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**PERFORMANCE AUDIT REPORT ON
FOOD SELF-SUFFICIENCY & SECURITY**

February 2019



PERFORMANCE AUDIT REPORT ON FOOD SELF-SUFFICIENCY AND SECURITY

FEBRUARY 2019

DISCLAIMER NOTE

The review is confined to food self-sufficiency and security focusing on the aspects of food availability and accessibility in the country. The review was carried out as per the objectives and program prepared by the Royal Audit Authority. The findings are based on the information and documents made available by the audited agencies.

This is also to certify that the auditors during the audit had neither yielded to pressure, nor dispensed any favor or resorted to any unethical means that would be considered as violation of the Royal Audit Authority's Oath of Good Conduct, Ethics and Secrecy.



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ROYAL AUDIT AUTHORITY
Bhutan Integrity House

Reporting on Economy, Efficiency & Effectiveness in the use of Public Resources



RAA/TAD (PA-MoAF)/2018-19/ 325

11th February 2019

Hon'ble Secretary
Ministry of Agriculture and Forests
Thimphu

Hon'ble Secretary
National Land Commission Secretariat
Thimphu

Hon'ble Secretary
Gross National Happiness Commission
Thimphu

Subject: Performance Audit Report on Food Self-sufficiency and Security

Sir,

Enclosed herewith please find the Performance Audit Report on 'Food Self Sufficiency and Security' covering the period 2012-13 to 2016-17. The Royal Audit Authority (RAA) conducted the audit under the mandate bestowed by the Constitution of Kingdom of Bhutan and the Audit Act of Bhutan 2018. The audit was conducted as per the International Standards of Supreme Audit Institutions on performance auditing (ISSAI 3000). The overall objective of the audit was to ascertain the efficiency and effectiveness of Ministry of Agriculture and Forests (MoAF) in enhancing food self-sufficiency and security by making various kinds of food available through improved production, and access to food. Specifically, the audit aimed

1. To ascertain the existence and/or adequacy of legal and institutional framework, and policies of the Ministry in enhancing food self-sufficiency and security; and
2. To review and assess the efficiency and effectiveness of the Ministry's interventions for enhancement of availability and accessibility of food.

The report has been prepared based on our reviews of the available documents, analysis of data, and discussion with relevant officials of the Ministry. The report contains positive initiatives, shortcomings and deficiencies as well as recommendations.

"Every individual must strive to be principled. And individuals in positions of responsibility must even strive harder."

-His Majesty the King Jigme Khesar Namgyel Wangchuck

P.O. Box: 191, Kawajangsa, Thimphu: Bhutan. Tel: 322111 / 322833, Fax: 323491

Website: www.bhutanaudit.gov.bt email: sinfo@bhutanaudit.gov.bt

The draft report was issued on 24th December 2018 to MoAF, NLCS and GNHC for factual confirmation, comments and feedbacks. Responses received have been incorporated as well as appended in the report as Appendix. The report also contains a set of recommendations, which are intended to address the shortcomings and deficiencies thereby enhancing efficiency and effectiveness of the Ministry in enhancing food security.

In line with the directives of the Parliament, the RAA has instituted a system to fix the accountability on the officials responsible to implement recommendations provided in the Performance Audit Reports. Therefore, we would request the Ministry and other agencies responsible for implementation of each recommendation to submit duly completed and **signed Accountability Statement** (attached) to the RAA. In the event of non-submission of the Accountability Statement, the RAA shall fix the responsibility for implementation of the recommendations on the Head of the Agency as per Section 55(17) of the Audit Act of Bhutan 2018. The RAA will follow up implementation of the recommendations based on the Accountability Statement and failure to comply will result in taking appropriate actions, which may include suspending audit clearances to the accountable official(s).

The RAA would therefore appreciate receiving a Management Action Plan Report for implementation of audit recommendations with definite timeframe on or before 13th May 2019 along with the signed Accountability Statement.

We take this opportunity to acknowledge the officials of Ministry of Agriculture and Forestry, for rendering necessary co-operation and support extended during the audit.

Yours sincerely,


(Tshering Kezang)
Auditor General of Bhutan

Copy to:

1. Hon'ble Lyonchhen, Royal Government of Bhutan, Thimphu;
2. Hon'ble Gyalpoi Zimpon, Office of Gyalpoi Zimpon, Thimphu;
3. Hon'ble Speaker, National Assembly of Bhutan, Thimphu;
4. Hon'ble Chairperson, National Council of Bhutan, Thimphu;
5. Hon'ble Opposition Leader, National Assembly of Bhutan, Thimphu;

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6. Hon'ble Chairperson, Public Accounts Committee, National Assembly of Bhutan, Thimphu (enclosed five copies);
7. Director General, Department of Agriculture Marketing and Cooperatives, MoAF, Thimphu;
8. Director, Department of Agriculture, MoAF, Thimphu;
9. Office copy; and
10. Guard file.

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MANAGEMENT ACTION PLAN REPORT

Recon No.	Audit Recommendation in brief	Action Taken or To be Taken	Estimated Implementation Date	Estimated Completion Date	Responsibility Entrusted to:	
					Name & Designation	EID no.
4.1	Ministry should establish proper institutional linkages for an integrated approach to achieve food security.					
4.2	Ministry in collaboration with NLCS should formulate a comprehensive agriculture land classification and zones					
4.3	GNHC should develop a resource allocation formula					
4.4	NLCS should finalise the draft National Land policy					
4.5	Ministry should ensure sustainable use and management of agriculture land					
4.6	The MoAF should ensure maintenance of National Food Security Reserve with FCBL					
4.7	Ministry should finalize the subsidy policy					
4.8	Ministry in collaboration with the financial institutions should come up with affordable access to credit and crop insurance schemes					
4.9	Ministry should intervene and strengthen strategies to address Human wildlife conflict					

4.10	Ministry should develop and maintain food information management system					
4.11	Ministry should maintain comprehensive market information					
4.12	Ministry should establish a robust system and strengthen its monitoring roles					
4.13	Ministry should strengthen existing market infrastructures					
4.14	Ministry should conduct training need analysis and impact assessment					

ACCOUNTABILITY STATEMENT

PERFORMANCE AUDIT ON FOOD SELF-SUFFICIENCY AND SECURITY

Recon No.	Audit Recommendation in brief	Personal Accountability			Supervisory Accountability		
		Name & Designation	EID no.	Sign	Name & Designation	EID no.	Sign
4.1	Ministry should establish proper institutional linkages for an integrated approach to achieve food security						
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(s/d)
Secretary

TITLE SHEET

1. Title of the Report	:	Performance audit report on Food Self-Sufficiency and Security
2. AIN	:	15651
3. Audited Entities	:	Ministry of Agriculture and Forests
4. Schedule of Audit	:	24 th May 2018 – 3 rd August 2018
5. Audit Period	:	2012-13 to 2016-17
6. Audit Team	:	1. Tenzin Chhoedup, Deputy Chief Auditor (EID: 200601048)
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7. Supervisor	:	Sonam Wangmo, Assistant Auditor General (EID: 200401104)
8. Overall Supervisor	:	Chimi Dorji, Deputy Auditor General (EID: 9610060)

ACRONYMS AND ABBREVIATIONS

AIN	Audit Identification Number
ALDG	Agriculture Land Development Guidelines
BCCI	Bhutan Chamber of Commerce and Industries
BTS	Bhutan Trade Statistics
CFM	Centenary Farmers' Market
CMIS	Community Managed Irrigation Systems
CSI	Cottage and Small Industries
DAMC	Department of Agriculture Marketing and Cooperatives
DoA	Department of Agriculture
DoFPS	Department of Forest and Park Services
FCBL	Food Corporation of Bhutan limited
FMCL	Farm Machinery Corporation Limited
FNS	Food and Nutrition Security
FYP	Five-Year Plan
GDP	Gross Domestic Product
GECC	Gewog Environment Conservation Committee
GNHC	Gross National Happiness Commission
GRF	Government Reserve Forest
IMS	Information Management System
ISSAI	International Standards for Supreme Audit Institution
LFS	Labour Force Survey
MoAF	Ministry of Agriculture and Forests
MoH	Ministry of Health
NLCS	National Land Commission Secretariat
NPPC	National Plant Protection Centre
PAG	Performance Audit Guidelines
PSL	Priority Sector Landing
RAA	Royal Audit Authority
RBI	Reserve Bank of India
RDTC	Rural Development Training Centre
RGoB	Royal Government of Bhutan
RMA	Royal Monetary Authority
RNR	Renewable Natural Resource
SAP	School Agriculture Program
SKRA	Sector Key Result Area
SSR	Self-sufficiency rate

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
CHAPTER 1 - ABOUT THE AUDIT	4
CHAPTER 2 - INTRODUCTION	6
CHAPTER 3: FINDINGS	11
Part I: Initiatives and positive development.....	11
Part II: Shortcomings and Deficiencies	13
3.1 Inadequacies in institutional arrangement for an integrated approach to enhance food security	13
3.2 Lack of comprehensive land classification and agriculture zones	13
3.3 Declining share of budget allocation to Agriculture Sector	14
3.4 Agriculture land not fully utilized	16
3.5 Increasing trend in food dependency undermining self-sufficiency in longer run	18
3.6 Conversion of land to non-agricultural purposes.....	19
3.7 Non-achievement of 11 th FYP food production target.....	22
3.8 Lack of Subsidy Policy	24
3.9 Inadequate crop compensation schemes	25
3.10 Inadequate crop insurance schemes.....	26
3.11 Limited credit facilities for agriculture sector	27
3.12 Non-maintenance of National Food Security Reserve	29
3.13 Lack of need assessment and impact assessment for farmers' trainings.....	30
3.14 Absence of pricing policy/guidelines.....	31
3.15 Inadequate monitoring and evaluation of Cooperatives and Farmer's Groups	32
3.16 Farm Shops not meeting its intended objectives.....	34
3.17 Inadequate Agriculture Infrastructure	35
a) Irrigation system.....	35
b) Storage facility	37
3.18 Inadequacies in the Information Management Systems	38
a) Absence of an integrated Information Management System	39
b) Market information system for food prices not updated.....	39

CHAPTER 4: RECOMMENDATIONS	42
4.1 Ministry should establish proper institutional linkages for an integrated approach to achieve food security	42
4.2 Ministry in collaboration with NLCS should formulate a comprehensive agriculture land classification and zones.....	42
4.3 GNHC should develop a resource allocation formula	42
4.4 NLCS should finalise the draft National Land policy.....	43
4.5 Ministry should ensure sustainable use and management of agriculture land	43
4.6 The MoAF should ensure maintenance of National Food Security Reserve with FCBL.....	43
4.7 Ministry should finalize the subsidy policy.....	44
4.8 Ministry in collaboration with the financial institutions should come up with affordable access to credit and crop insurance schemes	44
4.9 Ministry should intervene and strengthen strategies to address Human wildlife conflict.....	44
4.10 Ministry should develop and maintain food information management system.	45
4.11 Ministry should maintain comprehensive market information	45
4.12 Ministry should establish a robust system and strengthen its monitoring roles	45
4.13 Ministry should strengthen existing market infrastructures	46
4.14 Ministry should conduct training need analysis and impact assessment.....	46
CHAPTER 5: CONCLUSION	47
APPENDICES	49
ANNEXURE	52

EXECUTIVE SUMMARY

Agriculture is one of the five important jewels for economic development in the country. Food and Nutrition Security (FNS) Policy of the Kingdom of Bhutan, 2014 provides the overall vision, goals and objectives for poverty reduction and addressing food insecurity. As such, guaranteeing food security as basic human rights has been the principle policy objective of the Royal Government of Bhutan (RGoB). Bhutan, despite having adequate legislative tools, policies and earnest efforts to increase food security, the sector's growth had remained insufficient in enhancing food self-sufficiency and security. Although agriculture sector has the highest share of employment with 57.2%, its contribution to Gross Domestic Product (GDP) is 16%.

Bhutan's food basket comprises of 151 items (436 varieties) wherein domestic goods and services comprises of 48.01% and 51.99%¹ of imported items. Bhutan is especially vulnerable in terms of food self-sufficiency due to high dependency on cheap imports from neighbouring countries. In 2017, 8.2%² of the population was estimated to be under poverty line and food volume 147,342.90 MT worth Nu. 7,172.10 million was imported. On the other hand, Bhutan does not have a strong export sector excluding hydropower.

The Ministry of Agriculture and Forests (MoAF) is the national agency entrusted with the mandate for agriculture production, management, use and development of arable land in making rural livelihood productive and sustainable through its operations to contribute towards the pursuit of Gross National Happiness (GNH).

The Royal Audit Authority (RAA) had conducted the "Performance Audit on Food Self-sufficiency and Security as mandated by the Constitution of the Kingdom of Bhutan and Audit Act of Bhutan 2018. The audit was conducted following Performance Audit Guidelines (PAG), which is in line with the International Standards of Supreme Audit Institutions (ISSAIs). The overall objective of the audit was to ascertain the efficiency and effectiveness of Ministry of Agriculture and Forests (MoAF) in enhancing food self-sufficiency and security by making various kinds of food available through improved production, and access to food. Specifically, the audit aimed:

- a) To ascertain the existence and/or adequacy of legal and institutional framework, and policies of the Ministry in enhancing food self-sufficiency and security; and
- b) To review and assess the efficiency and effectiveness of the Ministry's interventions for enhancement of availability and accessibility of food.

The audit was conducted in Department of Agriculture (DoA), MoAF covering the period 2012-13 to 2016-17. The team also visited other relevant government agencies responsible for ensuring food self-sufficiency and security. Discussion with relevant government officials and interviews with farmers were conducted to gather information on food production and accessibility.

¹ RMA Annual report 2016/17

² Poverty Analysis Report, 2017

The RAA observed both positive developments and inadequacies. Some of the notable initiatives and positive developments include

- Development and implementation of the National Food and Nutrition Security (FNS) Policy, 2014;
- Achieving self-sufficiency in fruits and eggs;
- Development of Renewable Natural Resources (RNR) Marketing Policy, 2018 and Agriculture Land Development guidelines (ALDG);
- Publication of annual agricultural statistics;
- Creation of Renewable Natural Resources (RNR) Statistics Division;
- Implementation of School Agriculture Program; and
- Development of the Endowment fund for Crop and Livestock Conservation, 2017.

Notwithstanding the positive accomplishments, the RAA also observed deficiencies and shortcomings of which, significant findings are briefly highlighted below:

- a) Institutional arrangement and linkages amongst relevant stakeholders for a coordinated and integrated approach in implementation of the FNS policy and other issues related to food self-sufficiency and security was found inadequate;
- b) Land classification and agriculture zones for effective regulations and monitoring of land use and management was inadequate;
- c) There is a lack of remedial policy intervention and strategic coordinated approach from NLCS and MoAF to address the increasing trend of fallow land which if continued may result in non-achievement of the national food self-sufficiency target;
- d) Increasing food production and reducing imports is a challenge, which if continued would undermine food self-sufficiency and security in longer run;
- e) Loss of agriculture land to other developmental activities, and urbanisation through conversion of agriculture land which, if continued may have serious consequences in long run to meet food requirements of the population at all times;
- f) A policy/guideline on agriculture subsidy to incentivize and encourage farm production in order to enhance food self-sufficiency and security was not formulated;
- g) With declining trend in budget, reassuring self-sufficiency and security remains a challenge;
- h) Crop compensation and insurance schemes to address crops damages and losses to wildlife and natural calamities is inadequate in facilitating development of agriculture;
- i) The National Food Security Reserve and SAARC Food Security Reserve was not maintained;

- j) Access to credit at household level at discounted and affordable rate for development of agriculture is limited;
- k) An adequate mechanism in regulating/stabilising food prices through a systematic and organised market for agriculture produce by MoAF is lacking;
- l) Monitoring and evaluation on the management of the Farmer's Cooperatives and Farmer's groups is ineffective resulting in non-compliances;
- m) The existing agriculture infrastructure such as irrigation and storage facilities is inadequate in facilitating food production and accessibility to its maximum potential; and
- n) There is lack of updated and complete market information on prices of varied food commodities, demand and supply, current market situation and forecasts, food auction dates which are key information for creating enabling market environment.

Based on the audit findings, the RAA has provided 14 recommendations aimed at enhancing efficiency and effectiveness in enhancing food self-sufficiency and security. The audit recommendations are:

1. Establishing proper institutional linkages for an integrated approach to enhance food self-sufficiency and security;
2. Formulating a comprehensive agriculture land classification and zones;
3. Developing a resource allocation method;
4. Finalising the draft National Land policy;
5. Ensuring sustainable land use and management of agricultural land;
6. Maintenance of National Food Security Reserve and SAARC Food Security Reserve;
7. Finalising the subsidy policy;
8. Supporting farmers through access to credit and crop insurance schemes in pursuit of agriculture development and growth;
9. Intervening through various strategies to address human wildlife conflict;
10. Developing an information management system;
11. Maintaining comprehensive market information and instituting proper mechanism to regulate/stabilise food prices in the market;
12. Establishing a robust monitoring and supervision system for Farmer Cooperatives and groups;
13. Strengthening existing market infrastructures; and
14. Conducting training need analysis and impact assessment.

CHAPTER 1 - ABOUT THE AUDIT

1.1 Mandate

The Royal Audit Authority has conducted the “*Performance audit on Food Self-Sufficiency and Security*” focused on the aspects of food availability and accessibility as mandated by the Constitution of the Kingdom of Bhutan and Audit Act of Bhutan 2018 as follows:

- a) Article 25 (1) of the Constitution of the Kingdom of Bhutan provide that “There shall be a Royal Audit Authority to audit and report on the economy, efficiency, and effectiveness in the use of public resources”; and
- b) Section 68 of the Audit Act of Bhutan 2018, under the ‘Functions and Jurisdiction of the Authority’ states, “The Authority shall audit and report on the economy, efficiency and effectiveness in the use of public resources”.

1.2 Audit Standards

The RAA conducted the audit in accordance with the RAA’s Performance Audit Guidelines, which is consistent with the International Standards of Supreme Audit Institutions on Performance Auditing (ISSAI 3000).

1.3 Audit Objectives

The overall audit objective was to ascertain the efficiency and effectiveness of Ministry of Agriculture and Forests in enhancing food self-sufficiency and security through improved production, and access of food. Specifically, the audit aimed:

- a) To ascertain the existence and/or adequacy of legal and institutional framework, and policies of the Ministry in enhancing food self-sufficiency and security; and
- b) To review and assess the efficiency and effectiveness of the Ministry’s interventions for enhancement of availability and accessibility of food.

