Assessment of Existing Institutional Capacity of the RNR Sector and its related Agencies to Plan and Implement Climate Resilient Integrated Landscape Management and Community Development

Policy and Planning Division
The Ministry of Agriculture and Forests
October 2018

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ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture and Forests
Thimphu : Bhutan

Foreword

This report is a result of implementation of a project titled, "Enhancing Sustainability and Climate Resilience of Forest and Agricultural Landscapes and Community Livelihoods in Bhutan." The project is mandated to promote climate-resilient integrated landscape management within the Renewable Natural Resource (RNR) Sector. Hence, this report presents capacity and institutional gaps and lends ideas to fill the gaps to promote climate-resilient integrated landscape management.

The climate-resilient integrated landscape management holds great potential for sustainable development. It not only requires landscape resource users to integrate their development plans; it also requires them to turn their development climate smart. Climate-resilient integrated landscape management involves managing composite functions of a landscape ranging from agriculture, forestry, livestock development, watershed management and mining to bio-diversity conservation, besides climate mitigation and adaptation. So, common objective of work on climate-resilient integrated landscape management is to make the composite functions of a landscape sustainable as well as climate smart through technical and institutional capacity strengthening interventions.

This report creditably identifies technical capacity gaps in the RNR Sector for promoting integrated landscape management and climate change mitigation and adaptation. To that effect, it presents an invaluable knowledge on integrated landscape management and climate change mitigation for technical capacity building along with a technical capacity development plan. Similarly, it also identifies institutional gaps and provides an in depth knowledge for institutional strengthening along with an institutional development plan to promote climate-resilient integrated landscape management.

The climate-resilient integrated landscape management is complex and challenging due to the composite functions of a landscape. Strengthening technical and institutional capacities are inevitable. However, results would accrue only after the putting the management to practice once the technical and institutional capacities.

Kencho Thinley
Chief Planning Officer

ACKNOWLEDGEMENT

TABLE OF CONTENTS

ABBREVIATIONS

AKRAs	Agency Key Results Areas
ARDC	Agricultural Research and Development Center
CFO	Chief Forestry Officer
CIAT	International Center for Tropical Agriculture
CNR	College of Natural Resource
DAO	District Agricultural Officer
DLO	District Livestock Officer
DoFPS	Department of Forests and Park Services
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
FNCA	Forest and Nature Conservation Act
GEF	Global Environment Facility
GNHC	Gross National Happiness Commission
ILM	Integrated landscape management
IPCC	Intergovernmental Panel of Climate Change
JKSNR	Jigme Khesar Strict Nature Reserve
LDCF	Least Developed Countries Fund
LDPM	Local Development Planning Manual
LGKRAs	Local Government Key Result Areas
MoAF	Ministry of Agriculture and Forests
NCHM	National Center for Hydrology and Meteorology
NEC	National Environment Commission
NKRAs	National Key Result Areas
NOP	National Organic Program
NRDCL	Natural Resource Development Corporations Ltd.
PD	Program Director
PPD	Policy and Planning Division
PRA	Participatory Rural Appraisal
RDTC	Rural Development Training Center
RLDC	Regional Livestock Development Center
RNR	Renewable Natural Resources
RRA	Rapid Rural Assessments

SAPA	Sector Adaptation Plan of Action
SAS	Self-Assessment Surveys
SDG	Sustainable Development Goal
SLMP	Sustainable Land Management Program
SWOT	Strength, Weakness, Opportunity, Threat
ToT	Training of Trainers
UNEP	United Nations Environment Program
UWICER	Ugyen Wangchuk Institute for Conservation & Environment Research
WWF	World Wildlife Fund

1   EXECUTIVE SUMMARY

The Ministry of Agriculture and Forests is implementing a GEF-LDCF-funded project titled, "Enhancing Sustainability and climate Resilience of Forest and Agricultural Landscapes and Community Livelihoods in Bhutan". In keeping with a project objective, a review was conducted to assess institutional and technical capacity gaps in the Renewable Natural Resource (RNR) Sector for climate-resilient integrated landscape management and community development.

The assessment was carried out through Literature Review, Focus Group Discussions (FGDs) and Self-Assessment Surveys (SAS). FGDs and SAS were designed and applied to seek inputs from the discussants and respondents to determine the capacity gaps for climate-resilient integrated landscape management and community development.

