding with premium cattle breeds.***

2.2.3 MAINTAIN ADEQUATE FOOD RESERVES

Adequate food reserves will be maintained as National Food Security Reserve at strategic locations. The Food Corporation of Bhutan Limited (FCBL) is primarily mandated to maintain reserves of essential food commodities at all times and to ensure a reliable supply to affected areas in the event of emergencies. Support will be provided to institute and implement mechanism(s) for the efficient management of NFSR.

2.2.3.4 MAINTAIN RESERVES OF ESSENTIAL FOOD COMMODITIES

The essential food commodities identified for reserve will be revisited and revised. Essential food commodities reserves should be able to feed 50 percent of the population aged 5 to 75 years for a duration of 1.5 months. An online national food reserve information system, which can help assess and manage the food reserve at any given point in time will be developed.

In addition, stock of raw materials, enough to meet the minimum nutrient requirement of poultry and piggery, ***for at least one month, will be maintained to ensure animal welfare and a stable livestock food reserve.***

2.2.3.2 DEVELOP INFRASTRUCTURE FOR MAINTENANCE OF FOOD RESERVES

Warehouses will be strategically located across the country. ***Depending on the requirement, new warehouses will be***

constructed, and existing warehouses will be renovated and/or expanded to store the mandated reserve. Infrastructure development for maintenance of food reserves will be done in a phase-wise manner.

2.2.3.4 ENSURE QUALITY OF FOOD RESERVES

Mechanisms will be instituted to ensure the quality and safety of food reserves. ***A robust inventory management system with regular monitoring will be implemented.*** Capacity building initiatives will be taken for the effective management of food reserves.

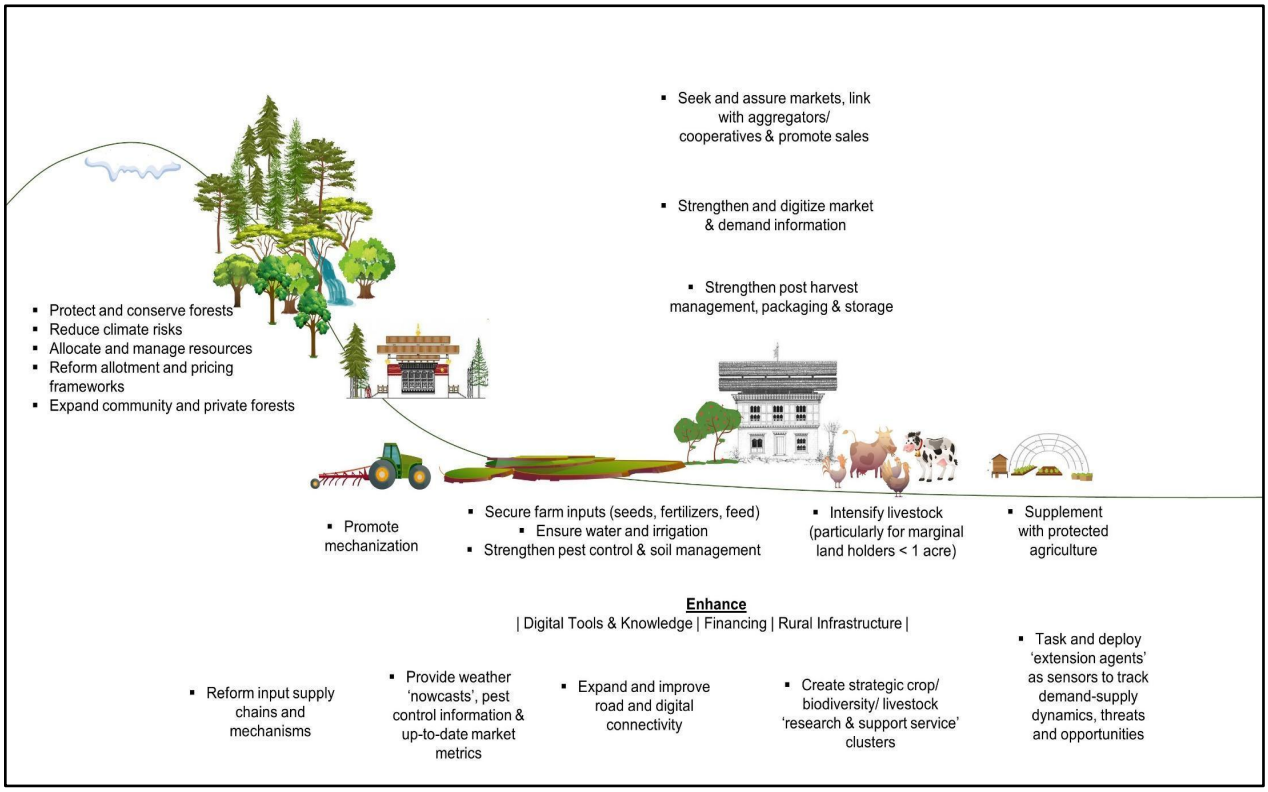


Figure 8. A framework for reviving smallholder farms and raising incomes across rural Bhutan

2.2.4 STRENGTHEN SMALLHOLDER FARMS

Smallholder farms will remain the mainstay for Bhutanese agriculture into the coming decade, and perhaps beyond, while initiatives to upscale commercial large-scale farms pick up pace. Almost all (98%) of Bhutan's farms are smallholders (<12 acres/ 5ha). Of this, 25 percent, one out of every four Bhutanese farmers, own less than one acre of land. Such farmsteads of less than an acre may be better classified as marginal holders, and ***farm support interventions for such farms will be tailored accordingly to contribute to household food self-sufficiency.***

Contribution from the smallholders to national food security is significant

therefore continued support for these categories of farmers will have a greater impact on the domestic food self-sufficiency than a small number of large farms.