1.4 Audit Scope

The Performance audit of food self-sufficiency and security was focused on the intervention of the MoAF in enhancing production and accessibility to food crops mainly cereals and vegetables for the period covering 2012-13 to 2016-17. The audit did not cover the aspects of food utilization and food stability. The review focused on production and accessibility of food crops mainly on cereals and vegetables.

1.5 Audit Approach

The RAA used system-oriented and problem based audit approaches. Using these approaches, the audit focused mainly on the systems and matters affecting food self-

sufficiency and security in the country. These approaches were applied considering the issues and challenges in attaining food self-sufficiency and security through review of various literatures and publications.

1.6 Audit Methodology

Following audit methodologies were carried out during the audit to gather data and information, analyse data and derive conclusions.

- a) Reviewed legislation, rules and regulations, government policies, business and operational objectives, publication and reports on food self-sufficiency and security;
- b) Visited MoAF to collect and confirm the actual agriculture land (including fallow land) in the country based on types, areas, production and yield. The team also obtained information on loss of agriculture land to other developmental activities through conversion. Information on agriculture programs along with activities, targets, budget were also collected to assess the performance of the Ministry in achieving its food targets.
- c) Discussions held with multiple Departments in the Ministry to understanding their mandates and responsibilities. The team also understood on how the information are stored and report generated;
- d) Visited NLCS to obtain and cross-verify agriculture land conversion with that of MoAF's records for the year 2012-17;
- e) Compared and cross checked data reliability from different publication such as Bhutan Trade Statistics, National Statistical Bureau, RNR/Agriculture Statistics on food imports and exports;
- f) Visited Dzongkhag Administration in Thimphu, National Seed Centre (NSC), and Farm Machinery Corporation Limited (FMCL) in Paro to understand the types of subsidies and procedures in providing subsidies;
- g) Field visit made to sampled Gewogs to interview officials and farmers to gather information on food production and accessibility;
- h) Visited Regional office, Food Corporation of Bhutan Limited (FCBL) in Thimphu to collect information on the operation and management of food shops;
- i) Visited Centenary Farmers market in Thimphu to understand the market situation for local produce. The team also interviewed few consumers on market information;
- j) Physical verification to understand/check on the usage and benefits of cold storage in Dagapela and farm shops in Thimphu; and
- k) Conducted system walkthroughs, interviews, and document reviews.

CHAPTER 2 - INTRODUCTION

2.1 Background

Bhutan is predominantly an agriculture-based society contributing 16% to Gross Domestic Product (GDP)³. As per Labour Force Survey (LFS) 2016, agriculture and forestry employs 198,429 persons out of the economically active population of 347,130. Although the percentage share of employed persons in agriculture is declining over the years, agriculture sector still has the highest share with 57.2%. This indicates the importance of agriculture sector to the sustenance of livelihood of majority of the Bhutanese population.

The Ministry of Agriculture and Forests (MoAF) is responsible for making rural livelihood productive and sustainable through its operations to better contribute to the pursuit of Gross National Happiness (GNH). During the first to seventh Five Year Plan (FYP), the Ministry's focus was on food self-sufficiency however, from eight FYP onwards, the policy shifted to food security. Food security in Bhutan was equated with enhancing food availability through attainment of appropriate level of food self-sufficiency neglecting the importance of food accessibility and utilization. Now with the FNS policy, the stated goal is to 'enhance food and nutrition security' by making various kinds of foods available through improved production, access and enabling effective utilisation of food.

Agricultural practices have changed tremendously over the years. In the past, agriculture was practiced on a subsistence basis, supplemented by raising different kinds of domestic animals such as cattle, chicken, pigs and yaks. Today, increasing number of farms are mechanised with sizable investment on the machinery and other inputs that are subsidized by the government. However, the Ministry is still faced with recurring challenges in enhancing food self-sufficiency and security.

2.2 Policy and Institutional Framework

Food and Nutrition Security Policy of the Kingdom of Bhutan, 2014 provides the overall vision, goals and objectives for poverty reduction and addressing food insecurity in the country. FNS policy is multi-dimensional comprising of enabling availability of food, access to food and proper utilization of food. The legislation and regulations in relation to food self-sufficiency and security is provided in **Annexure I**.

The MoAF is the national agency entrusted with the mandate for agriculture production systems, including production of food crops, management, use and development of arable land resources in the country. The Ministry is responsible to lead and coordinate the overall implementation of food security policy and strategic action plans. Department of Agriculture (DoA) under MoAF is responsible to plan and implement programs aimed to ensure food security and increase income through improved management of arable,

³ National Accounts Statistics, 2017,

horticulture crops and medicinal plants. Access to markets, farm inputs, construction of farm roads and selection of improved technologies are some of the means prioritized. Department of Agricultural Marketing and Cooperatives (DAMC) is mandated to promote marketing of RNR products through promoting efficient and effective marketing systems, facilitating institutional linkages and strengthening farmers groups and cooperatives. The organisation structure of the MoAF is provided in **Annexure II**.

2.3 Current Food Situation

Bhutan's present market basket comprises of 151 items (436 varieties) wherein domestic goods and services comprises of 48.01% and 51.99%⁴ of imported items, implying that 48.01% of the consumer price index inflation is controlled by the domestic policies and 51.99% influenced by Government of India's policies and inflation targets.

Bhutan has easy access to food products from India due to strong bilateral relationship between the two countries. Bhutan's 85% of trade is with India. In 2017, poverty declined to 8.2% from the estimate of 12% in 2012 however, poverty in rural areas is significantly higher with 11.9%. Bhutan's food export had decreased from 62,345 MT (Nu. 1,752.90 mill) in 2012 to 53,232 MT (2,808.80 mill) in 2017. As regards to food import, it increased from 134,739 MT (Nu. 4,339.90 mill) in 2012 to 154,537.50 MT (Nu. 7,172.10 mill) in 2017. Amongst the food commodities imported, rice constitutes the major proportion of imports, with an increasing trend from 68,235 MT in 2012 to 87,671.23 MT in 2016, indicating that domestic supply has not been able to keep pace with the increasing demand for rice over time.

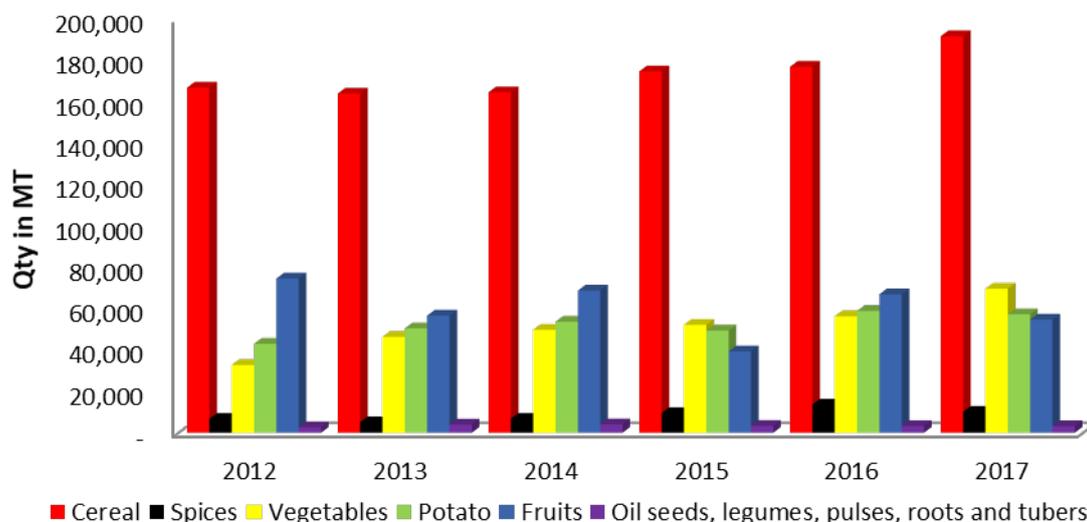
Bhutan's production and import statistics exhibit that it is virtually not possible for Bhutan to restrict imports of essential food items from other countries. Further, Bhutan does not have a strong export sector excluding hydropower. Bhutan's overall trade balances have remained negative. The imports of primary agriculture commodities have contributed to the negative balance of payment to some extent. In 2016, Bhutan's overall trade imbalance was Nu. 32,000.00 million with total imports of Nu. 67,400.00 million and total exports of Nu. 35,260.00 million.

2.3.1 Food Production

Agriculture in Bhutan is largely subsistence oriented, with low input low output-farming systems. The major food crops produced in the country include cereals, spices, vegetables, fruits, oil seeds, legumes, pulses, roots and tubers as illustrated in **Figure 1**. Paddy (rice) is the most important and preferred staple crop in Bhutan and as such, production of paddy is synonymous to food security, which is one of the important national goals.

⁴ RMA Annual report 2016/17

Figure 1: Production of major food crops 2012-17

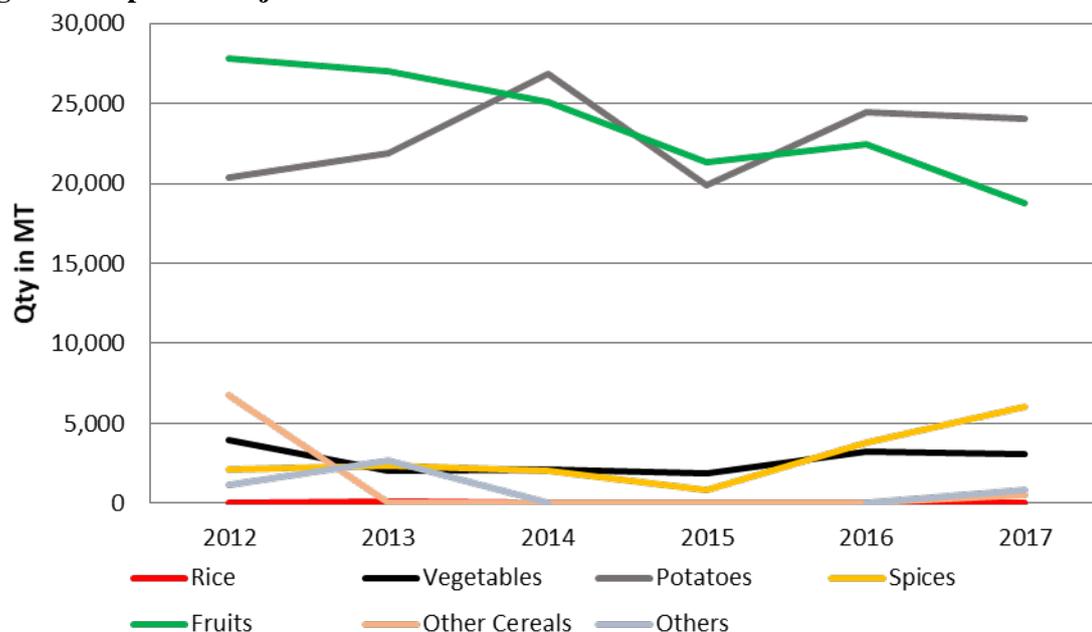


Cereal production has been leading among ten widely grown food crops in the country with gradual increase from 160,000 MT in 2012 to 180,000 MT in 2017. The year wise production of food commodities from 2012-17 is presented in **Annexure III**. Fruits, vegetables and potatoes are the second major food commodities grown in the country. While Bhutan also grows spices, oil seeds, legumes, pulses, roots and tubers, the volume of production are not significant as the prior produces.

2.3.2 Food Export

Food exports of major food commodities during 2012-17 is illustrated in **Figure 2**.

Figure 2: Export of major food commodities 2012-2017



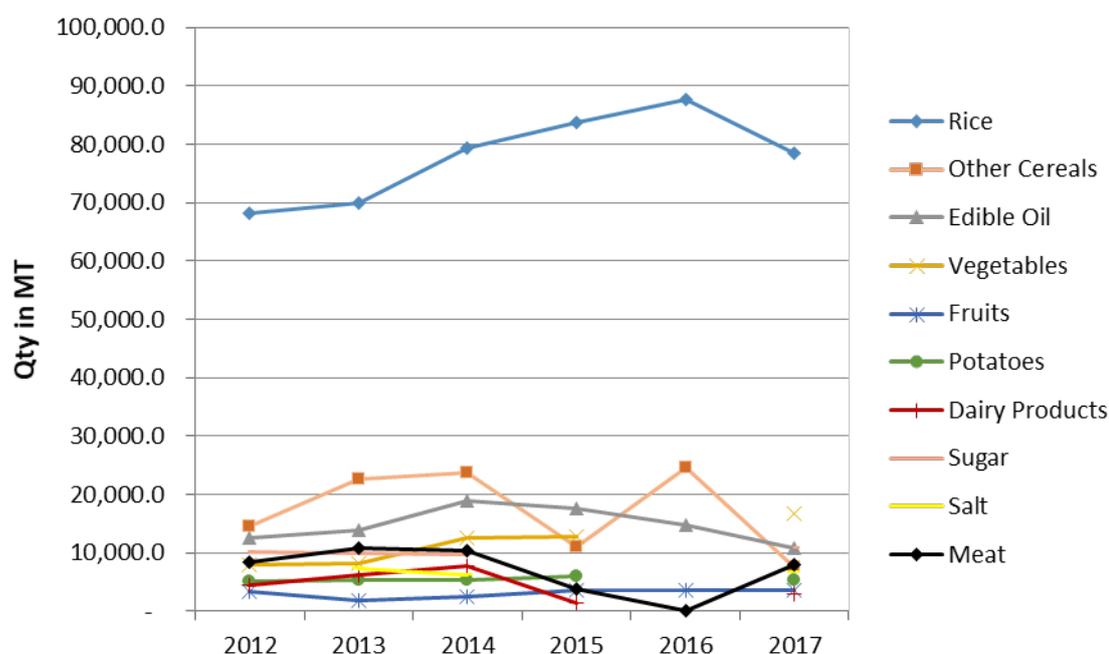
Bhutan exports varieties of food commodities and some of the major food items exported are potatoes, fruits, vegetables, spices and cereals. Other exported commodities include

cordyceps, coffee, tea, betel nuts, edible oil, mushroom, dairy products, meat/live animals, honey and incense. Food commodities aggregating to 339,315.90 MT were exported during 2012-17. Fruits was the highest commodity exported with 142,404.17 MT constituting 41.96 % of the total exports while export of rice was 245 MT constituting only 0.0007 % of the total exports.

2.3.3 Food Import

Bhutan imports wide range of food commodities such as rice, other cereals, edible oil, vegetables, fruits, potatoes, dairy products, sugar, salt & meat. During 2012-17, 893,436.70 MT⁵ of food commodities was imported. Rice remained the highest imported commodity constituting about 50% (467,192.93 MT) of the total imports while Cardamom accounted for the lowest import with 4.4 MT.

Figure 3: Import of food commodities 2012-2017



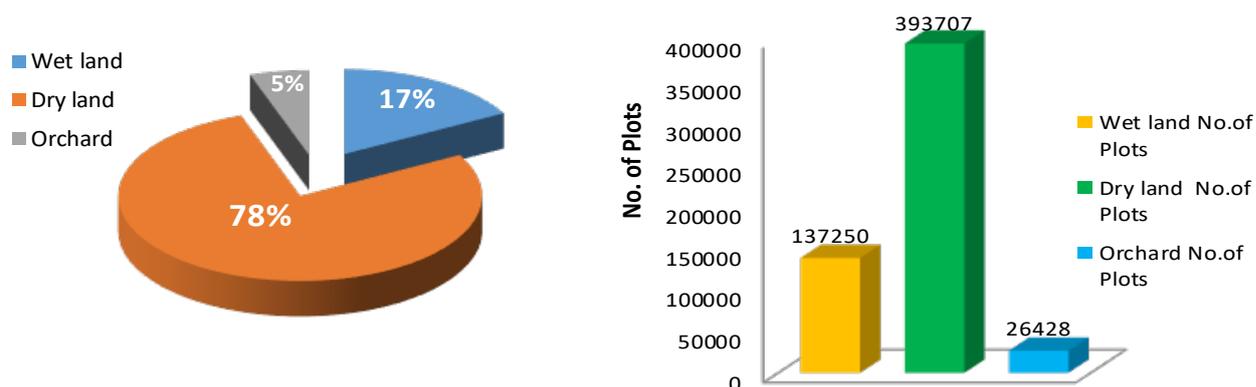
As illustrated in **Figure 3**, import of rice & vegetables show an increasing trend during the period. While the import of other cereals and fruits exhibit a fluctuating trend, import of edible oil shows a decreasing trend from 2014. Potatoes imports remained almost constant with insignificant increase in 2015.

2.3.4 Agricultural Land holding

As per MoAF, the total agriculture area is 2.93% of the country's total land area of 38,394 Sq. Km, which translates to 1,124.94 Sq. Km or 277,979.76 acres. The total registered agriculture land holding and land types in the country as per NLCS is illustrated in **Figure 4** and detailed in **Annexure IV**.

⁵ Statistical Year Book 2018

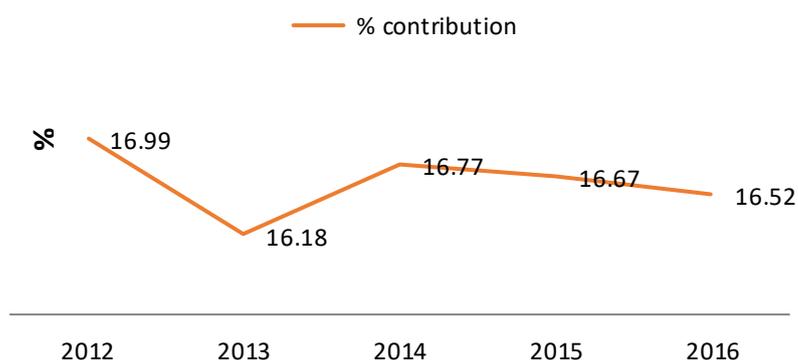
Figure 4: Agriculture Land holdings in acre and number of plots



2.4 Agriculture Sector Growth Rate and Contribution

As per the National Accounts Statistics, 2017, the share of RNR sector to the total economy was recorded at 16.52% as illustrated in **Figure 5**. Agriculture (crops) sector remained to be the main driver of the primary sector's growth in 2016 recording growth of 6.54%. The sector growth had remained slow for the fiscal year 2012-16, with its share of GDP hovering between 16.18% to 16.99% as shown in **Figure 5**.

Figure 5: GDP Contribution by Primary Sector



CHAPTER 3: FINDINGS

This chapter is divided into two parts. Part I highlights the positive initiatives and Part II discusses the shortcomings and deficiencies.