Officials representing the Departments of Forests and Park Services, Agriculture and Livestock; agriculture and livestock sectors of Haa Dzongkhag; the Jigme Khesar Strict Nature Reserve; Agricultural Research and Development Center (ARDC), Bajo and Ugyen Wangchuck Institute for Conservation and Environment Research (UWICER), Yusipang took part in FGDs. The District Agricultural Officers, District Livestock Officers, and Chief Forestry Officers of the project area and the Program Directors of the ARDC and UWICER were the SAS respondents.

The term integrated landscape management (ILM) was adopted by the Global Landscape Forum in 2012. Putting the ILM concept into practice involves (a) understanding the ILM concept; (b) establishing a multi-stakeholder platform; (c) stakeholders agreeing on a shared understanding of landscape multiple objectives; and (d) collaborative planning, implementation, monitoring and adaptive management. The RNR Sector requires to strengthen technical capacity for (a) establishing a multi-stakeholder platform; (b) getting stakeholders to agree on shared understanding of landscape multiple objectives; and (c) collaborative planning, implementation, monitoring and adaptive management. It also requires to strengthen institutional capacity by (a) adopting and integrating ILM into RNR sector policies; (b) strengthening forest policy implementation; (c) revising existing forest regulation and rules; (d) revising the forest management code; (e) revising planning frameworks of forestry, agriculture and livestock sectors; and (f) institutionalizing ILM mainstreaming.

Strengthening climate-resilience across the RNR Sector would need building technical capacity for (a) discerning climate change impact to the Sector; and (b) improving meteorological data collection, vulnerability assessment, and customization and dissemination of climate-smart technologies. To make the Sector more climate resilient, institutions need strengthening by (a) adopting new climate change policy for agriculture and livestock sectors; (b) improving the implementation of the forest policy; (c) integrating climate change into the planning frameworks of forest, agriculture and livestock sectors; (d) raising awareness about climate change impacts; (e) setting up meteorological data collection system for the Sector; and (f) integrating climate change into research and extension programs.

2   INTRODUCTION

The Ministry of Agriculture and Forests (MoAF) is implementing a GEF-LDCF funded Project supported by UNDP titled 'Enhancing Sustainability and Climate Resilience of Forest and Agricultural Landscape and Community Livelihoods.' The primary objective of the project is to operationalize an integrated landscape approach through strengthening of biological corridors, sustainable forest and agricultural systems, and building climate resilience of community livelihoods.

The project seeks to address (a) the adverse impacts of climate change on rural livelihood security (SDG 13), (b) poverty (SDG 1), and (c) the effects of sector-led development practices on the ecological integrity of biodiversity-rich forested landscapes (SDG 15).

This project will demonstrate how climate change adaptation and biodiversity conservation as well sustainable forest management objectives can jointly be addressed and create synergistic impact for sustainable development.

The project is required to produce three key outcomes. One of the outcomes is "Enhanced institutional capacity for integrated landscape management (ILM) and climate change resilience." Under this outcome a study has been commissioned to determine technical and institutional capacity strengthening required for ILM and climate change resilience across the RNR Sector.

3   METHODOLOGIES

The study is comprised of two parts. The first part constituted reviewing of ILM concepts and discernment of institutional and technical capacities required to put the concept into practice. The second part of the study constituted reviewing of climate change impacts on the forest and agriculture landscapes and suggesting a technical and institutional capacity building program to mitigate and adapt to climate change impacts. Considering the nature of the two parts of the study, literature review, focus group discussions (FGDs) and SAS (SAS) were deemed as appropriate methods.

3.1   Literature Review

An in-depth reviews of scientific papers, policy documents, planning frameworks, strategic documents, action plans, project documents, management plans, and project field notes were carried out. Generally, the discussions centered on ILM concepts, setting up ILM implementation arrangement, institutional and technical capacities needed for ILM implementation and climate change mitigation and adaptation.

3.2 Focus Group Discussions

The FGDs were grouped into three areas: (i) ILM concept and climate change impact; (ii) existing policies, legislations, institutions, planning frameworks and their suitability for ILM implementation and climate change mitigation and adaptation; and (iii) assessment of institutional and technical capacities needed for ILM implementation and climate change mitigation and adaptation.

The FGDs adopted a bottom-up approach- from local, regional and departmental to central levels. The FGDs participants were diverse professionals - decision makers, planners, subject experts, and field implementers.