2.2.4.1 STRENGTHEN HUMAN-WILDLIFE CONFLICT MANAGEMENT MEASURES

Almost one in every four farm households faced issues related to crop loss to wildlife[17], while one in every hundred faced losses of cattle to wildlife. An already challenged livelihood strategy is significantly compromised by persistent and on-going HWC.

Large scale programs to safeguard farming communities from wildlife depredation will be upscaled across the country. ***Chain-link fencing and other innovative interventions to complement electric fencing will be encouraged and subsidies provided to farmers.*** Further, stone wall fencing, live fencing for instance, the use of agave in sub-tropical areas will be encouraged for enhanced effectiveness and eco-friendly solution. ***Cattle breed improvement, stall feeding facilities, access to feed will also be ramped up to reduce free grazing and loss of cattle to predators.***

Research programs will be focused on evaluating the effectiveness of existing mitigation measures, such as electric and chain-link fencing, and ***exploring cost-effective alternatives like eco-friendly live fencing using species such as agave in subtropical areas.*** Studies on indigenous knowledge systems and practices will also be integrated to identify locally adapted strategies for managing HWC. ***Collaborative studies with conservation experts will be conducted to develop sustainable landscape management plans that balance ecological needs with agricultural productivity.***

2.2.4.2 EXPAND THE ONE-GREENHOUSE-PER-FARM INITIATIVE

Smallholder farms actively engaged in agriculture will be supported with greenhouses to expand coverage of climate protected production systems. ***In addition to the conventional greenhouses, innovative alternatives such as geodesic domes which are resistant to adverse weather conditions will be piloted for upscaling.*** All such contraptions may also be fitted with efficient irrigation systems, temperature control, and automated smart monitoring systems amongst others.

2.2.4.3 SUPPORT AGGREGATORS & COOPERATIVES

Aggregators will play an active role to help address Dzongkhag level food security (demand and supply) and help link producers with institutional kitchens (schools, hospitals, monastic bodies). Aggregation roles can be taken up by individuals, Farmers Groups, Cooperatives and SOEs. There are currently about 100 agrifood based cooperatives, 667 farmer groups and three SOEs in the agrifood sector. These entities play an important

[17] Estimated from 2019 RNR Census reports (https://www.nsb.gov.bt/rnr-census-reports/)

role in providing economies of scale - ensuring enhanced market access. Aggregators should be particularly encouraged for participation in Dzongkhags which continue to exhibit notable levels of poverty and issues of food insecurity and mismatch of production to market.

Aggregators will be supported to find seasonal markets at high-end outlets in Delhi, Kolkata, Dhaka, Bangkok, Singapore and Dubai. Capacity building on proper packaging and grading will be provided, standards developed, and exports facilitated via air freight.

2.2.4.4 DEVELOP LEAD FARMER'S NETWORKS

Farmers trained by the ARDC as lead farmers have demonstrated success in Eastern Bhutan. Building on this proven model, ***educated farmers and youth in villages will be trained to become Lead Farmers.*** Equipped with the necessary knowledge and skills in soil, plant, and animal health, these ***Lead Farmers will assist in providing essential extension and advisory services, complementing the efforts of the MoAL.*** They will also address human resource gaps and be trained to work with agrifood Big Data systems.

2.2.4.5 IMPROVE EXTENSION SERVICE

Extension services will be strengthened to deliver improved agriculture technologies; promote cooperative formation and its operationalization; monitor and collect data; build producer capacity; provide advisory services; and facilitate commercialization

Private extension service providers will be encouraged to provide professional services to large- scale commercial farms through soft loans and capacity building.

The Agriculture Extension Supervisors will be supported with digital tools which will be available from the agrifood big data platform to deliver services effectively.

2.2.4.6 INSTITUTE A "PRODUCED BY SMALLHOLDER FARMS" LABEL

Similar to the Bhutan *Organic* label, an additional label of ***'produced by smallholder farms/farmers of Bhutan', will be instituted based on the verification or authentication by the extension or local authority,*** much like artisanal products across the world. It is understood that smallholder farms have a lower carbon footprint and positively influence biodiversity persistence. As such, the 'produced by smallholder farms/farmers of Bhutan' label will positively supplement Bhutan's organic label.

A Gewog/Chiwog wise framework will be adopted to guide farmers in selecting the most beneficial and profitable cash crops for them to cultivate. The framework will be supported by branding initiatives such as implementing the certification schemes for ***Good Agricultural Practices (GAP), organic, Geographical Indication (GI), Made in Bhutan and Grown in Bhutan*** for enhanced market access and premium value.

2.2.4.10 IMPROVE FACILITIES IN RURAL AREAS

Farm labor attrition and increasing movement of youth to urban areas is often cited as a key challenge. ***Renewed attention will be paid to enhance liveability and vibrancy of rural areas,*** and comprehensive investments made to increase internet speed, access to quality health, water, sanitation and recreational facilities, while reducing local administrative drudgery.