Part I: Initiatives and positive development

The RAA observed significant achievements by the Ministry in enhancing food self-sufficiency and security through improved production and food accessibility. Some of the notable initiatives and positive developments are presented below:

- 1) Development and implementation of the National Food and Nutrition Security (FNS) Policy of the Kingdom of Bhutan (2014) was one of the important positive development brought in by the MoAF. The FNS Policy sets out the overarching policy goals and objectives aimed at ensuring all people at all times have physical, economic and social access to safe and adequate nutritious food for a healthy and active life contributing to realization of GNH.
- 2) The Ministry developed the Agriculture Land Development Guideline (ALDG) in 2017. The development of ALDG is timely so that the Ministry's focus on land development is accorded the right priority in the 12th FYP. ALDG is expected to address some key socio-economic problems such as youth unemployment, rural-urban migration, farm mechanization and large-scale commercial agriculture.
- 3) The Marketing Policy (2018) spells out key interventions and instruments in the marketing of RNR produce and products. The policy covers RNR sectors to enable small producers to commercialise their production and add value to their primary produce. The marketing policy is expected to enhance RNR sector's contribution towards poverty alleviation, employment generation, rural development and economic self-reliance.
- 4) Bhutan is now self-sufficient in fruits and eggs with the self-sufficiency ratio (SSR) in 2016 standing at about 132 % and 100 % respectively.
- 5) With the implementation of the Royal Monetary Authority's (RMA) Priority Sector Lending (PSL) policy, investment in agriculture sector has found some place in the development strategy. The PSL is the outcome of the vision of His Majesty the Druk Gyalpo as articulated during His Majesty's National Day Address in Trongsa in December 2016. The PSL was launched in 2018 aimed to stimulate the cottage and small industries (CSI) sector as the engine of economic transformation through improved access to finance.
- 6) The DoA with support from Research and Development Centres in the Regions, agriculture sector in all Dzongkhags and Gewogs, and Information Management Section (IMS) publishes agriculture statistics on annual basis. The report contains information at National and Dzongkhag level on land use, crop area, yield, production, crop damages by wild animals and utilization of the crops cultivated in the country. The annual agriculture statistics report is an informative and useful

document at levels of management, planning, decision-making, research, to assess current and emerging issues and development of agriculture sector.

- 7) The Ministry created the RNR Statistics Division in August 2017 under the Directorate Services aimed at providing harmonized cross-sector information. The RSD is an assurance for developing a sound information management system and greater accessibility to major information and data hugely impacting influential decisions, also equally aiding the crucial assessments at all levels in the country.
- 8) The development of the Endowment fund for Crop and Livestock Conservation (2017) in Bhutan is one important initiative by the Ministry to address human wildlife conflict, losses due to natural calamities, and encourage continuity of farming as a main source of livelihood. Although there were compensation schemes for loss of livestock to the wild, there were no safety nets for loss of crops to the wild and farmers had to bear all the risks during conflicts that discouraged them from farming. The development of the endowment fund will ensure conservation of wild life as well as preservation of indigenous crops, livestock and traditional farming practices.
- 9) The School Agriculture Program (SAP) is one of the flagship program aimed at continuing to foster close linkage with the youths. As of June 2018, 315 schools were brought under SAP. It is estimated that 195 MT of vegetables, two million eggs and 72 MT of pork will be produced annually by the schools, greatly contributing to food self-sufficiency and nutrition. This translates to about 5% increase in the contribution of SAP to total food basket from 2013 to 2017.

Part II: Shortcomings and Deficiencies

The RAA's review and analysis of available documents and information on food self-sufficiency and security revealed various shortcomings and deficiencies that undermine achieving the overall food and nutrition policy goals and objectives. The inadequacies observed during the review are discussed below.

3.1 Inadequacies in institutional arrangement for an integrated approach to enhance food security

Food and Nutrition Security is multi-dimensional constituting four aspects that are food availability, food accessibility, food utilization and food stability. As per the FNS Policy, the mandate for food and nutrition security lies with the MoAF who is responsible to lead and coordinate the overall implementation of food security policy and strategic action plans. On the other hand, the Ministry of Health (MoH) has the mandate for nutrition security programs. However, in order to achieve the national goal of food self-sufficiency and security through access to quality and safe food at all times, various sectors and agencies have a major role in one or more of the aspects of food security. Accordingly, FNS Policy proposes formation and involvement of several ministries and institutions to work together to ensure their programs relate appropriately and contribute to the immediate and longer-term food and nutrition security policy objectives.

However, RAA noted that no such institutional arrangement exists for a coordinated and integrated approach for meeting the collective goal of food security. There exist inadequacy in institutional linkages amongst relevant Ministries, Gross National Happiness Commission (GNHC), National Land Commission Secretariat (NLCS), Bhutan Chamber of Commerce and Industries (BCCI), Farmers Cooperatives, Food Corporation of Bhutan Limited (FCBL) and other relevant agencies to take ownership in implementation of the FNS policy and other issues related to food security. There is minimal or no communication amongst relevant agencies for a systematic and cohesive approach both at central and local government levels, which would inevitably impede effective implementation of FNS policy.

As a result, Ministries and agencies have not been able to report, monitor and evaluate the implementation of FNS Policy. Moreover, in absence of an institutional arrangement for strategic directions related to food and nutrition security, the national goal, strategic plan and decisions on food security issues may not be appropriate.

3.2 Lack of comprehensive land classification and agriculture zones

Arable land in Bhutan is under continuous threat from varied sources such as urbanisation, land degradation, and environmental issues. As such, it is vital to have a comprehensive land classification and agriculture zones for effective regulations and monitoring of land use and management. Proper land classification and zonation describes land in terms of its inherent physical characteristics, and indicates measures needed to

protect the land from degradation. The physical characteristics help identifying constraints on the land, the fewer the constraints, the greater its value for agriculture.

MoAF conducted land cover and land use assessment in 1995, 2010 and 2016. While the assessment of 1995 reported Bhutan's arable land to be 7.85%, assessment reports of 2010 and 2016 reported cultivated agriculture land to be 2.93% and 2.75% respectively. Accordingly, MoAF claims to have classified land into agro-ecological zones for land-use planning, separating areas with similar sets of potentials and constraints for assessment of land suitability and potential productivity.

The RAA noted that, the reports (2010 and 2016) included only those agricultural land that were cultivated at the time of land cover assessment classified as wetland (chhuzhing), dry land (kamzhing) and horticulture land. It does not report on the overall land classification and agricultural zones in the country. As such, the total area of arable land in the country is unknown. However, the arable land figure of 7.85% (1995) is still being used by government agencies for various planning and decision making which was based on relatively simple methodology and limited technical capacity.

Moreover, the land classification accounts only the land cover type and not the actual land category lacking physical characteristics of the land/soil that is important for effective utilization of land and protection from degradation.

RAA was informed that the National Land Policy (2011) is still in draft form and as a result, the MoAF does not have a strategic plan for land use management, impeding effective land utilization initiatives in the country. Further, Section 6 of the Land Act 2007, which requires NLCS to lay down policies, programmes, regulations and guidelines in accordance with the provisions of Act also remains unimplemented. The finalization of the policy is expected to substantially address the issue.

In absence of a comprehensive land classification and agriculture zones, integrated land use and management to enhance productivity and contribution to social, economic and environmental development cannot be ensured. Further, uncertain understanding and inventory on the total arable land in the country will impede effective reporting, monitoring, informed decision-makings and prudent operations of agriculture functions.

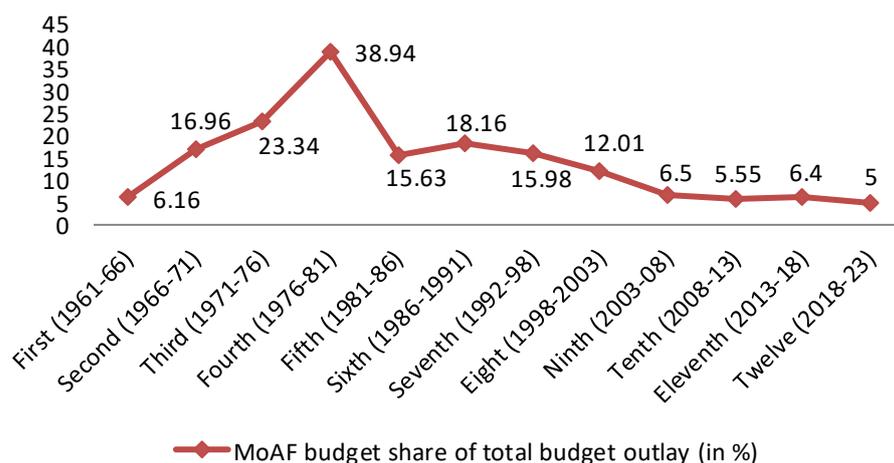
3.3 Declining share of budget allocation to Agriculture Sector

The agriculture is the largest sector in terms of its share in employment (57.2%). Agriculture sector remains the main driver of the primary sector's growth in 2016 recording a growth of 6.54%⁶ with growth contribution of 0.41%, almost the same as in 2015. The growth is attributed by increased production of potato, chilli and paddy. Agriculture is critical both for economic development and poverty reduction as most of the poor live in rural areas and depend on agriculture for their livelihood.

⁶ Annual Report 2016/17, RMA

The RGoB and MoAF has been trying to achieve food self-sufficiency since the inception of the FYP. Accordingly, Goal 1, Objective 1.1.1 of the FNS Policy aims to increase investment in agriculture, livestock and forestry program to increase food production, yet the MoAF continues to be allocated comparatively the least budget. The MoAF was rendered highest priority in the early years of planned development however, the figure declined over successive plan periods as presented in the **Figure 6**.

Figure 6: MoAF budget share of total budget outlay (in%)



As transpired from the **Figure 6**, RNR sector was allotted high budget during the earlier plan periods. The sector has received the highest budget during the fourth FYP constituting 38.94% of the total budget outlay (FYP), which has dropped to 15.63% in the fifth FYP. Since then, the RNR Sector's budget has been declining over the plan periods to the extent of 5.5% in the 10th FYP and 6.40% in the 11th FYP. However, the budget in absolute terms have increased from Nu. 430.80 million in fourth FYP to 13,642.88 million in 11th FYP.

RNR sector's strategic plan document continues to boost food self-sufficiency and security through adopting it as one of its four policy objectives in addressing poverty alleviation and balancing regional development. However, with declining trend in budget, reassuring self-sufficiency and security remains a challenge.

The allocation of budgets to local governments is based on the resources allocation formula that takes into account the principles of equity, transparency and objectivity. This system offers higher flexibility in prioritization of programmes and activities. However, there is no such system for allocation of budgets at the Ministry level. GNHC allocates total budget outlays to Ministries within which they are required to plan their programmes and activities.

Limited investment in agriculture may result in reduced government support to farmers, which in turn may lead to non-achievement of national goal of food self-sufficiency and security. Thus, there is a need for an effective system in prioritization of budget to various

agencies to ensure allocation of budget in equitable manner to enable agencies to meet different mandates and responsibilities they are entrusted with.

The MoAF responded that the budget allocation for RNR sector for the 12th FYP is 2.6% of the total outlay and correlating performance of the Ministry with budget allocation may be useful.

The RAA did not receive response from GNHC.

3.4 Agriculture land not fully utilized

The national agricultural land information is maintained by MoAF and NLCS. The MoAF publishes annual agriculture statistics reports based on survey carried out by DoA. The reports contain information on land use, cultivated area, production and yield of principle crops. The survey includes only those farming households that are engaged in agriculture activities excluding the empty households (Gungtongs) and households having land but not engaged in agriculture. On the other hand, information on agriculture land maintained with the NLCS is as per registration of land in Thram.

Bhutan has a total area of 38,394 Square Km out of which 2.93%⁷ is cultivated land as per MoAF that accounts for 1,124.94 square km i.e 277,978.72 acres. On the other hand, information from NLCS on gewog wise classification on wet land, dry land and orchards showed a total of 433,007.50 acres (1,752.31 Sq Km) of land i.e. 4.56% of the total area.

The summary of cultivated land as per MOAF's agriculture statistics reports for 2012-16 is presented in **Table 1**.

Year	Dry Land (in acres)					Wet Land (in acres)				
	Dry land Own Cultivated (A)	Dry land left Fallow (B)	Dry land Leased -In (C)	Operational land holdings (D) = (A+B+C)	Dry land left Fallow in % (F) = (B/E*100)	Harvested Area	Wet Land left fallow	Wet Land Leased in	Operational land holdings	Wet land left Fallow in %
2012	98,135	44,166	1,636	143,937	30.68	48,945	8,183	3,693	60,820	13.45
2013	93,562	39,890	2,475	135,927	29.35	NA	NA	NA	NA	NA
2014	86,041	48,856	2,804	137,700	35.48	NA	NA	NA	NA	NA
2015	82,086	53,377	2,465	137,928	38.70	49,325	6,345	NA	NA	NA
2016	75,550	51,279	2,206	129,036	39.74	53,055	6,402	NA	NA	NA

As transpired from **Table 1**, dry land own cultivated shows a decreasing trend from 98,135.00 acres in 2012 to 75,550.00 acres in 2016. Correspondingly, there is an increase in the fallow land from 44,166.00 acres in 2012 to 51,279.00 acres in 2016. On the other hand, wet land own cultivated increased from 48,945.00 acres in 2012 to 53,055.00 acres in 2016. During the same period, the fallow wet land saw a decrease from 8,183.00 acres to 6,402.00 acres.

⁷ Land cover assessment, Land Cover Mapping Project (LCMP) in 2010, MoAF

Since the statistics on fallow land obtained from MoAF does not include those empty households and households having land but not engaged in agriculture activities, the actual figure on fallow land was calculated based on the agriculture land information obtained from NLCS. The working of actual fallow land and resultant estimated production loss for 2016 is presented in **Table 2 and 3**.

Particulars	Wet land		Dry land	
	No. of Plots	Area (Acre)	No. of Plots	Area (Acre)
Registered land (NLCS) as of 22/05/2017 (A)	137,250	73,623.33	393,707	336,567.88
Cultivated land (MoAF) (B)	NA	53,055.00	NA	53,485.00
Actual Fallow land as per RAA (in acres) (C) = (A - B)		20,568.33		283,082.88
Fallow land as per MoAF (D)	NA	6,402.00	NA	51,279.00

Source: Agriculture Statistics (2016) and NLCS

Land Type	Fallow Land (acre) (A)	Types of Crop	Estimated Production (Kgs/acre) (B)	Estimated Production Loss (MT) (C) = (A*B)/1000
Dry Land	283,082.88	Maize	1,449	410,187.09
Wet Land	20,568.33	Rice	1,604	32,991.60

Source: Agriculture Statistics (2016) and NLCS

As shown in **Table 2**, in the year 2016, out of the NLCS' total registered 73,623.33 acres of wet land holdings, 20,568.33 acres remained uncultivated. Similarly, out of the total registered 336,568.88 acres of dry land holdings, 283,082.88 acres were left uncultivated.

As per the workings, during the year 2016, the estimated production loss for 20,568.33 acres of wet land accounts to 32,991.60 MT of rice calculated at an average of 1,604 kgs of paddy yield per acre. Similarly, if the dry land left fallow were used for maize production, the estimated production loss for 283,082.88 acres of dry land accounts to 410,187.09 MT of maize. The fallow land could have been also used for the production of other crops.

The lands were left fallow mainly because paddy cultivation is labour intensive and there is shortage of people willing to work. Further, crops being damaged by wildlife and lack of irrigation water discouraged farmers to grow rice. The nation-wide practice of leasing land to others and receiving 50% of the yield is also declining as farm workers prefer to work on wages due to high rates. Despite experiencing an increasing trend in the fallow land over the years, there is a lack of remedial policy intervention and strategic coordinated approach from NLCS and MoAF to address the issue. Increasing area of land remaining uncultivated may result in non-achievement of Ministry's self-sufficiency target.

The MoAF in its response expressed the importance of reversion of fallow land for ensuring domestic food availability. Accordingly, the Ministry has prioritized fallow land rehabilitation in the 12th FYP. Further, discussion are underway to take land

development as flagship program, land use certificate is under implementation and land conversion guidelines is being revised.

While the RAA acknowledges the policy intervention that are underway by the Ministry, there is a need to ensure effective implementation of the initiatives and interventions considering the increasing area of fallow land in the country.

3.5 Increasing trend in food dependency undermining self-sufficiency in longer run

Food self-sufficiency remains a difficult task mainly because of huge imports of food items. Bhutan’s dependency on food items especially rice has increased over the years with agriculture sector’s contribution to the national economy decreasing from 44% in fourth FYP to 2.3% in 11th FYP. The import on major food items aggregated to 154,537.5 MT (Nu. 7,172.10 mill) in 2017, including 78,449.80 MT (Nu. 1,979.80 mill) of rice, which was the biggest expenditure among food import. This was abnormal considering that rice is the staple diet for Bhutanese and 57.2% of our people depend on agriculture.

It is evident that rice imported from India dominates Bhutanese market due to lower prices compared to Bhutanese rice because of lower cost of production and higher productivity in India. The volume and value on rice imports during 2012-17 is illustrated in the **Figure 7.1 and 7.2**.

Figure 7.1: Volumn of import in Metric tones

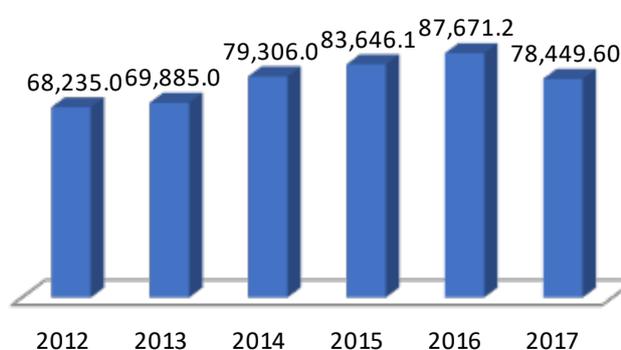
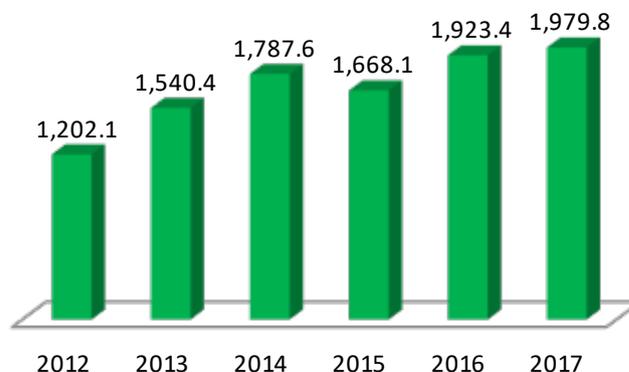


Figure 7.2: Value of import in Million (Nu.)