A total of eight FGDs were conducted. At the central level, one FGD was conducted with the Policy and Planning Division (PPD) of the Ministry of Agriculture and Forests and the Gross National Happiness Commission. Three FGDs were held, one each, with the Departments of Agriculture, Livestock and Forests and Park Services. At the regional level, the Agricultural Research and Development Center (ARDC), Bajo and the Ugyen Wangchuck Institute for Conservation and Environment Research (UWICER), Yusipang took part in the FGDs. At the Dzongkhag level, FGDs were conducted with the Agricultural and Livestock Sectors of Haa and the officials of the Jigme Khesar Strict Nature Reserve (JKSNR), Haa.

3.3 Self-Assessment Surveys

The SAS were administered via emails to determine the institutional and technical capacities in ILM and climate change impacts. The surveys covered 12 Dzongkhag Agricultural Officers (DAOs), 12 Dzongkhag Livestock Officers (DLOs), nine Chief Forestry Officers (CFOs) and two Program Directors (PDs) of the ARDCs, all from the project areas. The respondents were chosen with purposive sampling. Being involved in the project, these officials were assumed to have certain level of knowledge on ILM concept.

4   RESULTS OF THE REVIEWS, DISCUSSIONS AND SURVEYS

This section reports findings of the assessments in four categories: an ILM concept and approaches; climate change risks and vulnerability assessments; institutional and technical capacity building for ILM; and institutional and technical capacity building for climate change mitigation and adaptation.

4.1 ILM- Concept and Approaches

The literatures on this topic generally begin to convey the meaning of the term 'landscape' first and then go on to explain the term ILM. Generally, a landscape is understood as a socio-ecological system consisting of a mix of natural ecosystems, human-altered and

used ecosystems and human settlements. Thus the characteristics (landforms, land uses ecosystems and human habitats) of a landscape is shaped by the ecological, historical, economic and cultural processes (Scherr et al., 2013). A landscape as a social system constitutes norms and modalities that humans employ to manage ecological system for their economic, social and environmental benefits. A landscape may measure hundreds to thousands of square kilometers with distinct or indistinct boundaries depending on the management objectives (Scherr et al., 2013). Landscape boundaries may be consistent with watershed boundaries and distinct land features, and may or may not be consistent with jurisdictional boundaries.

Generally, landscapes are used for multi-functions. In other words, landscapes are used for multiple objectives – agricultural production, biodiversity conservation, local livelihoods, human health and wellbeing, landscape beauty, and recreational value (EcoAgriculrure, 2013). In Bhutan, the RNR Sector uses landscapes for biodiversity conservation, biological corridors, protected areas and agricultural, forest and livestock production.

It is important to note the distinction between the term 'traditional landscape management' and 'integrated landscape management (ILM)'. The traditional landscape management involves many sectors employing sectoral approaches independently to pursue their sector-specific objectives in a landscape independently. The sectoral approaches have two inherent weaknesses in managing the multi-functionality of landscapes: (i) limitation in reconciling trade-offs and promoting synergy among different stakeholders, and (ii) balancing conservation and production functions (Scherr et al., 2013). Often driven by competing sectoral policies and lack of coordination among stakeholders, traditional landscape management leads to competing use of landscape resources and constitutes a threat to human wellbeing, security and sustainable economic growth (UNEP, 2015). In other words, to cite some examples, those concerned with agriculture, both famers and policy makers, focus on maximizing agriculture productivity. Likewise, forestry stakeholders are concerned with maximizing the timber and non-timber production. It may well be that in both these cases, conservation and development override each other.

With progress and over time, many traditional sector-focused landscape practitioners built their concepts, put to practice on the ground and gained experience. As a result, terms such as integrated management of territory, integrated natural resource management, integrated rural development, integrated watershed management, organic agriculture, sustainable agriculture land management, multifunctional agro-ecological landscape, biological corridor, and ecosystems approach to agriculture, forest management for food security, green infrastructure, and systems approach to rural development came to use (Scherr et al., 2013). It dawned on landscape practitioners that landscape actors and action strategies needed to converge on the ground and, thus, recognize and manage the value of multi-functionality of a landscape. As those terms connoted approaches converging around what was increasingly

alluded to as 'integrated landscape management' the term was adopted in 2012 by the Global Landscape Forum.

The following conditions, also termed as ILM elements, must be fulfilled to practice the concept of ILM:

- A multi-stakeholder platform is instituted and inclusive, participatory, collaborative decision-making is functional (Scherr et al., 2013; WWF, 2016);
- Stakeholders discuss and build a shared agreement of multiple landscape objectives (Thaxton et al., 2017; Scherr et al., 2013);
- Stakeholders do collaborative planning (WWF, 2016);
- Effective collaborative implementation arrangement is instituted and operationalized (WWF, 2016);
- Monitoring, adaptive management and accountability compliance system is functional (WWF, 2016).