2.2.4.11 SUPPORT SUPPLY OF TRADITIONAL SEEDS AND SEEDLINGS

Smallholder and commercial farmers will be supported with diverse popular traditional varieties and improved breeds from the gene bank as well as selected from on-farm to enhance crop and livestock productivity and resilience. Traditional seed varieties will be piloted for cultivation ensuring steady supply of high-quality seeds.

Key Highlights

01 *Enhance production of cereals, vegetables and fruits*

02 *Establish innovative mechanisms to mitigate HWC*

03 *Maintain food reserves and ensure food security*

04 *Enhance meat, fish, poultry and dairy production*

05 *Build resilience of smallholder farmers and strengthen services*

06 *Strengthen farmers groups, cooperatives and federations*

2.3 SECURE FINANCING & DE-RISK THE AGRIFOOD SECTOR

Significant interventions are being proposed for the agrifood sector, including strengthening support for smallholders through enhanced input provision and promoting commercialization. However, the availability of adequate financing is crucial to initiating these efforts effectively. Moreover, persistent challenges such as climate change, crop losses due to human-wildlife conflict, and the prevalence of pests and diseases pose substantial barriers to the sector's advancement. Consequently, ***the establishment of robust de-risking mechanisms is imperative to mitigate risks and ensure the resilience and sustainability of the agrifood sector.***

2.3.1 SECURE AGRIFOOD SECTOR FINANCING

Access to finance is one of the biggest impediments, both to the sustenance of smallholders, as well as initiatives to upscale commercialization. Current mechanisms and channels to access finance for the agrifood sector must be strengthened. For robust growth of agrifood sector, ***a sustainable agricultural financing mechanism will be instituted.***

2.3.1.1 DEVELOP INNOVATIVE AND SUSTAINABLE FINANCING MECHANISM

In order to catalyze a paradigm shift in Bhutan's agrifood sector, an effort to establish a ***sustainable funding mechanism that leverages innovative financing tools and partnerships to ensure long-term support for the agrifood sector in Bhutan will be implemented.*** This fund will provide the necessary financial support to implement strategic interventions aimed at ***enhancing resilience, inclusivity, and sustainability in the sector.*** Where possible, government's financial support system in the agrifood sector will be integrated for desired outputs and outcomes. ***Different financing packages will also be developed to encourage farmers to take risks for agricultural investments and businesses.*** Expeditious efforts will be put in establishing a ***long-term fund source for sustainable agricultural development in the country.***

2.3.1.2 STRENGTHEN FINANCIAL INSTITUTIONS

The Bhutan Development Bank Limited (BDBL) is the main financial institution responsible for rural development in Bhutan and accounted for more than 90 percent of total agricultural loans in 2020/21[18]. The government will continue to ensure that BDBL's primary and core concern will be to support the agrifood sector.

Endowment and fiscal support will be extended to financial institutions to ensure low interest loans for the agrifood sector. To ensure that loans allocated to the agrifood sector are utilized for its intended purposes, monitoring and evaluation of loan implementation will be rigorously strengthened.

[18] (BRECSA)

2.3.1.3 DEVELOP FINANCIAL PRODUCTS

Financing will be expanded to support enterprises along the entire food systems value chain and cover: ***input supply enterprises; farm machinery/equipment supply and rental services; crop and livestock insurance, professional services catering to agricultural sector, aggregation, storage and transport services including refrigerated vehicles; agrifood processing and packaging facilities; storage, distribution and retailing.***

MoAL and financial institutions will collaborate to develop ***new and customized financial products for all value chain components.*** Digital Financial Services (DFS) will be deployed to enhance access to finance and track repayment. Additionally, ***bioprospecting-based product development will be supported to promote green economy and livelihood.***

2.3.1.4 REFORM INCENTIVE SCHEME PROGRAMS & SUBSIDIES

Buy back and minimum price schemes will be re-designed to suit the needs of both producers and consumers. Various incentive scheme program and subsidies will be designed to meet the needs of different enterprises. Systems will be developed and deployed to enable farmers to ***redeem all such subsidies through a digital farm credit card system.***

2.3.1.5 LEVERAGE CLIMATE & INNOVATIVE FINANCE

International climate finance options will be explored and the private sector will be supported to access such finances. Opportunities will be scaled to link farms to obtain payments for ***environmental services, carbon credits, and other agroecology preservation credits.***

2.3.2 CLIMATE PROOF & DE-RISK AGRIFOOD SECTOR

The agrifood sector of Bhutan remains highly vulnerable to the impacts of climate change such as flash floods, incessant rainfalls, increasing temperature, evolution of new pests and diseases, changing wildlife habitat causing HWC, Glacier Lake Outburst Floods (GLOFs), landslides and others. ***Bhutan also has significant population living in the mountainous regions whose livelihoods are highly dependent on agricultural farming such as highland livestock and high-value wild commodities.*** These highland communities remain easily susceptible to the impacts of climate change. Therefore, building resilience of agrifood sector in Bhutan derives ***urgent interventions to adapt to changing climatic conditions, global weather patterns and unforeseen climate risks.***

2.3.2.1 URGENTLY ADDRESS CLIMATE CHANGE RELATED THREATS

The impacts of climate change are projected to worsen into the coming century. Increasing risks from erratic weather, rise in global temperature, and emergence of new pests and diseases, are projected to adversely impact crop and livestock production.