The imports of rice have been one of the common features in all Bhutan Trade Statistics (BTS) publications. Amongst the food commodities imported, rice constitutes the major proportion of imports. As illustrated in **Figure 7.1 and 7.2**, the trend shows an increase in rice imports, from 68,235 MT in 2012 to 78,449.6 80 MT in 2017 with a significant increase in 2016 (87,671.2 MT). The MoAF’s target is to reduce cereal import from 34% (2010) to 24% (2018)⁸ however, looking at the import trend the target may not be

⁸ National Field Crop Commodity Development Program, outcome 001 of increasing filed crops production for enhancing cereal self-sufficiency

achieved. This unstable level of rice import indicates that domestic supply has not been able to keep pace with the increased demand for rice over time.

Currently, we are 45%⁹ self-sufficient in rice implying that we import 55% of rice to meet our domestic demand. During 2016, of the 73,623.32 acres of registered wet land, 53,055 acres of land was cultivated producing 85,090.00 MT with an average yield of 1,604 kgs/acre. During the same year, Bhutan imported 87,671.22 MT at Nu. 1,923.4 million. Bhutan has not been able to capitalize on its potential in producing cereal with 14,166.33 acres (19.24%) of wet land remained uncultivated as of 22nd May 2017. One of the reasons for sustenance farming in Bhutan is because of low priced imports of cereals and other food products from India that discourages farmers to produce surplus for the domestic market.

Further, there is lack of information on the cost of production of Bhutanese agricultural commodities. As a result, analysis on cost of production on Bhutanese commodities against retail price of imported commodities is not possible. MoAF's consistent efforts in enhancing food productivity had reduced the imports to some extent however, increasing production and reducing imports is a challenge, which is on constant rise that may undermine food self-sufficiency and security in longer run.

The statistics on rice production and trends of imports provide enough evidence that the current agriculture sector growth and flagship programmes do not exhibit the sectors' growth in real terms. The increasing trend in imports indicates inadequacy in the current strategies and programmes in achieving the national targets of self-sufficiency and reduced imports. There are no signs of improvement in the imbalance of food production against demand which if continues is worrisome. This is a huge concern seeking the attention of the government where proper research and review of the current situation needs to be initiated to ensure the strategies and programmes more relevant and effective.

The MoAF responded that analysis on increased food imports would be more conclusive taking into consideration population growth, per-capita consumption, purchasing power, floating population and cost of production.

The RAA would like to reiterate that there is a need for proper research and review of current situation for ensuring and strengthening strategies and programmes that are more relevant and effective.

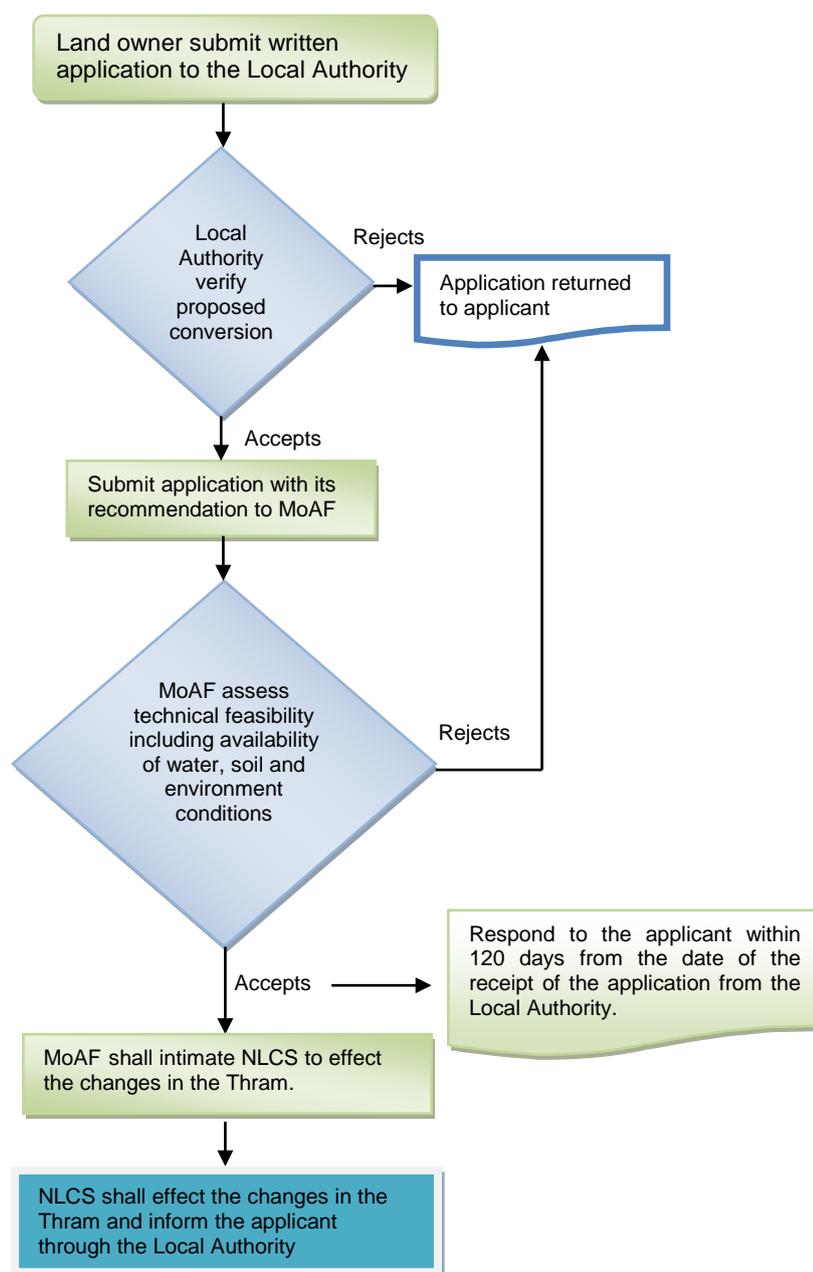
3.6 Conversion of land to non-agricultural purposes

3.6.1 One of the most critical risks posed with food self-sufficiency and security is the loss of agriculture land to other developmental activities and urbanisation through conversion.

⁹ National dietary energy consumption status & self-sufficiency ratio (Nov. 2015)

Section 91 of the Land Act of Bhutan, 2007 states “In case of conversion of Chhuzhing to other land categories for purposes other than residential land, such conversion may be processed in accordance to Section 166 of this Act”. The procedure for conversion of Chhuzhing to other land categories as per Section 166 is illustrated in **Figure 8**.

Figure 8: Flow chart for conversion of wet land to other land



The NLCS as per the procedure prescribed under Section 166 and presented in **Figure 8** shall approve and effect the land conversion from Chhuzhing to other land categories except for residential purposes. Further, the NLCS shall approve conversion of Chhuzhing to residential purpose as per Section 92 of the Land Act of Bhutan 2007, in accordance with Sections 167 to 169 of the Act.

During the period from 1998 to 31st August 2018, 1,005 cases were recommended by MoAF to NLCS resulting in conversion of 712.95 acres of prime agricultural land. The Dzongkhag wise agricultural land conversion for non-agricultural purposes is provided in **Annexure V**. The Dzongkhag with large conversion of Chhuzhing during this period was seen in Punakha (162.52 acres), Dagana (85.29 acres), Thimphu (82.06 acres), followed by Paro (69.26 acres), Wangdue Phodrang (52.43 acres), Samtse (52.40), and Trashigang (33.69 acres). Besides individual cases of land conversion, there are several cases of agricultural land conversion each year to accommodate other development activities such as construction of hydropowers, towns, roads, institutions, housing, etc.

As a case in point, huge areas of wetland were lost to development of new township and residential areas such as Changjiji and Babesa in Thimphu, Tshongdue in Paro, Bajo in Wangduephodrang, Khuruthang in Punakha, amongst others. The statistics on land conversion does not include those illegal conversion, abandoned wetlands, and environmentally affected lands. These conversions often take place with very little or no consideration of the land capability. Further monitoring by relevant authorities is not adequate as there may be cases of wetland conversion that they are not aware of. Absence of a land policy for proper land use management is believed to be the main cause for loss of agriculture land. Farm mechanization is also a challenge as most of the flat lands are lost and production of main staple (rice) has also reduced significantly.

The increasing trend in loss of wetlands will have serious consequences in long run undermining the national policy of enhancing availability of safe and adequate varieties of food to meet food requirements of the population at all times.

3.6.2 The national level data on conversion of wetland to other categories is maintained by MoAF and NLCS. On review of the database on types of land conversion obtained from MoAF and NLCS, RAA observed discrepancies in figures of wetland converted to Khamzhing as presented in **Table 4**.

Sl.No	Dzongkhag	MOAF recommended		NLCS approved	
		No. of cases	in acres	No of cases	in acres
1	Chukha	10	10.737	2	0.69
2	Dagana	82	85.296	35	25.16
3	Gasa	3	1.03	0	0.00
4	Haa	0	0	0	0.00
5	Lhuntse	9	3.787	9	7.13
6	Mongar	9	5.789	7	3.55
7	Pemagatshel	7	7.14	2	2.34
8	Paro	132	41.12	14	7.97
9	Punakha	131	117.516	133	87.66
10	Samtse	42	45.81	7	8.38
11	Samdrupjongkhar	7	3.38	4	10.93
12	Sarpang	49	58.69	4	2.15
13	Thimphu	129	64.36	106	31.54
14	Trashigang	46	32.721	6	5.19

15	Trashiyangtse	26	11.518	5	3.03
16	Tsirang	44	42.84	8	4.18
17	Trongsa	16	6.953	9	4.69
18	Wangduephodrang	61	44.474	64	36.19
19	Zhemgang	0	0	3	3.88
Total		803	583.161	418	244.653

As per Section 166 of the Land Act of Bhutan, 2007 “If the conversion is approved, the MoAF shall intimate NLCS to effect the changes in the Thram. NLCS shall effect the changes in the Thram and accordingly inform the landowner and the agency acquiring it through the Local Authority”. However, the total land conversion recommended by MoAF does not match the figures of NLCS as shown in **Table 4**. For instance, the final land conversion approved cases by NLCS is more than that of recommended by MoAF for Punakha and Wangduephodrang Dzongkhags,

There exist no system to share information on land conversion between NLCS and MoAF. RAA was informed that the MoAF is required to clarify on the conversion cases if any by NLCS, however, the final cases approved by NLCS is not shared with MoAF. The discrepancies in the land conversion figures indicated lack of coordination between MoAF and NLCS and systemic flaws in recording and reporting of vital information. Such discrepancies and lapses may impede effective monitoring and informed decision-making.

3.7 Non-achievement of 11th FYP food production target

As per the RNR Sector’s 11th FYP document, the DoA has four programs aimed at ensuring food security and increased income through improved management of arable land, production of varieties of food crops, and development of agriculture infrastructures. The plan document clearly sets out the plan targets, activities, and responsible agencies. DoA’s programs is focused on key measures aimed at increasing the farm productivity through targeting of essential food crops to contribute to enhance national food and nutrition security.

DoA’s plans and programs during 2013-18 and its progress is detailed in **Table 5**.

Food crops	11 th FYP target to be achieved by June 2018 (in MT)	Average annual production for 2012-17 (in MT)	Achievement against 11 th FYP target (in %)
Paddy	98,894.00	80,800.40	81.70
Maize	88,365.00	82,552.40	93.42
Other Cereals	36,478.00	10,867.20	29.79
Oil seeds and Legumes	7,000.00	2,925.00	41.79
Vegetables	63,456.00	54,726.00	86.24
Citrus	67,273.00	32,938.40	48.96
Potato	78,072.00	53,880.80	69.01
Fruits and Nuts	38,856.00	57,215.00	147.25
Mushroom	119.30	51.80	43.42

As transpired from **Table 5**, the 11th FYP achievement in food productivity for various food commodities ranged from 29.79% to 147.25%. The comparison have been done based on the target of 11th FYP and average annual production for period 2013-17 as the statistics on food production for 2017-18 was not available during the time of audit. Most of the food production targets were not achieved expect for fruits and nuts. The production of fruits and nuts have been impressive with target achievement of 147.25% prior to the end of the plan period. From the working in **Table 5**, it may be concluded that the Ministry was not successful in achieving the targets for food crops with low achievement as the period not included in the working is only one year. For instance, production of cereals wheat, buckwheat, barley and millet hovered around 30%. Similarly, production of oil seeds & legumes, mushroom and citrus were 41.79%. 43.42 and 48.96% respectively. Paddy and vegetables production on average experienced an achievement of 81.70% and 86.24% respectively.

The Ministry have shown remarkable progress in production of maize, vegetables, and food and nuts during 2012 to 2017. While production targets for some food crops are achievable, there are food crops such as citrus, oil seed and legumes, and other cereals whose production targets may not be achieved.

The MoAF in its response stated that the achievement of production target was calculated as an average of 5 years, which is technically incorrect. Ministry explained that target is based on annual progressive increasing trend where production figure for the last production year of the plan period is planned achievement.

The RAA acknowledges the response of the MoAF. Accordingly, the RAA compiled the annual progressive increase/decrease in food production during 2012-2017 as presented in the **Table 5.1**.

Food Crops	Target June 2018 (in MT)	2013	2014	2015	2016	2017
Paddy	98,894	75228	77,038	80,261	85,090	86,385
Maize	88,365	75717	77,244	83,714	82,035	94,052
Other Cereals	36,478	12,887	10,163	10,575	9,642	11,069
Oil seeds and Legumes	7,000	3,269	3,114	2,687	2,789	2,766
Vegetables	63,456	46262	49,681	52044	56,216	69,427
Citrus	67,273	33,469	45,226	15,977	42003	28,017
Potato	78,072	50,390	53,612	49,359	58,820	57,223
Fruits and Nuts	38,856	56,603	68,692	39,252	66,872	54,656
Mushroom	119	19	17	19	82	122

Table 5.1 shows both achievements and possibility of non-achievements of production targets of food crops. As transpired from **Table 5.1**, food production of citrus, oil seeds and legumes, and other cereals have not been progressive. The unachieved plan activities

may undermine the purpose of various programmes initiated for realising the intended outcomes.

3.8 Lack of Subsidy Policy

Agricultural subsidies are provided to ensure access and use of more productive agricultural inputs for increase production and profitability, and to reduce farmer's vulnerability to food insecurity and poverty. Given Bhutan's geographic conditions, need for subsidy is even greater as farming is difficult. Thus, a country like Bhutan where 57.2% of the population depends on agriculture for their livelihood, a policy is inevitable on agricultural subsidies to be rendered adequately, efficiently and in a uniform manner.

RAA observed that there is no formulated policy on subsidy to incentivize and encourage farm production and promote food security. While the MoAF drafted a policy on subsidy in 2010, it is still in draft form as of the date of audit. The draft policy on subsidy indicates that the existing subsidy activities lack explicit and clear policy criterion with interventions too thinly spread in many activities, thus questioning its effectiveness on intended poverty alleviation, food security and farm income objectives. Currently, the Ministry has a modality in providing agricultural subsidies to farmers covering seeds, seedlings, fertilizers, machineries hiring and transport, electric fencing, green houses, postharvest structures, compost structures and mushrooms as detailed in **Annexure VI**.

Although the modality is observed while providing subsidy, there is no prescribed criteria in identifying beneficiaries. As a case in point, Thimphu Dzongkhag provides subsidies to farmers to enhance their livelihood by elevating farm inputs. Green houses, electric fencing, seed & seedling are some of the assistances provided by the Dzongkhag, which is subject to availability of fund and requires recommendations of the agriculture official based in gewogs. Information on total applications received, approved and disapproved by the Dzongkhag was not made available. Subsidies (green house and seed & seedlings) were issued to applicants through the gewog agriculture official without a standard procedure, which may lead to ineffective support and subsidies. In general, there is no standard for ensuring those subsidies provided are uniform across all programs, Departments and Dzongkhags.

Absence of clear procedures in providing subsidies may result in unachieved goals and expectations as intended. Such practice may invite criticism and undermine the objectivity of providing subsidy. Moreover, there are various agencies, multiple departments within the MoAF who provide subsidies viz. seeds & seedling, greenhouse and electric fencing. Further, subsidies are based on availability of budget that pose challenges while planning at both agency and beneficiary level. Appropriate subsidy policy will effectively enhance food productivity and address issue of cheap import of agricultural products.

The MoAF agreed that the existing subsidies needs to be reviewed and revised. Accordingly, the Ministry had submitted a proposal to MoF however, there is no positive outcome. The Ministry have initiated a cost-sharing mechanism to fully

institutionalise the existing subsidies aimed at enhancing the efficiency and transparency.

Having a subsidy policy will incentivise and encourage farm production besides promoting objectivity in distribution of subsidies. Thus, there is a need for the Ministry to finalise and implement the subsidy policy expeditiously.

3.9 Inadequate crop compensation schemes

As per the agriculture statistics 2016, crops damaged by wildlife was the second highest farming constraint faced by the farming households constituting 40%, the highest being households affected by labour shortage (53%). The summary of crops damaged by wildlife during the period 2012-2016 is presented in **Table 6**:

Cereal Crops	2012	2013		2014		2015		2016			
	Est. area affected (acres)	Area lost (Acres)	Qty. lost (MT)	Annual Average Price (Nu./kg)	Loss in Nu. Mil						
Paddy	67.31	2,198	1,761	1,862	1,725	1,975	2,330	1,283	1,356	55	74.58
Maize	262.15	5,171	4,043	4,914	4,194	4,220	3,753	4,390	3,892	59	229.628
Buckwheat	4.4	271	141	216	115	304	153	389	200	44	8.8
Millet	1.98	125	46	165	94	121	63	374	60	98.33	5.8998
Potato	7.23	na	na	476	1,069	502	1,083	753	2,056	16.6	34.1296
Wheat	na	280	153	173	108	286	182	165	105	38	3.99
Barley	na	67	35	62	41	76	39	41	20	138.61	2.7722
Vegetable	na	na	na	191	196	429	373	421	412	25.2	10.3824
TOTAL	343.07	8,112	6,179	8,059	7,542	7,913	7,976	7,816	8,101		370.182

Source: Agriculture Statistics 2012-16

As shown in **Table 6**, the quantity loss of cereal crops for the period 2013-16 presents an increasing trend from 6,179 MT in 2013 to 8,101 MT in 2016, which is worrisome considering that majority of Bhutanese depend on agriculture. The RAA worked out the monetary loss for 8,101 MT of crops in 2016, calculated taking the annual average price per kg of different crops. During the year 2016, the monetary loss to farmers as a result of crops being damaged by wildlife amounts to Nu. 370.18 million. Further, it was estimated that farmers on average spend 47 days and 58 nights guarding crops from wild animal damages in 2016.

The RAA noted that, the presence of human settlement in the protected areas has created challenges in balancing conservation and rural livelihood. The Royal Government of Bhutan's (RGoB) integrated conservation and development program allows people to live within protected areas who farm, graze animals, collect plants and cut firewood. There are currently ten protected areas consisting of five national parks, four wildlife sanctuaries and one strict nature reserve. Once a land is declared as Government Reserve Forest (GRF), the land remains unutilized in terms of agricultural activity.

Out of the total area of Bhutan, 51.44% i.e. 19,750.57 sq. km is under protected areas and biological corridors that include protected areas of 16,396.43 Sq. Km, biological corridors

of 3,307.14 Sq. Km and conservation areas of 47 Sq. Km. It is estimated that about 41,566 people¹⁰ (5,902 households) reside in protected areas. Farmers pay their cost of living inside the protected areas by the loss of crops and livestock to wild life. The loss of crops has devastating impact to farmers, and on the other hand, retaliatory killing of wildlife is a challenge for conservation of species and biodiversity.

The Department of Forest and Park Services (DoFPS), MoAF has initiated and implemented national level human-wildlife conflict management strategy including introduction of insurance schemes and “semso” in villages for the loss of livestock to wildlife predation. The DoFPS between 2003 to 2014, has paid an aggregate of Nu. 8.15 million as compensation for the loss of livestock to wildlife details of which are provided in **Annexure VII**. However, there are no compensation schemes for crops damaged by wildlife and DoFPS has never given any cash compensation for the loss of crops to wildlife.

Recognizing the need to institute a safety net in case of human wildlife conflict, the Wildlife Conservation Division, DoFPS started an insurance scheme called the "Gewog Environmental Conservation Committee (GECC)" in 2011 for loss of crops and livestock to wildlife. As of the date of audit, there were 48 compensation and insurance schemes. Since the participation is based on membership fees and premium, not all farmers are covered under the scheme. Besides, there is no system of compensating farmers in case of crop damage by wildlife. As a result, farmers have to bear all the risk in case of conflicts that discourages them from farming.

The current situation and statistics on crops damage provide enough evidence that the initiatives and schemes to address human wildlife conflict are not adequate in facilitating development of agriculture. This warrants serious review to render the strategies and plans more relevant and effective.

3.10 Inadequate crop insurance schemes

Agriculture in Bhutan is highly susceptible to calamities such as insufficient irrigation supply, unproductive land, insects/diseases, drought, excessive rain, hail storm/wind and landslides/erosion. As such, it is necessary to protect the farmers from such risks and ensure that farmers will always have capital for investment in the next season, irrespective of their harvest.

MoAF have categorised about 11 farming constraints faced by the farmers that includes crop damage by natural calamities and insects/diseases. As per the Agriculture Statistics reports from 2012-16, crops damaged by insects/diseases have featured among top four constraints resulting in low food production and low quality of produce. Crops damaged by natural calamities include hail storm/wind, excessive rain, drought, landslides/soil erosion.

¹⁰ RSPN website

Presently, there is lack of agricultural crop insurance aimed at stabilizing farmers' incomes. While RAA noted emphasis on managing agriculture outputs through input subsidies, construction of infrastructure, capacity development, amongst others there is lack of agriculture insurance as a supplement to other initiatives in addressing production risks. In absence of affordable crop insurance, farmers are faced with difficulty in paying off their debts/installments when crops are damaged. Interviews with local farmers in Thimphu and Paro revealed that affordable crop insurance would encourage farmers to plant a larger variety and improving the diversity of agriculture produce.

Starting 2018, RMA introduced a Priority Sector Lending (PSL) with inclusion of modality of PSL-insurance for farmers. All crops under Priority Sector Lending are covered for insurance to substitute for collateral requirements and the insurance premium will be deducted from the loan amount, where applicable. The annual premium for crop is 2.9% on the sum insured (*i.e for every Nu. 100,000 worth of crop, the premium payable will be Nu. 2,900.00 per annum*).

As a case in point, in recent years Governments in developing countries have been increasingly involved in the support of commercial agricultural insurance programs. China is a striking example, where agricultural insurance market became the second largest market in the world in 2008 with support and premium subsidies from the central and provincial Governments. Similarly, India and Mexico have also developed, weather based crop insurance to protect farmers against the vagaries of the weather.

Affordable crop insurance scheme is expected to protect our farmers against crop failures and damages due to weather, disasters, pests or diseases. Therefore, it is desirable to have farmers' financial protection insurance pay-outs to improve their credit, and towards the growth of the agricultural and rural economy.

3.11 Limited credit facilities for agriculture sector

One of the most important inputs for an efficient agricultural production is the access to credit and loan facilities. There is limited access to credit at household level at discounted and affordable rate and the only means of credit is through financial institutions. Financial sectors in the country comprise of state-owned commercial banks, state-owned development financial institution, private commercial bank and foreign direct investment banks. At present, there are five commercial banks with the outreach of 128 branches. The total credit/loan provided by financial institutions to agriculture sector during the period 2008-2017 is presented in the **Table 7**.

Amount in Ngultrum in mill (end of June)										
Economic Activity	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Agriculture	562.2	658.1	492.2	657.5	1,116.1	1,514	2,287.1	3,487.4	4,456.9	5,069.5
BOBL	1.7	2	2.9	3.2	3	1.1	0.3	17.5	30.6	41.5
BNBL	-	-	-	-	-	-	0.8	0.7	0.7	0.7
BDBL	558.6	656.1	488.4	652.8	1111.3	1511.4	2283.7	3467.1	4414	5003.6
T Bank	-	-	-	-	-	-	1.5	1.5	1.4	0.4

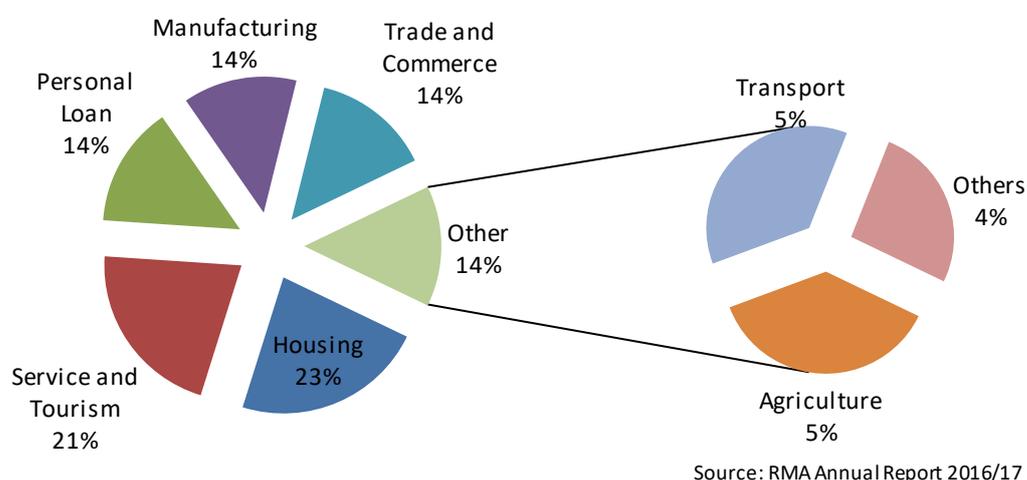
Limited										
Druk PNB Limited	-	-	0.9	1.5	1.8	1.5	0.8	0.6	10.2	15.7
RICBL	1.8	-	-	-	-	-	-	-	-	3.4
BIL	-	-	-	-	-	-	-	-	-	4.1
Increase in %		17.058	-25.2	33.58	69.749	35.651	51.063	52.481	27.8	13.745

Source: RMA Annual report 2016/17

As evident from **Table 7**, the share of credit facility to agriculture sector shows an increasing trend from 562.2 million in 2008 to 5,069.5 million in 2017. The highest increase was experienced in 2012 with an increase of 69.74% from the previous year.

However, credit to agriculture sector is negligible compared to credits in other economic sectors. During 2017, credit to agriculture sector accounted only 5.33% (Nu. 5,069.50 million) of the total credit from the financial institutions as illustrated in **Figure 9**.

Figure 9: Credit to economic sectors in 2016/17



BDBL alone financed 98.70% of the total agriculture loan portfolio in 2016/17. During the last decade, BDBL had been financing more than 90% of the credit to agriculture sector.

For the audit period 2012-17, RAA noted that there was no requirement for financial institutions to provide credit/loan facility to agriculture sector. However, with the formulation and implementation of the PSL in 2018, the agriculture sector is expected to experience some economic transformation in coming years. The PSL guideline does not require collateral and guarantor with interest rate of 8%, with maximum loan ceiling is Nu 500,000 for farmers and Nu. 10 million for Cooperatives and Companies.

Although Government have formulated low interest credit policy through RMA and financial institutions, the impact of this financial sector reform is yet to be seen. PSL policy provides loans to all farming households and does not distinguish groups and individuals who produce cereals and cash crops of national importance.

3.12 Non-maintenance of National Food Security Reserve

The National Food Security Reserve (NFSR) is an essential element of the FNS Policy of the Kingdom of Bhutan, 2014. One of the aspects of Food and Nutrition Security i.e. *food availability* in general can be ensured through domestic production and distribution of imported food through proper markets. The Food Corporation of Bhutan Limited (FCBL) is mandated to maintain the NFSR comprising of rice, oil and sugar in addition to logistic services for distribution of food items in the country. In addition to NFSR, FCBL is also required to maintain SAARC Food Security Reserve and the SAARC Food Bank both of which comprise of 180 MT of rice.

RAA observed that, the FCBL does not have the capacity to maintain the NFSR and SAARC food security reserve mainly due to lack of fund and storage capacity. Currently, FCBL is dedicated on facilitation of food trade within the country, neglecting food security reserves, which may have serious consequences to food security during national emergencies. The current storage capacity against the NFSR as estimated by MoAF is presented in the **Table 8**.

Requirements/Food items	Rice	Edible Oil	Sugar	Total (in MT)
Present FCBL depot capacity				9,717
Estimated NFSR for <i>one month</i> (MoAF)	9,704	1,267	845	11,816
Estimated NFSR for <i>three months</i> (MoAF)	24,646	3,801	2,534	30,982
SAARC Food Security Reserve				360
Food Security Reserve (one month)				12,176
Food Security Reserve (three months)				31,342

As transpired from the **Table 8**, the existing storage capacity of FCBL's 23 depots across the country is 9,717 MT. However, the NFSR including the SAARC food security reserve is estimated at 12,176 MT and 31,342 for a month and 3 months respectively.

The non-maintenance of the NFSR was reported by the RAA in its Performance Audit report of FCBL (AIN: 14129) issued on 6th January 2017. The report highlighted on irrelevancy of the existing food reserve level due to growing population that may not be adequate during emergencies and natural disasters. The RAA was informed that the MoAF had assessed the food security reserve based on the population and per capita consumption in case of national emergencies, however, the NFSR proposal is still in draft form.

There is a need for the Government to facilitate in strengthening the existing NFSR in preparedness for unforeseen national emergencies and natural calamities.

The MoAF responded that the NFSR was approved by the RGoB in July 2018 and is now integrated in 12th FYP to be implemented by FCBL. However, NFSR requires budget of Nu. 497 million to kick start operationalising it and GNHC is yet to allocate the fund.

There is a need for the Government to ensure maintenance of the NFSR fulfilling the requirement under SAARC Food Security Reserve and the SAARC Food Bank.

3.13 Lack of need assessment and impact assessment for farmers' trainings

The MoAF had conducted numerous trainings to develop skills and knowledge of the farmers to enhance agriculture sector. Some of the program components are farmers' study tour, farmers' training for group formation, technical production and demonstrations, cash crop development, promotion of organic farming, soil fertility, feed and fodder development, community forest development, etc.

However, the Ministry had not conducted any need assessment for the farmers' trainings imparted to the farmers. Training need analysis identifies the performance gaps and determines what training will successfully address any skill deficit. Similarly, it is important for the MoAF to identify the kind of trainings that are required by the farmers and aspiring farmers to learn new skills and to enhance the production.

Furthermore, the impact assessment for the farmers' trainings conducted so far has not been carried out although farmers' training has been observed as one of the frequent activities of the Ministry and as well as Dzongkhags and Gewogs involving huge resources of the Government. Further, the RAA noted that there is no effective coordination among MoAF, Rural Development Training Centre (RDTC) and Dzongkhags on the trainings conducted by them. The MoAF does not maintain records on trainings provided by them or trainings conducted by the Dzongkhags and Gewogs, indicating that there is no coordination and information sharing amongst the agencies working towards a common goal.

A case in point, the RAA noted that School Agriculture Program is being conducted for the schoolchildren by the DoA which is also being conducted by the RDTC. The farmers' groups are also given various trainings on bookkeeping, office management, conflict management and leadership skills by both DoA and RDTC.

Without the need and impact assessment being carried out, it is difficult to ascertain whether the trainings imparted were relevant and beneficial to the farmers. Moreover, in absence of the records on the types of trainings provided by all these agencies, it is likely that same types of trainings might have been provided to the same group of people resulting in duplication of efforts and resources to attain the same objective.

The Ministry in its response expressed that the technical training and capacity building for the farmers are carried out purely on need basis. Training on farmers becomes imperative in view of emerging farming technologies, which needs to be adopted on a continuous basis.

3.14 Absence of pricing policy/guidelines

The cost of producing food in the country is generally high due to small scale of operation, labour intensive farming, high costs of transportation, increased costs of farm inputs, etc. In addition, there are few buyers and sellers relative to the number of producers that causes markets to be thin and prices volatile. This volatility often results in unpredictable and highly seasonal food prices, which have significant implications for food security. What is worrisome is that there is minimal or no mechanism to ensure price stabilization in the market that affects both farmers and consumers.

During the field visit made to the Centenary Farmer's Market (CFM) in Thimphu, the RAA noted that most of the seasonal agriculture produce from nearby villages are sold to intermediaries at relatively low rate depending on the supply and demand situation. Food is also imported from India which are sold to consumers at an exorbitantly high price with profit margin as high as 200%. There is no intervention by DAMC ensuring price stabilization that is based on the cost of production. Such practice leave consumers at the mercy of the intermediaries and sellers at CFM when the prices are high.

As a case in point, local fresh green chillies are available in the market from mid-April till October. During 2017, as per DAMC, the price of chillies was Nu. 800 per kg when it hit the market for the first time, which reduced to Nu. 70 per kg by November as the supply increased. From an economic point of view, neither very high prices nor very low prices are desirable or suitable. Interviews with consumers at CFM revealed that price spikes in essential commodities (chillies) discourage them to buy local produce and buy imported chillies, although illegal. Further, instances were reported where Bhutan Agriculture and Food Regulatory Authority (BAFRA) had seized banned vegetables indicating possibility of mixing banned vegetables with local produces at CFMs to be sold at higher rates. This may affect the market for local chillies and discourage our farmers to cultivate the same farm produce the following year.

In developed countries of Europe and America, the agriculture policy ensures that prices of food commodities produced within the country is announced well in advance to encourage farmers to produce and ensure farmers guaranteed return (minimum) on their investment.

RAA learned that the market system and infrastructure is inadequate resulting in loss of moving a product or services from producer to consumers that involves system of organisations, people, activities, information and resources. Further, there is lack of communication in relation to market information that weakens the marketing system and adds to price uncertainty. The buyback mechanism instituted by the Ministry through FCBL is also not effective. Thus, there is a need for DAMC to come up with a strategy based on cost of production ensuring a systematic and organised market for agriculture produce.

The MoAF disagreed with RAA and responded that, they are not in favour of having a pricing policy or regulating the market. The Ministry expressed that any attempt by the government to control prices would be against the principle of free market economy. Putting in place a pricing policy would essentially mean fixing legal minimum and maximum prices for food commodities, which cannot be favourable to both producers and consumers. Further, in long run, price control will inevitably lead to black market, food shortage and rationing, in addition to huge regulatory burden to the Government.

However, the Ministry stated that, there is a need for the Government to protect investment losses during market failure. The current buy back mechanism have been instituted for such situation and be continued until crop insurance system becomes viable and a norm.

The RAA agrees with the MoAF that the forces of supply and demand should govern a free market economy however, in practice, market economies must contend with some form of government influence through regulations. The RAA submission is not to fix food prices but to institute a regulatory mechanism on food prices through effective institution of policies or strategy based on cost of production to improve market accessibility.

Considering the price volatility of some essential food commodities in the market, there is a need for the Ministry to conduct studies and research on market dynamics and price volatilities to improve market access towards enhancing food security.

3.15 Inadequate monitoring and evaluation of Cooperatives and Farmer's Groups

The Cooperatives (Coops) and farmers' groups (FGs) are agricultural enterprises, jointly operated by group or groups of farmers for their mutual social, cultural and economic benefits. It is a community organization voluntarily formed to operate on specific or mixed enterprises by pooling together the available resources with members. As such, Cooperatives and farmers' groups can play a pivotal role in achieving and maintaining sustainable production as the local knowledge and practices developed over the years in collective management are shared in farmers groups who work together.

The initiative of establishing Cooperatives and Farmers' groups was started in 2010 by the DAMC, MoAF. As of July 2018, there were 67 farmers' cooperatives and 422 farmers' group registered with the DAMC as detailed in **Table 9**.

Name of the Sector	No. of the Cooperatives	No. of Farmer's groups
Agriculture	10	224
Livestock	41	101
Forestry	4	41
Non-RNR	12	7
Total	67	422

Source: DAMC, MoAF

Over the years, the DAMC had provided financial support and various equipment to the cooperatives and farmers' groups. In 2016-17 and 2017-18, the Department had supplied equipment worth Nu. 3.98 million and prior to 2016-17, the Department had given the financial support worth Nu. 3.00 million. Several capacity-building programmes as project tied support were also provided to members of farmers' groups for community leadership and management issues including record keeping, bookkeeping and financial management.

While RAA appreciates the initiatives of the MoAF in establishing the cooperatives recognizing its potential to contribute to rural development and self-governance, some of the inadequacies and lapses noted in the monitoring and evaluation of the Coops and FGs are as follows.