Nationally Determined Contributions and National Adaptation Plan for agricultural sector will be enhanced with proper alignment to national climate objectives and global goals. Implementation of Low

Emission Development Strategy for Food Security will also be expedited. Special emphasis will also be accorded to ***building resilience of the highland communities through research, development, innovations, technologies and partnerships.***

Climate smart agriculture and resilient practices for both crops and livestock will be scaled up. Research and development on climate resilient varieties for crops and livestock, emerging pests and diseases, along with water efficient technologies will be financed.

Digital monitoring of emerging threats will be mainstreamed as part of the agrifood Big Data framework and the MoAL will contribute in an annual climate risk assessment report.

2.3.2.2 ESTABLISH RISK SHARING MECHANISM FOR CROP AND LIVESTOCK LOSS

The RGoB will subsidize and provide initial capital to establish innovative insurance schemes with relevant partners to insure crops and livestock including highland. Such schemes will encourage farmers and assure livelihoods at times of disasters and calamities. ***Digital Financial Services will be deployed to ensure easy access and use of all such services.***

2.3.2.3 TRANSITION TO CLEAN ENERGY & MINIMISE AGRIFOOD SECTOR WASTE

In keeping with Bhutan's aspirations to remain carbon neutral, value chain building within the agrifood sector will transition away from fossil fuels. ***Infrastructure related to storage and post-processing enterprises will be encouraged to adopt renewable energy and electrification of agrifood related transportation.*** Efforts will be made to upscale waste-to-energy initiatives, such as biogas, at both farm and commercial enterprise level in partnership with interested private and civil society actors.

Interventions to reduce agrifood sector's contribution to Green House Gas (GHG) emission will be upscaled and GHG inventory reporting mechanism will be strengthened in collaboration with relevant agencies.

Appropriate mechanisms will be instituted to ***prevent food loss and wastage across the food systems value chain.***

2.3.2.4 BUILD & SUSTAIN CLIMATE RESILIENT INFRASTRUCTURE

The irrigation master plan will be reviewed, and locations prioritized for seeking funds to ensure the reach of irrigation to potential food production sites. Furthermore, ***on-going initiatives to expand efficient water utilization, water reservoirs and innovative farming technologies will be promoted and scaled up.*** Similarly, climate smart housing for livestock farming besides appropriate breeds of livestock and fodder varieties, will be explored and implemented to meet the international commitment made to remain carbon neutral while ensuring food and nutrition security. ***Energy efficient and environmentally friendly agricultural***

infrastructures will be promoted and established.

2.3.2.5 CONSERVE & PROMOTE SUSTAINABLE UTILISATION OF BIODIVERSITY

In the pursuit of growth and yield improvement, Bhutan has lost many important native and indigenous varieties and breeds, of both crops and livestock. Considering the importance of native breeds and genetic diversity to ensure resilience of agricultural production systems, ***efforts to conserve native breeds and maintain genetic diversity will be continued.*** These genetic reservoirs will assume increasing importance as we move into the future. ***The emphasis will be provided on scaling up Bioprospecting and, Access and Benefit Sharing (ABS) projects and programs for economic benefits of the country.*** Native and productive crop and livestock genetics will be conserved for future propagation and food security as well as for short term research and development.

Precision farming, efficient irrigation, and soil conservation will be enhanced for sustainable use of critical resources like water and soil nutrients. Biodiversity-friendly practices which support ecosystem services such as pollination, pest regulations, and soil fertility essential for both agricultural sustainability and ecological balance will be promoted.

2.3.2.6 UPSCALE CLIMATE ADVISORY SERVICES

The weather forecast from the National Centre for Hydrology and Meteorology (NCHM) will be co-produced by the Agrometeorology Program of the Department of Agriculture. ***Weather based crop advisories will be disseminated to the farmers using both formal and informal mechanisms.*** The Agromet Advisory Bulletin (AAS) will be issued throughout the cropping period for strategic crops such as rice, vegetable and fruits. The existing tools such as Agromet Decision Support System (ADSS), Mobile Application (SanamJabchor) will be upscaled to provide agromet and early warning services for the end users.

2.3.2.7 STRENGTHEN PESTS & DISEASE RELATED SERVICES

With a rapidly warming climate coupled with increasing and recurrent outbreaks of pests and diseases, institutional capacity and ***mechanisms to prevent the emergence and spread of pests and diseases to protect crops, livestock, and forests will be strengthened.*** Enhanced emphasis will be made on effective preparedness for prevention, containment and eradication of pests and diseases, ***for greater economic return on investments in the agrifood sector.***

Biosecurity systems will be strengthened across the country; diagnostic capacity and reach of existing institutions and laboratories within and beyond the MoAL, such as the NPPC under the DoA, NCAH under the DoL and BFDA under the MoH will be strengthened to provide advisory and remedial services.

A coordinated surveillance system will be established for early detection, and timely responses to pest and disease incidents and to facilitate comprehensive pests and diseases risk mapping. Concurrently, there will be a focus on bolstering biosecurity infrastructure at entry points, along with strengthening of border biosecurity surveillance measures.