- a) As per Article 5(3) of the Cooperatives (Amendment) Act of Bhutan 2009, the MoAF is required to “monitor and evaluate co-operatives to ensure that they abide with and sanction those that have violated this Act; their Constitution and By-laws and the policies and rules of the Ministry”. However, there were no reports on monitoring and evaluation conducted by the Ministry indicating a lack of effective monitoring and evaluation system to track the effectiveness of Coops and FGs.
- b) Further, only three Cooperatives had submitted their annual financial statements to the MoAF as of the date of audit not fulfilling the requirement under the Article 5(2) of the Cooperatives (amendment) Act of Bhutan, 2009.
- c) As per section 109 of the Cooperatives Rules and Regulations of Bhutan 2010, “The initial registration certificate of Primary Cooperatives shall be valid for five years and can be renewed provided the Cooperative still meets the initial registration requirements, particularly the minimum membership requirement of 15 persons from a minimum of 15 different households”. However, the RAA noted only two Coops and nine FGs were renewed out of the total of 22 Coops and 168 FGs due for renewal as of July 2018.

These non-compliances indicate ineffective monitoring and evaluation on the management of the Coops and FGs. Absence of effective monitoring and evaluation has resulted in non-maintenance of vital information of Coops and FGs such as contribution to total production, performance, needs, etc. This may affect the Ministry in formulating appropriate strategies and intervention for facilitation and development of Coops and FGs, which may result in low food production and food accessibility.

The MoAF agreed that the Cooperatives Act of Bhutan specifies need for regular monitoring and evaluation, however DAMC could not conduct regular monitoring and supervision as the Department was more focused on promoting and strengthening farmers groups. Further, DAMC lacked financial and human resources.

The Ministry expressed that the Act is silent on the administering of actions/penalties the Department can take for non-compliances. Thus, the Ministry is in process of amending the Act, which will consider all the lapses and inadequacies on the extant Act. In addition, the Ministry is developing an online registration system for Coops and FGs to improve the information management system and monitoring of FGs and Coops.

While acknowledging the initiatives to bring institutional reforms through amendment of the Cooperatives Act, the Ministry should amend and implement the Act expeditiously. Moreover, monitoring and evaluation is a critical aspect of any activity/program to assess the status of implementation and overall effectiveness of activity/programs.

3.16 Farm Shops not meeting its intended objectives

A Farm Shop is a semi-business model offering local farmers the convenience of having multiple needs met in one location including output-marketing services without having to explore the whole town to attain related services at different stores.

With the approval of the concept and operationalization plan of the farm shop by the Cabinet, vide order No. C-3/67/683 dated 15th March 2015, the MoAF was directed to pursue the establishment of farm shop in 205 gewogs and FCBL to operate the farm shop. The Government (MoLHR, & DAMC, MoAF) and FCBL have invested a sum of Nu. 158.117 million from 2015-2017 for establishment and operation of the farm shops in the country¹¹. As per the records maintained with the FCBL, there are 173 farm shops across the country as of date of audit.

The objectives of the farm shop is to enhance access to RNR inputs and services including market information, enhance access to basic essentials to the local farming communities and serve as market outlets for all local RNR products. As such, farm shops has three functions to cater to the rural community. The first and the core function is buyback of RNR produce at guaranteed price from the farmers, which will be aggregated, graded, sorted, packaged and marketed. The second function is to sell RNR inputs (seeds, fertilizers, tools and animal feeds). The third function is to sell basic foods and household items (FCBL items, local agro products).

On field visit and review of book of accounts of the farm shops operated by FCBL, the RAA noted that there were no surplus agricultural produce bought by the FCBL from the farmers. On enquiry with the responsible officials of the farm shops in FCBL, the RAA was told the buyback prices determined by the MoAF was not found attractive by the farmers, so the farmers rather chose to sell on their own. Further, during the field visit no information on the market was available that could have helped farmers.

On comparison between the buyback price fixed for the 2018 by the MoAF and market price in Centenary Farmers' Market, Thimphu as of August 2018, the RAA also noted a

¹¹ Review of Farm Shops and Way Forward, DAMC, MoAF

huge variation between the two. A few instances on the differences in these two prices are presented in **Table 10**.

Farm produce	Buy-back price (per kg in Nu.)	Market price (per kg in Nu.)	Difference (per kg in Nu.)
Potato	16	30	14
Beans	30	110	80
Cabbage	14	36	22
Cauli flower	35	127	92
Carrot	22	88	66
Radish	10	56	46
Broccoli	25	88	63
Tomato	21	100	79
Green chilli (Big)	30	98	68
Apple	20	101	81
Ginger	14	142	128
Garlic	55	168	113

Source: Market prices obtained from Marketing & Research Division, DAMC

As it can be seen from **Table 10** there is a huge difference between the buy-back price and market price ranging from Nu.14.00 to Nu. 113.00 per kg for various commodities. It is likely that the farmers are encouraged to sell their produce in the open market than to sell it at the buy-back price to FCBL. Consequently, the main objective of the establishing farm shop to buy the agricultural produce from the farmers has not been achieved after having invested a huge sum of money in the establishment and operation of farm shops.

The MoAF disagreed with RAA's findings and stated that non-maintenance of book of accounts by the farm shops does not necessarily mean that the objectives are not met but indicates that open market situation was favourable and there was no need to sell through buy-back mechanism.

While taking note of response from the MoAF, it is to reiterate that the objectives of the farm shop is not met. The farm shop is functioning merely as an FCBL outlet selling basic foods and household items. Further, farm shop in-charge were not aware of buyback of RNR produce. Information on the market was also lacking that could have helped farmers.

Thus, there is a need for the Ministry in collaboration with FCBL to improve the effectiveness in the operation of the farm shops in fulfilling its intended objectives.

3.17 Inadequate Agriculture Infrastructure

Some of the inadequacies observed under agriculture infrastructure limiting food production and accessibility are discussed below.

a) Irrigation system

Irrigation water is one of the main inputs for agriculture development. Irrigation development in Bhutan was the result of farmer's own initiative and investment in the

construction and management of irrigation systems. The Government's involvement in irrigation sector started in the late 1960s. Since then, the Government built few large irrigation systems, which are now being managed by the community. Thus, there are two types of irrigation systems namely Community Managed Irrigation System (CMIS) and Agency built community managed irrigation systems.

As per the National Irrigation Master Plan (2016), there are 1,212 CMIS in the country covering an irrigated area of 64,248 acres. Of the total CMIS, 1,101 are currently operational and about 111 irrigation systems are dysfunctional partly due to damages caused by rural roads and landslides, and partly due to drying out of water sources. As such the 11th FYP target to bring 77,827 acres under assured irrigation remains unachieved.

2.93% of the total land area is cultivated land aggregating to 277,978.72 acres. Wet land constitutes 59,457 acres implying that there is adequate irrigation infrastructure for paddy cultivation in the country. In general, irrigation channels covers area of 64,248 acres of the total arable land implying that about 23% of the lands have irrigation infrastructures. However, irrigation infrastructures for dry land (Kamzhing) are virtually non-existent. This land use type constitute a major part of the total arable land and supports important commercial crops such as potato, fruit crops, maize and vegetables. Bhutan has a total of 336,568.87 acres and 22,815.378 acres of dry land and orchards respectively.

Bhutan has abundant water resources of 70,576 MSM per year but it is not necessarily used for irrigation. The water used for existing irrigation canals are those that flows from small rivers and streams in the headwater of the watersheds. Further, the engineering sectors in the Dzongkhags are overburdened with other infrastructure development activities such as building construction, rural roads, domestic water supply, etc. Irrigation system development at gewog level is confined to system maintenance and repair works lacking proper plan for development of irrigation systems.

Irrigation Policy (2012) recognizes the importance of monitoring and evaluation of the irrigation sector. However, there were no monitoring or evaluation reports on the existing irrigation facilities. Further, there is a lack of indicators for monitoring irrigation performance. For example, channel length, command area, repair and maintenance works carried out are the most commonly used indicators of irrigation development in the country.

As can be noted under **Para 3.6**, lack of irrigation water is one main reason for conversion of agricultural land to non-agricultural purposes showing the importance of irrigation facilities for enhanced food production, enhanced income resulting in improved access to food. Inadequate irrigation facility may result in low crop yields or no crop yield at all, affecting the food production capacity in the country.

The MoAF responded that the Ministry planned 108 major schemes to be executed during the 11th FYP however, due to lack of fund, only 41 schemes was implemented.

b) Storage facility

Agricultural produce are characterized by their perishability and levels of vulnerability to pests and spoilage. In general, control of temperature and relative humidity, and prevention of damage can increase shelf life, especially for fresh vegetables and fruits. As such, proper and adequate storage facilities are crucial to prevent such damages.

(i) Adequacy of storage facilities

The storage facilities are inadequate to market perishable goods such as cereals, fruits, vegetables and dairy products. The existing storage facilities in the country are inadequate to cater all Dzongkhags. The available storage facilities in the country is presented in the **Table 11**.

SN	Type of Store	Capacity	Qty.	Location	Commodity
1	Zero Energy Cold Store	25 MT	4	Paro, Dagapela, Zhemgang & Pema Gatshel	Apple and Oranges
2	Cold Store	60 MT	1	Paro (NPHC)	Apple
3	Cold Store	100 MT	1	Lingmithang, Mongar	Fruits
4	Walk in Cold Store	1 MT	3	Paro (NPHC) & Zhemgang	Research of fruits & vegetables
5	Household level Ambient Stores	1 MT	463	Throughout Bhutan	Maize seed store
6	Ambient Stores	1 MT	609	Throughout Bhutan	Potato seed store
7	Curing cum store	1 MT	42	Throughout Bhutan	Onion shed

Source: National Post Harvest Centre

As transpired from **Table 11** household level ambient stores capacity of one metric ton (MT) each for maize, potato and onion is available in all 20 Dzongkhags. However, cold storages for fruits and vegetables are limited to only few Dzongkhags. In total, there are nine cold storages located in Dagana, Monggar, Paro, Pemagatshel, and Zhemgang with total storage capacity of 263 MT mainly for apples and citrus as against total production of 126,772 MT of vegetables and 54,656 MT of fruits¹².

Post-harvest damage and losses is one of the main challenges faced by farmers in the country. RAA noted that there are no concrete and factual statistics available to assess the Post-harvest damages and losses. However, the National Post Harvest Centre (NPHC) had conducted a study on post-harvest damages and losses of oranges in the country that reported total damage to the orange production accounted 45.28%¹³. The post-harvest handling operation that includes lack/improper storage facilities accounted to loss of 31.20%. It was also reported that lack of proper storage and transportation facilities were the main factors leading to the damages and losses of the oranges and interventions were felt necessary in supporting the orange growers with proper storage and transportation facilities and educating the players of orange value chain in importance and economic

¹² Agriculture Statistics 2017

¹³ Post-harvest damage and losses of oranges in Bhutan (Sonam Tobgay, Dechen Tshering, and Dorji Rinchen)

advantages of proper postharvest handling. The total capacity for storing oranges is 203 MT as against the total produce of 28,017 MT during 2017.

Due to lack of storage, the farmers cannot store their harvest to be sold at the higher price season or off-season so that the harvests are available throughout the year. In addition, farmers far away from prosperous market are unable to reach market on time. As such, proper storage facilities at strategic locations are imperative in facilitating and supporting farmers/producers to enhance food crops productivity.

(ii) Utilization of the storages facilities

From the list of agriculture storage facilities as provided in **Table 11**, the RAA conducted a physical verification of the zero energy cold store located at Dagapela on 17th September 2018. The storage facility was constructed in the year 2012 at the cost of Nu. 2.739 million with the objective to store horticulture produce by using passive evaporative mechanism. This type of storage is considered economical, as it does not require electricity for operating to store agricultural produces.

During the physical verification, RAA observed that the structure was not utilised since inception as illustrated in **Figure 10**. RAA was informed that the cold store could not be used due to technical failure of the constructed structure. Moreover, the structure could not be taken over officially from the contractor due to numerous defective works in the structure.

Figure 10: Zero energy cold storage underutilized,



As such, the objective of constructing the zero energy cold storage could not be achieved besides the financial implication of Nu. 2.739 million to the Government. Therefore, a mechanism is needed to ensure completion and utilization of the facility for the benefit of farmers in the region.

The MoAF agreed with this finding and informed that the Marketing Infrastructure Guidelines that is in place is expected to address these issues to large extent.

3.18 Inadequacies in the Information Management Systems

The RAA reviewed the information management systems to ascertain the reliability, correctness and completeness of the information through adequate information collection,

management and dissemination as required by the Food and Nutrition Security Policy, 2014. Some of the systemic deficiencies noted by RAA under information management are discussed below:

a) Absence of an integrated Information Management System

Information management system in general is an integrated user-machine system that provides information to support operations, management and decision-making functions at various levels of an organization. Properly developed information management system is a necessary element for strategic planning, informed decision making, policy and program interventions to achieve the national goal of reducing food insecurity as required by FNS policy.

RAA observed that, there is absence of an integrated Food Information Management System for information collection, management and dissemination. Information is maintained by respective Departments and access to varied categories of information such as agricultural production, budget, trends, market prices, land classification, subsidies, irrigation schemes, storages etc. are limited as information are maintained by different responsible officers. Information was not readily available when focal officials are out of station.

MoAF is faced with complexities of functions and responsibilities striving to attain important national goals, therefore it must have a properly planned, analysed, designed and maintained information management system so that it provides timely, reliable and useful information to enable the management to take speedy and rational decisions. Food Security Information Management System with clear roles and responsibilities for various Departments and other key agencies involved in enhancing food security will facilitate and ensure a coordinated and integrated approach towards increasing food security.

b) Market information system for food prices not updated

Efficient market information provisions have been shown to have positive benefits for farmers, traders and policymakers. The DAMC, MoAF has developed a web based agriculture market information system for maintaining and disseminating market information to all. The system has the capacity to provide information under categories such as prevailing market prices of essential food items (imported and locally produced), market wise commodity details, periodic report and import and export information.

However, the web site does not provide updated and complete information on the market lacking timely market information dissemination. For instance, in July 2018, RAA generated reports on export and import of food commodities, but the information for the same was limited to year 2015 as illustrated in **Figure 11**. The export and import statistics from 2016 onwards are not available in the web.

Figure 11: Food commodities imported

Import Report				
Id	Commodity	Year	Improt	Country
1	Cheese	2015	1262.93Tonnes	India
2	Cheese	2015	0.03Tonnes	Singapore
3	Cheese	2015	1.67Tonnes	Thailand
4	Pork	2015	2.00Tonnes	India
5	Pork	2015	0.22Tonnes	Nepal
6	Pork	2015	0.12Tonnes	Singapore
7	Pork	2015	1.92Tonnes	Thailand
8	Beef	2015	4108.67Tonnes	India
9	Beef	2015	0.23Tonnes	Nepal
10	Beef	2015	0.07Tonnes	Singapore
11	Beef	2015	2.83Tonnes	Thailand
12	Chicken	2015	1369.00Tonnes	India
13	Chicken	2015	0.06Tonnes	Singapore
14	Chicken	2015	0.22Tonnes	Thailand
15	Fish	2015	2473.96Tonnes	India
16	Fish	2015	0.11Tonnes	Singapore
17	Fish	2015	5.34Tonnes	Thailand
18	Cardamom	2015	3.40Tonnes	India
19	Long Pipla/Pipling	2015	0.09Tonnes	India

Page: [First](#) [« Previous](#) [12](#) [13](#) [14](#) [15](#) [16](#) [17](#) [18](#) [19](#) [20](#) [21](#) [Next »](#) [End](#) Page 21 of 21

The reports generated on existing periodic prices and market wise prices for food commodities were not available for all regions. As illustrated in **Figure 12** the market price for food commodities in Trashigang during 2012 to 2017 was not available. Similarly, the Auction price for cereals and Pulses in Samdrupjongkhar during 2017 was not available.

Figure 12: Reports generated on periodic and market wise price respectively

Perodic price view

Select The Market: Trashigang *

Start Date: 2012-01-01 *

End Date: 2017-07-31 *

! Notice
No Prices Found

Market wise price view

Select The Market: S/Jongkhar - Auction *

Select The Commodity: Cereal & Pulses *

Start Date: 2017-01-01 *

End Date: 2017-12-31 *

! Notice
No Prices Found

DAMC have set up an Interactive Voice Response (2009) IVR/toll free number to provide easy access to prevailing market prices of food commodities in the country. However, RAA verification revealed that the IVR is limited to only b-mobile users and covers only four auction yards and the CFM. Moreover, the IVR information is limited to few commodities as compared with FCBL with difference in prices.

Marketing and Research Division, DAMC of its nature of functions is expected to develop and follow an independent route and strategies to gather information on market scenarios, however it was observed that the officials designated for the particular activity is dependent on the information available from other agencies such as Department of Revenue and Customs and FCBL.

The review revealed lack of market information resulting in losses in the supply chain, and making it difficult in facilitation of suppliers and consumers on market opportunities. There is lack of market information on prices of varied food commodities, demand and supply, current market situation and forecasts, food auction dates are key information for creating enabling market environment.

Reliable, accurate and complete information on market conditions may assist farmers in their marketing strategies. Farmers/Cooperatives/FGs could use the information in making strategic marketing methods to fulfil its market demand, increasing growth and development. On the other hand, incomplete market information can deter decision-making resulting in non-achievement of national goals of attaining food self-sufficiency and security. Further, information users or farmers may not rely on the market situation if Department continues with the practice of providing incomplete pattern of information.

The Ministry agreed that the current market information system is not able to provide the required services to relevant stakeholders to make informed decision(s). Accordingly, the DAMC with the support of the International Trade Centre (ITC) is upgrading the existing system, which once completed and operationalised will address the shortcoming to a large extent.

Market information system contains important baseline information that may be of continuous significance for the Ministry. Since the existing system is upgraded, there is a need to update the records, which would also facilitate appropriate migration to the new system.

Thus, there is a need for the Ministry to ensure updating and migrations of data from the existing to new market information management system for comprehensive information and proper decision-making.

CHAPTER 4: RECOMMENDATIONS

Based on the deficiencies and lapses discussed in Part-II, the RAA proposes following recommendations, which may be considered in initiating future plans and policies of the Ministry related to food security. The RAA recognises actions already initiated by the Ministry in certain areas, which are likely to address some of the inadequacies observed by RAA.