Key Highlights

01 *Institute Digital Financial Services*

02 *Access Global Climate Financing*

03 *Secure long-term financial resources*

04 *Roll out national crop and livestock insurance scheme*

05 *Build energy-efficient and eco-friendly agri-infrastructures*

06 *Strengthen agromet services*

07 *Strive to reduce GHG emission from agricultural sector*

Chapter 3: MEANS OF IMPLEMENTATION

3.1 INVESTMENT PLANNING | 2024 – 2025

All project elements and strategic priorities stipulated in this strategy will be incorporated into sectoral and agency plans with clear targets, deliverables, and implementation frameworks. Funding will be sought on a priority basis to ensure implementation of key and priority programs and projects. Immediate efforts will be made to leverage climate financing and international soft loans for key projects.

The implementation of this strategy will span ten years, concluding with the 14th Five Year Plan (FYP). Strategic activities will align with the ministry's five-year plans, where they will be prioritized and executed through annual work plans. With a strong alignment to Bhutan's vision of becoming a developed nation by 2034, the strategy aims to double the sectoral achievement of the 13th FYP in the 14th FYP. This will be accomplished through market-led production, focusing on key infrastructure development, adherence to farming standards, and compliance to meet diverse consumer demands.

Accordingly, the required resources for implementing the strategy are projected to double in the 14th FYP compared to the overall plan outlay of Nu. 15 billion in the 13th FYP. The strategy will be operationalized through well-defined projects and programs, leveraging investments from private sectors and foreign direct investment.

3.2 EXECUTION PRINCIPLES | 2026 – 2034

The strategy will be translated into projects and actionable programs which reaffirms commitment to meeting its broad goals. All projects will be ready for implementation starting 2026.

Project and program implementation will align itself to addressing key challenges, and the agrifood sector should focus attention and energy on meeting strategic priorities. Protection of smallholders will be guaranteed while transitioning to, and scaling up, commercial and next gen farms. Science and big data will be immediately leveraged to build efficiencies and remove redundancies.

Key infrastructure will be expanded and financing made widely accessible to truly enable private sector growth and participation. Policy shifts will be accelerated to enable ease of private sector participation.

The RGoB will foster and leverage partnerships to build synergies along the entire agri-sector value chain. A farmer and private entrepreneur first approach will be

adopted, and information and services ramped up, to empower farmers and youth, thereby trebling farm incomes by 2034.

Farming will be increasingly viewed as a business enterprise and farmer advisory services will be tailored to maximize RoIs.

Using the established agrifood Big Data platform, the sector will be nimble, adaptive and flexible. By harnessing the power of real time analytics, the sector will be able to proactively track progress, contain and address issues, and ensure the rapid transformation of the sector to create significant value for Bhutan.

3.3 MEANS OF IMPLEMENTATION, GOVERNANCE & STAKEHOLDER ENGAGEMENT

While the MoAL will be the key custodian of the Strategy and ensure its implementation, success will not be assured without the support of farmers, private sector, local government, and allied Government agencies. During implementation, clear responsibilities will be delineated across national and local levels, and amongst Government agencies, private parties, academia and CSOs. See Figure 9.

Emphasis will be accorded to building delivery partnerships, greater engagement of the private sector, and stakeholders across the board.

The Ministry – Departments and the Secretariat at MoAL – will be primarily responsible for policy adjustments, leveraging Government and international financing, securing international markets, monitoring of programs, evaluating impact, and facilitating technology adoption and research.

The capacity of Local Governments, regional agencies and CSOs will be enhanced to effectively address human-wildlife conflict, control and manage pest/disease outbreaks, deliver inputs, and provide advisory services. To support the shift in focus and evolving skill requirements, strengthening the human resource capacity of the MoAL will be essential for successful implementation. Accordingly, an HR master plan will be developed and executed to address these needs effectively.

Private sector and smallholder farmers will be capacitated to enhance production and build value along the food-systems value chain, while academia and CSOs will increasingly participate in and contribute to agrifood systems research and capacity building.

At a broader level, Figure 9 provides a 'means of implementation' framework which identifies agencies and actors to deliver against key strategies and domains.