4.1 Ministry should establish proper institutional linkages for an integrated approach to achieve food security

The FNS Policy provides for formation and involvement of several Ministries and institutions to work together to ensure their programs relate appropriately and contribute to the immediate and longer-term food and nutrition security policy objectives. Full implementation of the Policy through coordinated and integrated approach of all relevant agencies will ensure informed decisions and appropriate strategic directions related to food and nutrition security in the country.

Therefore, the Ministry must spearhead and take the lead in formation of a high-level national committee to ensure their programs relate appropriately and contribute to immediate and longer term food and nutrition security policy objectives.

4.2 Ministry in collaboration with NLCS should formulate a comprehensive agriculture land classification and zones

At present, Ministry lack a comprehensive agriculture land classification and zones for an integrated land use management. Considering the importance of land mapping and zones, it is imperative that Ministry formulates a comprehensive land classification and zones on suitability of land for agriculture and non-agriculture purposes, which will ensure development of strategic plans for proper land use management in the country. More importantly, the Government must have a clear understanding and inventory on the total arable land in the country that will help natural resource planners, NLCS and MoAF in regulating and monitoring the land use and management in the country. Further, classification maps can be used to recommend the quality and quantity of rural land that could be zoned for agricultural production and protection from incompatible development.

Therefore, the Ministry should ensure land capability mapping to be completed at the earliest to identify areas that can sustainably support various uses such as agriculture or other development activities.

4.3 GNHC should develop a resource allocation formula

The Government had made investments into agriculture over the past plans that have benefitted rural farming households yet, it could not significantly transform the practice of subsistence agriculture. Unlike for local governments, the budget allocation for Ministries

is not based on a standard formula. It is desirable that GNHC further strengthen efforts to restructure and transform our subsistence farming practice through systematic and prioritized investment in enhancing production and productivity, expanding infrastructures, improving agricultural marketing mechanisms amongst others.

4.4 NLCS should finalise the draft National Land policy

The draft National Land Policy (2011) has not been finalised and the MoAF does not have a strategic plan for land use management, impeding proper implementation and land utilization initiatives in the country. The NLCS as the agency responsible to manage regulate and administer the ownership and use of land should finalise the draft policy that will ensure framework on land, coordinated use and management of land resources to enhance their productivity and contribution to social, economic and environmental development in the country.

4.5 Ministry should ensure sustainable use and management of agriculture land

The loss of agricultural land has huge potential to reduce food availability. The area available for most grain crops have been declining in the last decade and correspondingly the production has also decreased undermining the self-sufficiency targets. With only 2.9% of cultivated land in the country, and increasing cases of conversion of land to non-agriculture purposes, there is a need for an intervention on land development and sustainable land management through appropriate reforms. Further, there is no intervention or monitoring mechanism to monitor prime agriculture lands left fallow for strategic planning and use. There is also no policy support for facilitating labour shortage to meet peak agricultural labour demands.

Therefore, the Ministry should ensure sustainable development and management of arable land enhancing agriculture productivity. A policy on sustainable use and management of agriculture land will aid policy makers and planners to establish a common approach and practice for agriculture land development programs and activities across the country.

4.6 The MoAF should ensure maintenance of National Food Security Reserve with FCBL

The need to maintain a national level food reserve has been discussed since 1990s but the Government has not reviewed the food reserve level in preparedness for any national emergencies. There is no mechanism instituted by the Government to ensure maintenance of desired level of food reserves by FCBL. The current food reserve level maintained by FCBL is inadequate to respond during national emergencies considering the increase in population.

Therefore, the MoAF on a priority basis need to review the existing food security reserve and ensure food security in the country during national emergencies.

4.7 Ministry should finalize the subsidy policy

The draft policy on subsidy indicates that the existing subsidy activities lack explicit and clear policy criterion with interventions too thinly spread in many activities, thus questioning its effectiveness on intended poverty alleviation, food security and farm income objectives. In addition, subsidies are provided based on the availability of budget that poses challenges both to planners and farmers.

Therefore, an intervention in agricultural subsidies aimed at increasing food security is considered necessary. The government may consider having provisions of a higher level of subsidy in essential food commodities and prices in particular. In view of this, the Ministry should on a priority basis, finalize the agricultural subsidy policy to ensure effective implementation by the relevant agencies and stakeholders. It is recommended that subsidies to be standardized and applied uniformly across all programs coming through various agencies.

4.8 Ministry in collaboration with the financial institutions should come up with affordable access to credit and crop insurance schemes

Existing credit facilities and insurance schemes does not exhibit adequate support towards the growth of the agricultural and rural economy. Credit to agriculture sector has been negligible compared to credits in other economic sectors with only 5.33% in 2017. Further, crops damaged by natural calamities is one of the main constraints faced by our farmers and there is lack of support from the government and financial institutions aimed at stabilizing farmers' incomes ensuring availability of capital for investment in the next season, irrespective of their harvest.

The MoAF Government should study and formulate affordable access to credit and crop insurance schemes through involvement of financial institutions for agriculture development and growth.

4.9 Ministry should intervene and strengthen strategies to address Human wildlife conflict

Food crops damaged by wildlife and natural calamities are the main constraints faced by our farmers. In 2016 alone, farmers sustained an estimated monetary loss aggregating to Nu. 370.18 million as a result of human wildlife conflict. Incidences of human-wildlife conflict have undermined livelihood and abandonment of lands. The current situation and statistics on crops damage provide enough evidence that the initiatives and schemes to address human wildlife conflict are not adequate in facilitating development of agriculture.

This warrants serious review to render the strategies and plans more relevant and effective. It is desirable to have in place mechanisms to minimize conflicts through various strategies, adequate technical and financial resources and coordination amongst relevant agencies. Therefore, there is a need for the Ministry to introduce a sustainable

and viable compensation schemes to reduce such conflicts in local livelihoods, and sustain long-term protection of agriculture lands.

4.10 Ministry should develop and maintain food information management system

There is absence of integrated food information management system on information collection, management and dissemination, which is important to support operations, management and decision-making functions at various level of organisations. Currently the information are maintained by respective Departments resulting in limited access to varied categories of information such as agricultural production, budget, trend, markets prices, land classification, subsidies, irrigation schemes, storage facilities, etc.

Therefore, there is a need for the Ministry to develop a centralised food information management system that will facilitate and ensure comprehensive and up to date information related to food.

4.11 Ministry should maintain comprehensive market information

At present, Ministry lack a comprehensive market information on prices of varied food commodities, demand and supply, current market situation and forecasts, food auction dates are key information for creating enabling market environment. Considering the importance of market information for effective supply chain, and facilitation of suppliers and consumers on market opportunities, it is imperative that Ministry maintain accurate, complete, reliable and up-to-date market information.

Therefore, Ministry should strengthen the market information system at national and regional level involving relevant stakeholders such as private sectors, Cooperatives and FGs, FCBL, etc. through development of computerized information management system to enhance accuracy and reliability of information.

Besides, there is an urgent need to stabilize the huge fluctuation prices in the market with appropriate intervention and regulations by the Ministry. It is desirable that the Ministry conduct studies and research on market dynamics to come up with a strategy based on cost of production and appropriate intervention and regulations to improve price fluctuations and market accessibility.

4.12 Ministry should establish a robust system and strengthen its monitoring roles

Presently, there is lack of adequate monitoring and evaluation on the operation and functioning of the Coops FGs by the DAMC, MoAF. Absence of adequate monitoring and supervision of the Cooperatives and FGs has led to non-compliances, non-maintenance of vital information of Coops and FGs such as contribution to total production, performance, needs, etc.

Effective Coops and FGs have shown to have positive and significant contribution in growth of country's economy. Therefore, to ensure efficacy of the initiative initiated by

the Ministry as well as to ensure compliances to the prescribed law, there should be an adequate monitoring and evaluation system in place. Further adequate monitoring and supervision ensures safeguard of resources spent on development of such Coops and FGs ultimately providing value for money.

4.13 Ministry should strengthen existing market infrastructures

Although emphasis have been given in managing agriculture outputs through construction of marketing infrastructure, the statistics on production and export does not exhibit growth of agriculture sector in real terms. Lack of post-harvest facilities for perishable nature of vegetables discourages farmers to produce in mass quantities.

The Ministry should develop, strengthen and manage existing market infrastructures such as irrigation channels, cold storages and ensure infrastructures are strategically located to facilitate the marketing system and supply chain of produces. Further, Ministry should initiate measures in collaboration with FCBL to improve the effectiveness in the operation of the Farm Shops in fulfilling its intended objectives of providing market information and buyback of RNR produce at guaranteed price from the farmers.

4.14 Ministry should conduct training need analysis and impact assessment

There was no training need analysis or impact assessment carried out by the Ministry to ascertain any performance gaps and skill deficits of the farmers. Further lack of information on trainings imparted and uncoordinated approach undermines the purpose of training programmes initiated for realizing the intended outcomes and thus, resulting in waste of resources.

The Ministry should conduct need analysis and impact assessment on trainings imparted besides maintaining records of the various training programmes related to farmers and agriculture development. Further, the Ministry, RDTC and Dzongkhags should work closely on training programmes to achieve the common goal.

CHAPTER 5: CONCLUSION

Agriculture sector is an important source for employment and part of daily life for majority of Bhutanese population. The sector has the potential to not only empower rural livelihood but also contribute to economic development in the country.

MoAF has brought policy and institutional reforms towards achieving self-reliance through alleviation of poverty, empowering rural livelihood and increasing food security. Accordingly, the Ministry has contributed in increasing self-sufficiency of cereals, vegetables and fruits with access to markets, farm inputs and mechanization, construction of infrastructures, improved technologies, creation of farmer cooperatives and groups, implementation of flagship programs amongst others.

Despite having adequate legislative tools, policies, and MoA's concerted efforts, the Ministry is faced with numerous challenges and barriers, which needs to be addressed for agriculture growth and development. The recurring challenges such as absence of comprehensive land classification, loss of agriculture land for other development, land fragmentations, human wildlife conflicts, increasing numbers of gungtongs, increasing fallow land, huge imports of agricultural products, inadequate agriculture infrastructure, amongst others have resulted in inadequacies in the implementation of the programs and activities of the Ministry. As such, MoAF has not been effective in delivering the 11th FYP target on food production. Further, there is absence of institutional linkages amongst relevant agencies in taking ownership in implementation of FNS policy and other issues related to food security.

The agriculture sector has the potential to increase food security through an effective and appropriate legislative intervention. Finalisation of land policy and its full implementation is expected to deliver in bringing transformation of agriculture sector towards achieving food security and ultimately long term and sustainable economic development. Further intervention and appropriate solutions are desirable on challenges and barriers mentioned above.

Based on the inadequacies observed, the RAA has made 14 recommendations intended to further enhance the efficiency and effectiveness of the Ministry in delivery of its mandate.

APPENDICES

Responses from Ministry of Agriculture and Forests, Thimphu



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ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture & Forests
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Secretary

Comments from MoAF on “Performance Audit Report on Food Self-sufficiency and Security”

Ministry of Agriculture and Forests

Table 1: Specific comments

Topics/Contents	Comments
2.3 Current Food situation	If the reference point should be used as 2012 for both import and export, currently documents used 2007 for export, while 2012 was used for comparing food import .
2.4 RNR Sector growth rate and contribution	Primary sector 17.37%, secondary 40.57 % and Tertiary sector 42.06 (2017). However, for the primary sector, contribution in absolute term shows a increasing trends, therefore, contribution is not negligible or insignificant. Moreover, it will interesting to if an analysis considered the correlation between declined in investment vs. declined GDP share.
Part II: Initiatives and positive development	Some key achievements of the ministry were not captured in the positive development, such irrigation, farm roads, land development, farm mechanization, HWC, area developments initiatives like mega farms, establishment of SOEs and service delivery.
3.1 Inadequacies....	While PAR objectives is on first two dimensions of the FSN, where as analysis encroaches on other dimensions
3.3 Declining share of budget allocation	The budget allocation for RNR sector for the 12 th FYP is 2.6% of the total outlay. Therefore, correlating performance of the ministry with budget allocation may be useful.
3.4 Agriculture land not fully utilized	Reversion of fallow land is an important factor for ensuring domestic food availability. Nonetheless, it is important note that assessment methodology for fallow land for NLCs and MoAF is different. Notwithstanding the discrepancy in data, MOAF has prioritized fallow land rehabilitation in 12 th FYP. Discussions are underway to take land development as flagship program and Land Use Certificate is under implementation. Further, land conversion guidelines under revision.
3.5 Food dependency undermining self-sufficiency in	Bhutan depends on food import for majority of the food commodities. However, it would be more conclusive to have



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ROYAL GOVERNMENT OF BHUTAN

Ministry of Agriculture & Forests

Tashichhodzong, Thimphu: Bhutan



Secretary

longer run	some analysis on the increased import of foods despite increased production and productivity. Therefore, the report may have to consider population growth, per-capita consumption, purchasing power and floating populations, and cost production.
Non-achievement of RNR's 11 th FYP targets	Achievement of production target is calculated as an average of 5 years which is technically incorrect. Target is based on annual progressive increasing trends where production figure for the last production year of the plan period is planned achievement. It would be have interesting for more analysis to understand why certain targets have not been achieved. Report makes strong conclusion on <i>"relaxed commitment"</i> & <i>'waste of resources'</i> (p.22) without substantial evidences.
3.8 lack of subsidy policy	RGoB continue to provide subsidy to enhance production , however, existing subsidies needs to be reviewed and increased. Towards this, proposal was submitted to the MoF with no positive outcome, thus far. Concurrently, MoAF also initiated Cost Sharing Mechanism, instead of draft subsidy policy (2010) which was not forth coming from the MoF. CSM seeks to fully institutionalize the existing subsidies aimed at enhancing the efficiency and transparency (as indicated by RAA report).
3.12 Non maintenance of NFSR	NFSR proposal was approved by the RGoB in July 2018 and is now integrated into 12 th plan (to be implemented by FCBL). However, NFSR requires budget of Nu. 497 million to kick start operationalizing it. GNHCS is yet to allocate fund on this.
3.13 lack of need assessment for farmers training	Technical trainings and capacity building for the farmers are carried out purely on a need basis. Training of farmers becomes imperative in view of emerging farming technologies which needs to be adopted on a continuous basis.
3.14 absence of pricing policy and guideline	Putting in place a Pricing Policy (PP) would essentially mean fixing legal minimum and maximum price for specific commodities to ensure the price remains within the limits through intervention by the government. Any attempt by the government to control prices would go against the



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ROYAL GOVERNMENT OF BHUTAN

Ministry of Agriculture & Forests

Tashichhodzong, Thimphu: Bhutan



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Secretary

	<p>principle of free market economy. The prices favorable to the producers (farmers) would work against the interest of the general consumers and vice-versa.</p> <p>In the long run, price control will inevitably lead to black market, food shortages and rationing, in addition to huge regulatory burden to the government. Considering all these detrimental effects, price control is not an option. Prices are determined by the forces of supply and demand and the only strategy to keep prices reasonable to the general consumers is through competition by encouraging more producers and higher production.</p> <p>However, there is a need for government intervention to protect the investment losses (cost of production) at times of market failure. The current buy back mechanism in place does exactly this, and should be continued till such time the crop insurance system becomes viable and a norm.</p> <p>The farmers have the option of selling their produce themselves or through the intermediaries (middlemen). Middlemen offer a very important marketing service to the farmers, since vast majority of the farmers live far away from the market and do not find it viable to either haul the produce themselves to the market or retail their produce themselves.</p> <p>Therefore, the ministry is not in favour of having a pricing policy or regulating the market.</p>
<p>3.15 Inadequate monitoring and evaluation of Farmers' Cooperatives and Groups</p>	<p>There are over 70 cooperatives and around 450 farmers' groups in the country (just a correction of figures). While the Act specifies the need for a regular M & E, in the initial stages the ministry was more focused on promoting and strengthening farmers groups and cooperatives and monitoring and evaluation of all farmer groups and cooperatives would not be carried as a result of limited resources- both financial and human. Now the cooperatives and farmer groups have matured and the department has been strengthened with the addition of another regional office, M&E will be given priority.</p>



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ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture & Forests
 Tashichhodzong, Thimphu: Bhutan



Secretary

	<p>While the department has regularly reminded the cooperatives to submit their annual financial statements, they have not been able to comply because of inadequate capacity of the cooperatives and farmer groups. Furthermore, the Act is silent on the administering of actions/penalties the department can take for non-compliance except for involuntary dissolution through a court order. The ministry is already in the process of amending the Act which will consider all the lapses in the extant Act.</p> <p>Likewise, despite reminders, probably because the Act is silent on penalties for non-compliance, cooperatives and farmer groups fail to renew on time. The Act does not specify whether farmer groups and cooperatives whose registrations have expired be recognized as a legal entity or not. Furthermore, there is no penalty specified should they seek renewal after the expiry of the registration. The ministry is already in the process of amending the Act which will consider all the lapses in the extant Act.</p> <p>In addition to the amendment of the Act, the ministry is working towards developing an online registration system for Farmer Groups and Cooperatives wherein they can apply for registration and renewal. This online system hopes to improve the information updating, management and monitoring of FGs and Coops.</p>
<p>3.16 Farm Shops not meeting its intended objectives</p>	<p>One of the core functions of the farm shop is to buyback the surplus agricultural produce. The buy-back mechanism was introduced with objective to procure the surplus commodities by the government during market failures or only as a last resort measure to at least recoup their cost of investment. Among other parameters (prevailing market prices, its role in the national food security, popularity in the market etc.), the cost of production is the most important parameter used in the calculation of the buy-back price. In short, the buy-back price is very close to the actual cost of production. The government introduced the buy-</p>



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ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture & Forests
 Tashichhodzong, Thimphu: Bhutan



Secretary

	<p>back system only as a last market option.</p> <p>Therefore, the RAA's observation of having no record of buy back by FCBL, during their field visit to farm shops, would not necessarily mean that the objectives are not met. It would only indicate that open market situation was favorable during the season and does not arise the need to sell through buy-back mechanism.</p>
<p>3.18 (b) Market information system for food prices not updated</p>	<p>The current market information system was developed sometime in 2009 and as pointed out in the report is not able to provide the required services (comprehensive market information services) to the relevant stakeholders to make informed decision (s).</p> <p>Having recognized this shortfall, the department through the support of International Trade Centre (ITC Project) is at the moment upgrading our existing market information system, which once completed and operationalized, to a large extent will be able to address all the shortcoming of the current system. However, with this new system, apart from collecting our own data, the department will have to continue sourcing primary information from other sources such as FCBL (auction data) and DRC (export-import data) to improve the quality of information available (in view of respective sectors mandate). Furthermore, operationalizing the new system will have a human resource implication in the form of data collectors.</p>
<p>3.17 inadequate agriculture infrastructure (irrigation)</p>	<p>Irrigation: MoAF has planned 108 major schemes to be executed, however, due to lack of fund, only 41 schemes was achieved during the 11th FYP.</p> <p>Underutilization of cold storage:</p>
<p>ii) Utilization of storage facilities</p>	<p>Marketing Infrastructure Guidelines which is in place is expected to address these issues to large extent.</p>



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ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture & Forests
Tashichhodzong, Thimphu: Bhutan



Secretary

PPD/PMS/1/1/292

29th January, 2019

To,
The Deputy Auditor General
Department of Performance and Commercial Audits (DPCA)
Royal Audit Authority
Thimphu

Subject: Responses on Draft Performance Audit Report on Food Self-Sufficiency and Security

Dear Sir,

This has reference to you letter vide no RAA/TAD (PA-MoAF)/2018-19/146, dated 22nd January, 2019 with regard to the subject above. In this regard, we are pleased to submit herewith an additional documents (list of documents/links attached) as requested.