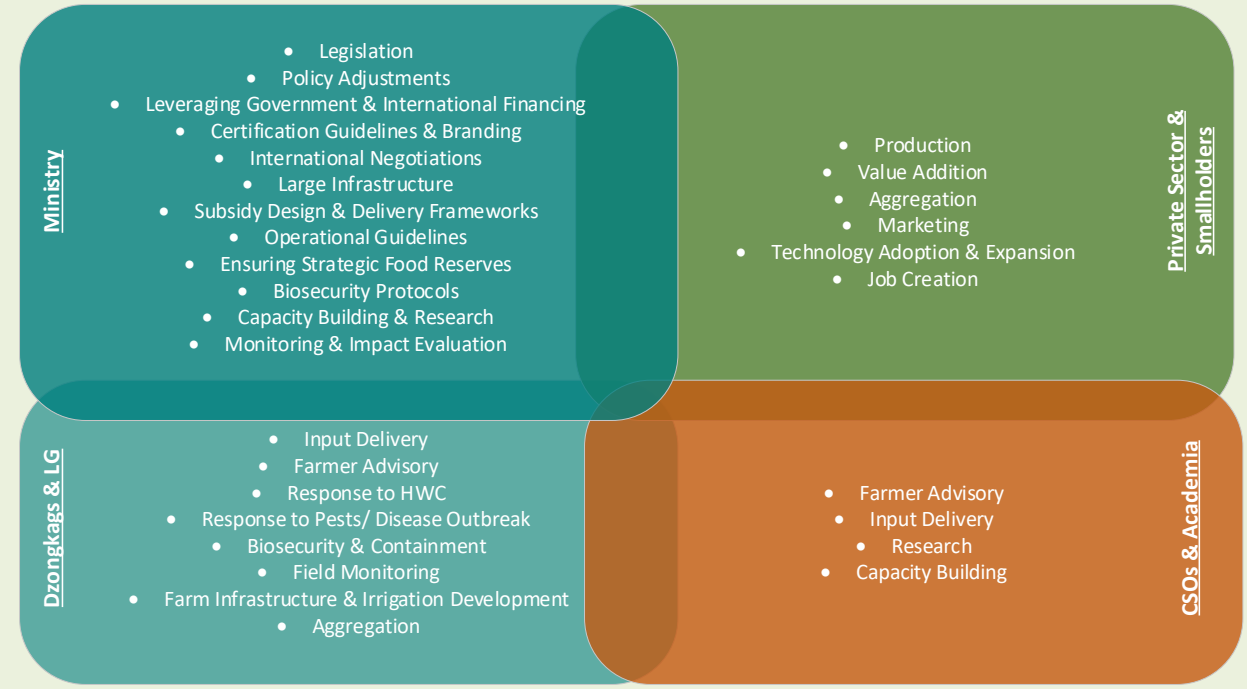


Figure 9. Major responsibilities assigned across stakeholders and governance levels

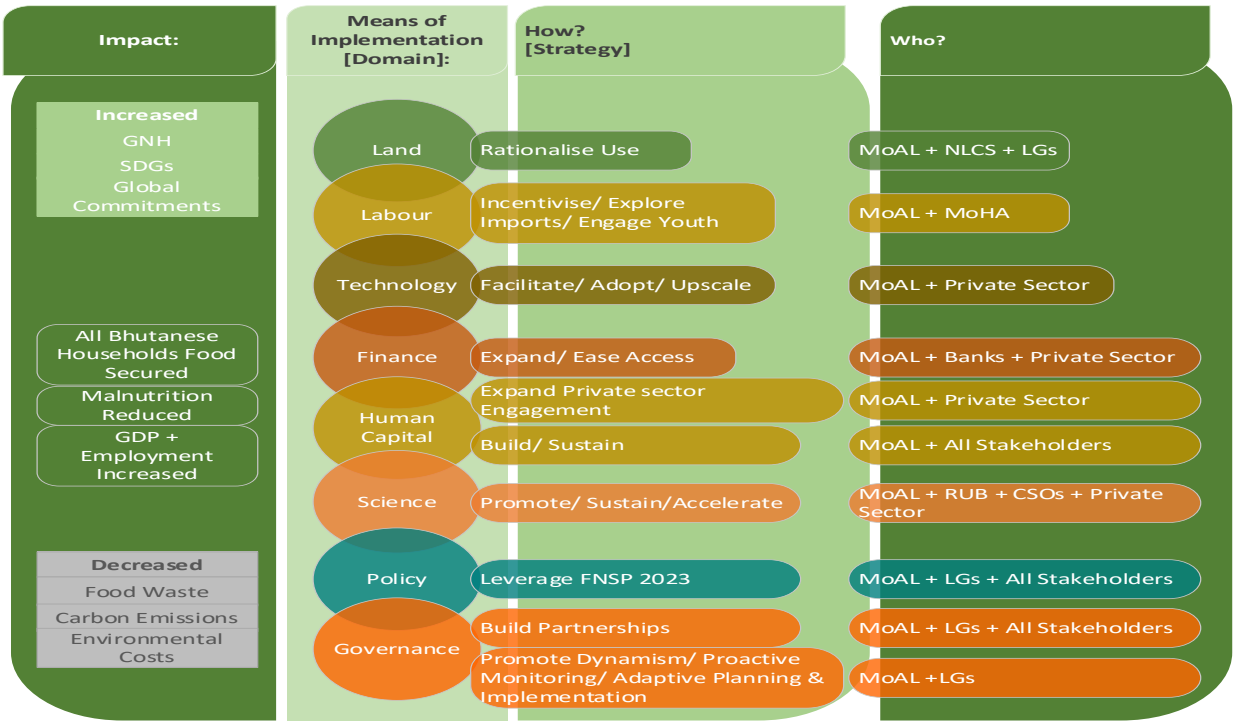


Figure 10. Means of Implementation Framework

Implementation Arrangement

Strategy	Strategic Interventions and actions	Lead agency	Collaborating Agencies
ACCELERATE TRANSITION TO COMMERCIALIZATION	Explore export markets	MoAL (DAMC), MoICE (DoT)	MFAET
	Implement national institutional feeding programme	MoAL (DAMC, DOA, DOL)	MoESD (DSE), LGs (Dzongkhags and Gewogs)
	Meet growing demands from urbanization	MoAL (DAMC, DOA, DOL)	LGs (Thromde)
	Build regulations and standards aligned with international best practices	MoAL (DAMC, DOA, DOL), MoH (BFDA), MoICE (BSB)	
	Facilitate compliance to regulations and standards	MoAL (DAMC, DOA, DOL), MoH (BFDA), MoICE (BSB)	
	Understand the requirement of specific export markets	MoAL (DAMC), MoH (BFDA)	MFAET
	Support advancement of quality infrastructure	MOIT (DoID), MoICE (BSB)	MoAL (DOA, DOL, DAMC)
	Build brand bhutan, standards, certification	MoAL (DAMC, DOL, DOA), MoH (BFDA)	LGs (Dzongkhags and Gewogs), MoICE (DoT, DoMCIIP)
	Strengthen biosecurity	MoH (BFDA)	MOAL (DOA, DOL, DAMC)
	Address trade barriers expeditiously	MoAL (DAMC)	MoICE (DoT), MFAET (DETD)
	Upscale high value commodities	MoAL (DoA, DoL)	LGs (Dzongkhags and Gewogs)
	Promote, prioritise and grow high-value crops	MoAL (DoA)	LGs (Dzongkhags and Gewogs)
	Expand commodity-based landscape level organic farming	MoAL (DoA)	LGs (Dzongkhags and Gewogs)

	Promote, prioritise and produce high-end specialty livestock products	MoAL (DoL)	LGs (Dzongkhags and Gewogs)
	Support existing export commodities	MoAL (DoA, DoL)	MoAL (DAMC), MoICE (DoT), MFAET (DETD)
	Establish commercial farms	MoAL (DoA, DoL)	LGs (Dzongkhags and Gewogs), SoEs
	Accelerate private sector engagement	MoAL	LGs (Dzongkhags and Gewogs), SoEs, BCCI
	Actively engage & support youth led business enterprises	MoAL	LGs (Dzongkhags and Gewogs), SoEs, BCCI
	Upscale farm mechanization	MoAL	LGs (Dzongkhags and Gewogs)
	Launch agri-solutions, big data and digital platforms	MoAL	Govt Tech
	Pilot & upscale next gen agriculture and farming	MoAL	Govt Tech
	Expand irrigation	MoAL (DoA)	MoIT (DoID
	Support access to seeds & seedlings	MoAL (DoA)	LGs (Dzongkhags and Gewogs)
	Streamline access to fertilisers & pesticides	MoAL (DoA)	
	Strengthen access to livestock inputs	MoAL (DoL)	
	Strengthen animal health and nutrition services	MoAL (DoL)	
	Explore import of seasonal farm labor	MoAL	MoICE, MoHA

	Facilitate land lease	MoAL (DoA)	NLCS, LGs (Dzongkhags and Gewogs)
	Establish commercial input production facilities	MoAL (DoA, DoL)	LGs (Dzongkhags and Gewogs), SOEs
	Advance post-harvest storage & processing capacity	MoAL (DAMC)	SOEs, BCCI
	Develop & leverage eco-hubs	MoAL (DAMC)	SOEs, BCCI
ENSURE FOOD AND NUTRITION SECURITY	Enhance rice production	MOAL (DOA)	LGs (Dzongkhags and Gewogs), SOEs
	Sustain wheat production	MOAL (DOA)	LGs (Dzongkhags and Gewogs)
	Increase maize production	MOAL (DOA)	LGs (Dzongkhags and Gewogs), SoEs
	Increase production of chilli, onion & tomato	MOAL (DOA)	LGs (Dzongkhags and Gewogs), SoEs, BCCI
	Promote priority fruits and nuts	MOAL (DOA)	LGs (Dzongkhags and Gewogs)
	Increase potato production	MOAL (DOA)	LGs (Dzongkhags and Gewogs)
	Promote oilseeds	MOAL (DOA)	LGs (Dzongkhags and Gewogs)
	Produce quality, affordable & safe beef	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI

	Upscale hygienic pork production	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI
	Enhance chicken production	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI
	Promote sustainable & locally sourced hygienic fish	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI
	Sustain chevon production	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs)
	Treble egg production	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI
	Launch bhutan's white revolution	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs), SOEs, BCCI
	Expand apiculture	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs)
	Strengthen yak & rangeland management	MOAL (DOL) BLDC	LGs (Dzongkhags and Gewogs)
	Maintain reserves of essential food commodities	MOAL, FCBL	LGs (Dzongkhags and Gewogs)
	Develop infrastructure for maintenance fo food reserves	FCBL	MOAL, MoF
	Ensure quality of food reserves	FCBL	MoH (BLDC)
	Strengthen human-wildlife conflict management measures	MOAL (DOL, DOA)	MoF, Financial Institutions