Should there be any further clarification, we will be happy to further discuss with the Audit team directly.

With kind regards;

Yours sincerely


Ugyen Penjore
Offtg. Secretary

Copy to:

1. The Chief Planning Officer, PPD, MoAF



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ROYAL GOVERNMENT OF BHUTAN

Ministry of Agriculture & Forests

Tashichhodzong, Thimphu: Bhutan



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Secretary

Comments from MoAF on “Performance Audit Report on Food Self-sufficiency and Security”

Ministry of Agriculture and Forests

Topics/Area	List of supporting documents
1) Some key achievements of the MoAF that were not captured in the audit report (Chapter 3, Part D);	1. Snap shots of the 11 th plan terminal report (<i>to be submitted directly to RAA team through email</i>) 2. Also refer 11 th plan terminal report submitted earlier
2) The source document on RNR Sector growth and contribution of Primary sector (17.37%), Secondary sector (40.57%) and Tertiary sector (42.06%)(Chapter 2, 2.4);	Detail information in the Statistical Yearbook of Bhutan 2018. Please refer to the link below for further information. http://www.nsb.gov.bt/publication/files/SYB_2018.pdf
3) Since the production figure in 2018 was not available, the RAA took the average of 5 years to provide an indication on the performance of the Ministry in achieving food production targets. The Ministry would be in a better position to justify why some targets could not be achieved for validation by RAA (Para 3.7); and	Achievement of production target is calculated as an average of 5 years which is technically incorrect. Target is based on annual progressive increasing trends where production figure for the last production year of the plan period is planned achievement. Therefore, we would like to request Audit performance team to kindly replace average production by last year of the achievement (2017) Please refer following documents: 1. Livestock census 2017 file:///C:/Users/Lenovo/Downloads/Livestock-Statistics_2017_Website_upload-1%20(1).pdf 2. Agriculture Statistics (<i>to be submitted through email to audit team</i>)
4) The budget allocation for RNR sector for the 12 th FYP is 2.6% of the total outlay. Therefore, correlating performance of the ministry with budget allocation may be useful.	Percent share of RNR Sector budget from 1 st FYP to 11 th FYP. (<i>to be submitted through email to audit team</i>)
5) 3.14 absence of pricing policy and guideline.....	Agreed as proposed, however for detail information and for clarity, kindly refer to our earlier comments/suggestion.
6) The actual figure on the fallow land was calculated based on the agriculture land information obtained from NLCS (refer para 3.4 for details)	- On Para 3.14 – The department does not clearly understand the recommendation made by the RAA to institute a pricing system through effective institution of polices and monitoring system to improve market access and provide better quality products at reasonable rates. As submitted earlier, the Ministry



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	<p>institute a pricing system through effective institution of polices and monitoring system to improve market access and provide better quality products at reasonable rates. As submitted earlier, the Ministry does not prescribe to a system where the government has a role in fixing prices of goods and commodities produced by the private sector. The Department of Agricultural Marketing & Co-operatives is in the process of upgrading the market information system (MIA) which will provide the very important service of market information to all stakeholders – including the producers and the consumers.</p> <ul style="list-style-type: none"> - It would be appreciated if the RAA would clarify the recommendations made, in case we have misunderstood it; upon which we may be able to provide further views or adopt the recommendation in entirety.
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ANNEXURE

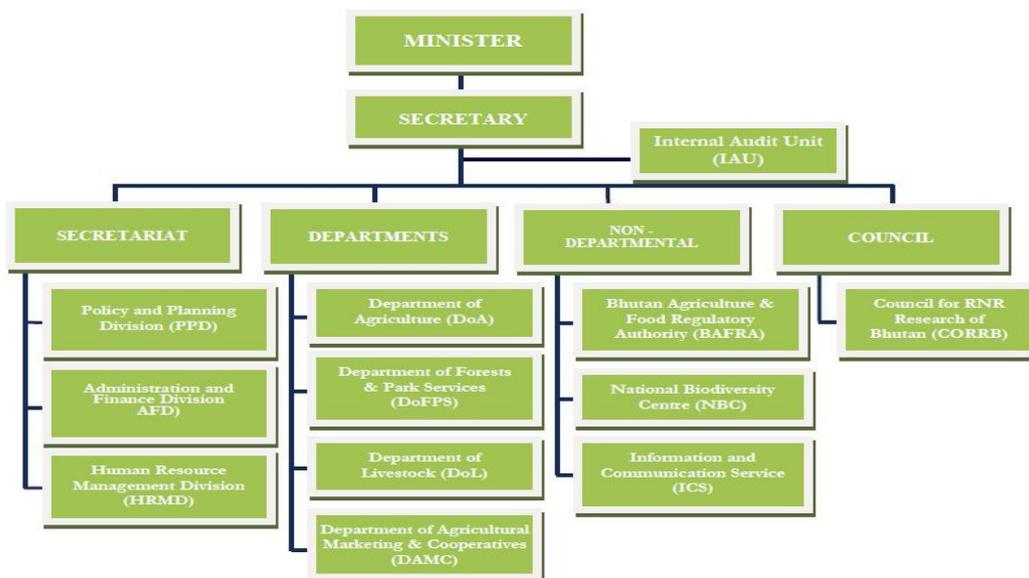
Annexure-I
Legal and Policy Framework governing Agriculture Sector

1	The Constitution of the Kingdom of Bhutan
2	Vision 2020
3	The Plant Quarantine Act of Bhutan
4	Forest and Nature Conservation Act of Bhutan
5	The Seeds Act of Bhutan, 2000
6	The Pesticides Act of Bhutan
7	The Livestock Act of Bhutan, 2001
8	The Biodiversity Act of Bhutan, 2003
9	The Food Act of Bhutan, 2005
10	Land Act of Bhutan, 2007
11	The Cooperatives (Amendment) Act of Bhutan, 2009
12	Bhutan Water Policy, 2003
13	Bio-Security Policy, 2008
14	Economic Development Policy, 2010
15	Foreign Direct Investment Policy, 2010
16	National Forest Policy, 2011
17	National Irrigation Policy, 2012
18	RNR Research Policy, 2012
19	National Food and Nutrition Security Policy of Bhutan
20	Bhutan National Human-Wildlife Conflict Management Strategy, 2008
21	Strategy for Protection of Agricultural Areas, December 2009
22	RNR Marketing Policy, 2018
23	Timber Pricing and Marketing Policy (Draft)
24	National Land Policy, (Draft)
25	Food Safety Policy (Draft)
26	Agriculture Subsidy Policy (Draft).

Annexure-II
Organisation Structure of MoAF

The MoAF also called the Renewable Natural Resource (RNR) Sector is headed by a Minister who is supported by a Secretary. The secretariat of the Ministry supported by the Policy and Planning Division (PPD), Human Resource Division (HRD) and the Administration and Finance Division (AFD) discharge policy analysis, planning, HR Development/Management, financial and administrative functions. The Department of Agriculture (DoA), Department of Livestock (DoL), and Department of Forests and Park Services (DoFPS) discharge technical functions. Specialized cross-sectoral supports and services are provided by Department of Agricultural Marketing and Cooperatives (DAMC), National Biodiversity Centre (NBC), Bhutan Agriculture and Food Regulatory Authority (BAFRA), and Information and Communication Services (ICS) as shown in the **Figure 2.1**.

Figure 2.1: Organization Structure of MoAF



Source: RNR Sector Eleventh Plan (2013-2018)

Non-departmental organizations provide support to the technical departments in terms of communication and information services, law enforcement, and ex-situ agro-biodiversity and animal biodiversity conservation services.

Annexure III

Food commodity produced during 2012-2017

Crops/ Produce	2012		2013		2014		2015		2016		2017	
	Quantity produced (MT)	Yield (Kg/ Acre)										
Barley	2356	720	2,009	701	1,753	716	1,800	714	1,702	694	2005	586
Buckwheat	4303	628	3,641	553	2,583	543	3,234	628	3,705	537	3480	598
Maize	73024	1150	75,715	1,298	77,244	1,311	83,714	1474	82,035	1449	94052	1424
Millet	3965	614	2,951	584	2,362	554	1,811	539	1,714	528	1739	480
Paddy	78014	1493	75,228	1,556	77,038	1,576	80,261	1,627	85,090	1604	86385	1682
Wheat	5038	909	4,286	788	3,465	706	3,730	770	2,521	678	3833	729
Asparagus	149	454	283	589	205	745	200	477	239	574	79	392
Beans	2479	874	2,636	812	2,830	1184	3,612	1200	4,409	1302	5273	1410
Broccoli	363	915	814	962	1,010	1154	831	1334	1,004	1385	1371	1298
Cabbage	3413	1275	3,961	1,632	4,364	2316	5,209	2309	6,685	2442	10562	2974
Carrot	585	1389	755	1133	746	1679	1,094	1955	1,276	2103	787	1487
Cauliflower	829	1126	922	1067	1,650	1594	1,586	1541	2,082	1377	3575	2229
Chilli	7726	991	8,321	1,609	8,586	1980	7,073	1691	9,907	1789	13606	1797
Cultivated mushroom	4		19		17		19		82		122	
Egg Plant	374	1110	362	633	485	669	694	1510	585	1433	643	857
Green Leaves	2414	1122	2,063	1000	1,938	969	2,871	1114	1,937	1328	4153	1189
Lady Finger	13	469	31	327	28	321	53	834	42	964	26	568
Peas	779	952	1,180	959	970	1362	1,218	1240	1,014	1275	859	856
Potato	43000	3427			53,612	4,194	49,359	4111	58,820	4018	57223	4462
Radish	5245	1862	4,534	1546	5,021	2015	5,840	2077	6,490	2261	6307	1785
Tomato	337	1150	632	1149	899	1570	627	1422	455	1310	383	1198
Turnip	7994	4711	9,757	6028	9,967	5991	10,423	5661	10,499	6551	13051	7236
Onion			420	539							489	824
Garlic			752	431	846	660	899	712	1,176	835	708	491
Cucumber			2,378		2,484		1,697		1,194		1948	
Pumpkin			3,935		4,081		3746		3,671		3171	
Squash			2,366		2,118		2609		2,626		1755	
Gourds			160		270		341		125		278	
Tree Tomato					424		341		275			
Onion bulb					757	949	608	1121	414	935		
Dally Chilli							100		112			
Amarantha											3	66
Quinoa											9	132

Annexure IV
Agriculture land holdings and types

Dzongkhag	Wet land		Dry land		Orchard	
	No.of Plots	Area(Ac)	No.of Plots	Area(Ac)	No.of Plots	Area(Ac)
Gasa	642.00	302.17	2,711.00	926.99	-	-
Paro	17,244.00	3,912.68	23,554.00	11,723.69	890.00	657.84
Samtse	12,905.00	9,394.53	36,208.00	27,498.14	7,388.00	4,988.19
Sarpang	7,504.00	6,190.57	20,687.00	16,098.66	3,778.00	5,152.10
Tsirang	5,786.00	5,137.37	12,323.00	12,379.64	2,904.00	2,022.55
Bumthang	4.00	0.98	16,432.00	15,161.88	99.00	110.64
Chhukha	4,171.00	2,753.65	20,586.00	23,494.85	3,109.00	2,787.86
Dagana	6,349.00	5,525.63	14,323.00	18,165.52	2,088.00	1,946.13
Haa	310.00	222.19	10,647.00	5,762.14	426.00	482.21
Lhuntse	6,809.00	3,607.72	15,123.00	11,366.32	3.00	1.90
Monggar	5,420.00	2,140.71	28,287.00	30,161.89	60.00	26.06
PemaGatshel	1,041.00	611.28	29,171.00	33,846.55	3,115.00	2,659.84
Punakha	16,895.00	8,830.87	6,887.00	3,841.22	90.00	98.20
Samdrupjongkhar	3,333.00	2,678.74	29,757.00	30,151.67	1,389.00	637.66
Thimphu	2,489.00	781.49	6,050.00	5,095.91	490.00	659.53
Trashigang	15,278.00	5,027.57	52,585.00	39,092.91	19.00	44.81
Trongsa	4,806.00	2,958.67	11,674.00	7,794.87	89.00	121.41
Wangduephodrang	13,272.00	7,197.20	13,899.00	6,681.83	80.00	58.28
Trashiyangtse	8,403.00	3,575.42	23,604.00	15,645.05	4.00	3.64
Zhemgang	4,589.00	2,773.88	19,199.00	21,678.19	407.00	356.55
TOTAL	137,250.00	73,623.33	393,707.00	336,567.88	26,428.00	22,815.39

Source: NLCS

Annexure-V
Land conversion cases from 1998 to 2018

SN	Dzongkhag	Recommended								
		1998-2011	2012	2013	2014	2015	2016	2017	2018	Total
1	Chukha	7.94	0	0.18	0	0.71	1.907		1.364	12.101
2	Dagana	35.84	2.96	0.15	13.408	1.324	23.97	7.644		85.296
3	Gasa	0.25	0	0	0	0.78	0			1.03
4	Lhuntse	2.05	1.53	0.357	0	0	0			3.937
5	Mongar	2	0	2.68	0.979	0	0	0.13		5.789
6	Pemagatshel	7.8	0	0	0	0	0	2.34		10.14
7	Paro	48.61	1.16	0.16	0.14	0	12.09	0.48	6.628	69.268
8	Punakha	81.9	4.2	5.66	0	27.04	3.48	4.416	35.82	162.52
9	Samtse	25.93	0.69	1.25	5.36	12.78	0.8		5.591	52.401
10	Samdrupjongkhar	1.88	0.7	0.8	0	0	0			3.38
11	Sarpang	57.27	11.53	1.06	3.53	0	0			73.39
12	Thimphu	65.35	7.4	4.64	0.61	0	0.77	0.35	2.947	82.067
13	Trashigang	22.83	0.7	8.47	0	0	0	1.691		33.691
14	Trashiyangtse	7.4	1.7	2.36	0	0	0	3.388		14.848
15	Tsirang	34.91	2.51	4.75	0	0.5	0	1.04		43.71
16	Trongsa	0	0	0.37	2.951	3.132	0	0.5		6.953
17	Wangdue	34.94	1.62	2.93	0	6.989	0	1.095	4.859	52.433
Total Area (acres)										712.95
SN	Dzongkhag	Not recommended								
			2012	2013	2014	2015	2016	2017	2018	Total
1	Chukha	1.19	0.5	1.5	0	0	0			3.19
2	Dagana	24.79	16.85	0	45.32	0	37.99	29.162		154.11
3	Gasa	1.61	0	0	0	0	0			1.61
4	Lhuntse	0.3	0	0	0	0	0			0.3
5	Mongar	0	0	1.245	0.849	0	0			2.094
6	Pemagatshel	0.47	0	0	0	0	0			0.47
7	Paro	68.07	1.11	0.92	0	0	3.224	0.296	7.272	80.892
8	Punakha	82.058	12.68	10.479	0	11.013	0	7.902	12.65	136.78
9	Samtse	47.89	26.34	12.08	0	0	0		2.415	88.725
10	Samdrupjongkhar	0	0.8	0	0	0	0			0.8
11	Sarpang	192.03	12.87	17.51	0	0	0			222.41
12	Thimphu	46.993	11.15	5.58	0	0	0.56		1.994	66.277
13	Trashigang	3.79	0	0	0	0	0			3.79
14	Trashiyangtse	1.32	0	0	0	0	0			1.32
15	Tsirang	132.23	7.04	17.01	0	0	0	8.75		165.03
16	Trongsa	0	0	0	0	0	0	0.638		0.638
17	Wangdue	17.83	6.26	1.08	0	1.035	0	25.668	2.199	54.072
Total Area (Acres)										982.51

Annexure VI
Agricultural Subsidies available under Ministry of agriculture and forestry as of July 2018

Commodity/Components	Proportion	Approving-Governance Authority
Seeds & Seedlings (NSC) :PRODUCTION	10 % of Expenditure	DoA, NSC
Seeds & Seedlings (NSC) :TRANSPORTATION	Actual, Nu.14 M	DoA, NSC
Seeds & Seedlings : PROMOTION	Free/cost sharing	Dzongkhag, LG
Butachlor (NPPC) : TRANSPORT	Actual cost ,0.593 m	DoA, NPPC
FMCL- Hiring and Transport	20 m annually, Average proportion of subsidy= 56.1 %	DoA, FMCL
Electric fencing	40%	NPPC, Dzongkhag
Pre-fabricated green house, low poly house	Pre-Fabricated: Groups-80 %. Individual-60 % and Low -cost	DoA, Dzongkhag
Post-harvest structures and equipment	50 % (NPHC), 100 % (DAMC)	NPHC
Drip & Sprinkler irrigation, storage, reservoirs	100 % on purchase price and free transport until road point	DoA,Dzo
Compost structures	Structure= Nu.15,000 or 60 %	DoA
Machineries and equipment	Free transport and installation	FMCL
Marketing	Free transport	DoA
Land Development	CMU machies- fuel basis	Dzo
Mushroom	Free spawn for small scale, equipments on returnable basis	NMC

Source : Department of Agriculture, MoAF

Annexure VII**Compensation paid for Livestock Depredation by Wildlife till 2014**

Year	Amount	Remarks
2002	16,500.00	Compensated for all predators
2003	639,000.00	
2004	2,808,450.00	
2005	2,362,450.00	
2006	266,750.00	
2007	145,000.00	Compensation for Tiger and Snow Leopard only
2008	101,000.00	
2009	25,500.00	
2010	147,500.00	
2011	379,500.00	
2012	675,550.00	
2013-2014	587,750.00	
Total amount paid	8,154,950.00	



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