	Expand the one-greenhouse-per-farm initiative	MoAL (DoA)	LGs (Dzongkhags and Gewogs)
	Support aggregators & cooperatives	MoAL (DAMC)	LGs (Dzongkhags and Gewogs)
	Develop lead farmer's networks	MoAL (DOA, DAMC, DOL)	LGs (Dzongkhags and Gewogs)
	Improve extension service	MoAL (DoA, DoL)	LGs (Dzongkhags and Gewogs)
	Institute a "produced by smallholder farms" label	MoAL (DAMC)	MoAL (DoL, DoA), MoICE (DoT, DOMCIIP)
	Improve facilities in rural areas	RGOB	All agencies
	Support supply of traditional seeds and seedlings	MoAL (NBC)	MoAL (DoA), LGs (Dzongkhags and Gewogs)
SECURE FINANCING & DE-RISK THE AGRIFOOD SECTOR	Develop innovative and sustainable financing mechanism	MoAL	RGOB
	Strengthen bdbl & financial institutions	MoAL	MoF, RGoB, BDBL
	Develop financial products	MoAL	MoF, RGoB, BDBL
	Reform incentive scheme programs & subsidies	MoAL	MOF, RGOB
	Leverage climate & innovative finance	MoAL	MOF, RGOB
	Urgently address climate change related threats	MoAL	MoENR
	Establish risk sharing mechanism for crop and livestock loss	MoAL	MoF, Financial Institutions, MoENR

	Transition to zero-carbon energy & minimise agrifood sector waste	MoAL	MoENR, MoICE
	Build & sustain climate resilient infrastructure	MoAL	MoIT, MoENR
	Conserve & promote sustainable utilisation of biodiversity	MoAL (NBC)	LGs (Dzongkhags and Gewogs), MoENR
	Upscale climate advisory services	MoAL, NCHM	
	Strengthen pests & disease related services	MoAL (DoA, DoL)	LGs (Dzongkhags and Gewogs)

3.4 TRACKING IMPACT

The agrifood sector acknowledges the rapid pace with which the world is radically advancing and evolving. Following a five-year implementation of game-changing strategic priorities, the sector will build on on-going analyses, synthesise lessons learnt, and urgently chart the next trajectory. Where needed, radical course corrections will be made. Inefficiencies will be weeded out, and resetting of delivery mechanisms and institutional arrangements, will be swiftly carried out. There will be immediate and expanded scaling up of successful initiatives. And a renewed, far-reaching, and wide-ranging post 2034 agrifood sector strategy will be developed, to continue delivering significant impacts from the agrifood sector for Bhutan and her people.

Impact will be measured along the following broad metrics:

- Return on investments and agrifood sector contribution to GDP, income and exports
- Levels of domestic self sufficiency
- Technology adoption, innovation, efficiencies and institutional capacity
- Private sector participation, business advancement and employment creation.

Implementation Plan											
Strategy	**Strategic Interventions and actions**	**Timeline**									
		Y1	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
ACCELERATE TRANSITION TO COMMERCIALIZATION	Explore export markets										
	Implement national institutional feeding programme										
	Meet growing demands from urbanization										
	Build regulations and standards aligned with international best practices										
	Facilitate compliance to regulations and standards										
	Understand the requirement of specific export markets										
	Support advancement of quality infrastructure										
	Strengthen biosecurity										
	Address trade barriers expeditiously										
	Promote, prioritise and grow high-value crops										
	Expand commodity-based landscape level organic farming										
	Promote, prioritise and produce high-end specialty livestock products										
	Support existing export commodities										
	Establish commercial farms										
	Accelerate private sector engagement										
	Actively engage & support youth led business enterprises										
	Upscale farm mechanization										

	Launch agri-solutions, big data and digital platforms										
	Pilot & upscale next gen agriculture and farming										
	Expand irrigation										
	Support access to seeds & seedlings										
	Streamline access to fertilisers & pesticides										
	Strengthen access to livestock inputs										
	Strengthen animal health and nutrition services										
	Explore import of seasonal farm labor										
	Facilitate land lease										
	Establish commercial input production facilities										
	Advance post-harvest storage & processing capacity										
	Develop & leverage eco-hubs										
ENHANCE FOOD AND NUTRITION SECURITY	Enhance rice production										
	Sustain wheat production										
	Increase maize production										
	Increase production of chilli, onion & tomato										
	Promote priority fruits and nuts										
	Increase potato production										
	Promote oilseeds										
	Produce quality, affordable & safe beef										
	Upscale hygienic pork production										
	Enhance chicken production										

	Promote sustainable & locally sourced hygienic fish											
	Sustain chevon production											
	Treble egg production											
	Launch Bhutan's white revolution											
	Expand apiculture											
	Strengthen yak & rangeland management											
	Maintain reserves of essential food commodities											
	Develop infrastructure for maintenance for food reserves											
	Ensure quality of food reserves											
	Strengthen human-wildlife conflict management measures											
	Expand the one-greenhouse-per-farm initiative											
	Support aggregators & cooperatives											
	Develop lead farmer's networks											
	Improve extension service											
	Institute a "produced by smallholder farms" label											
	Improve facilities in rural areas											
	Support supply of traditional seeds and seedlings											
SECURE FINANCING & DE-RISK THE AGRIFOOD SECTOR	Develop innovative and sustainable financing mechanism											
	Strengthen bdbl & financial institutions											
	Develop financial products											

	Reform incentive scheme programs & subsidies										
	Leverage climate & innovative finance										
	Urgently address climate change related threats										
	Establish risk sharing mechanism for crop and livestock loss										
	Transition to zero-carbon energy & minimise agrifood sector waste										
	Build & sustain climate resilient infrastructure										
	Conserve & promote sustainable utilisation of biodiversity										
	Upscale climate advisory services										
	Strengthen pests & disease related services										

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