Enabling governance, finance and market are recognized as catalysts for ILM operationalization. In other words, governance that ensures equity, fairness, transparency, accountability, effectiveness and efficiency among the stakeholders lend impetus to ILM operationalization. Similarly, assured financing through public, donor or private sector funding is critical for making ILM work. Market for landscape goods and services also enables ILM operationalization.

According to FAO (2017) employing the integrated approaches at the landscape level requires: (i) providing an extensive platform with broad scope across sectors and domains; (ii) addressing all the cross-sectoral issues at appropriate scales; and (iii) improving the likelihood of success and, thus, sustaining the outcome of the integrated initiatives (p.03). The integrated approaches need to consider situations, needs and objectives of multiple to optimize land use and management practices to contribute to local, district and national goals (p.11). It, however, recognizes that integrated landscape approach is knowledge-intensive and long-term process requiring best practices for agriculture, livestock, forestry, fisheries and aquaculture (p. 06).

As mentioned above, fulfilling the four conditions is inevitable to put ILM concept to practice. Therefore, the ideas and steps to be taken to put to ILM concept to practice are described in the ensuing section as follows:

(a)   Multi-stakeholder Platform

Landscapes serve different functions and interests, including the interests of distant stakeholders. So, ILM involves Stakeholder Analysis to identify stakeholders and their interests (WWF, 2016). It is also necessary to understand who wields power the most. Similarly, it is

important to know disadvantaged groups, gender implications, culture, religion, races, access and resource tenure, etc. Power Mapping is therefore done to determine power relations among stakeholders and Institutional Mapping is done to learn about policies and statutes that govern landscapes.

The interests of different stakeholders and conservation and economic functions of landscapes may be conflicting. Different landscape objectives, for example forestry and grazing may be competing. Such conflicts and competitions need to be reconciled. Besides, stakeholders need to discuss, design, manage and monitor landscape actions through a collaborative processes. Therefore, a multi-stakeholder platform needs to be established to ensure genuine participation of stakeholders rather than a mere 'token level participation' (Milder et al., 2014:69) or 'one of the consultation' (Denier, L. et al., 2015, p. 63).

(b)   Building a Shared Understanding of Landscape Multiple Objectives

Landscapes have diverse functions and serve the interests of diverse stakeholders – farmers, government agencies, businesses, civil society, etc. (Scherr et al., 2013). Therefore, stakeholders - based on their aspirations, knowledge and experience – need to negotiate and reconcile their differences and agree on a shared understanding of landscape multiple objectives. To forge a shared understanding of the landscape objectives, natural and social capital needs to be assessed and long term trends and root causes of problems identified (WWF, 2016). For this purpose, landscape boundary setting, spatial mapping of ecosystem services, environmental and socio-economic assessment, supply and value chain analysis and priority setting form necessary tasks.

There are numerous tools for assessing natural and social capitals, mapping and priority setting. For example, GIS and participatory mapping are used for boundary setting, InVest, Natural Capital, TESSA, PA-BAT, Footprints are used for spatial ecosystem services mapping. Priority settings are carried using tools such as Key Biodiversity Areas and Population and Habitat Viability Analysis (for conservation). The long term trends and root cause of problems are assessed through (i) trend and driver analysis; (ii) vulnerability analysis; and (iii) land use and land use change analysis etc. (WWF, 2016).

(c)   Collaborative Planning

Once the shared understanding of landscape multiple objectives is agreed, stakeholders need to formulate management plans collaboratively taking into account the interconnectedness of biophysical and social environment and the objectives of varied stakeholders. It is imperative that an ILM plan ensure that all actors agree with common vision, goals and objectives and balance of stakeholders' interests. In the process, debates can flare up, negotiations can prolong, and stakeholders can refuse to reconcile trade-offs. Under such circumstances, facilitation is necessary to balancing interests of different stakeholders, reconciling tradeoffs

and preparing feasible and manageable plan (Denier, L. et al., 2015, p. 80).

Guided by the landscape multiple objectives and based on the information on natural and social capitals, long term trends and root causes of problems, landscape boundary setting, spatial mapping of ecosystem services, environmental and socio-economic assessment, supply and value chain analysis and priority setting, an ILM plan is prepared, shared and finalized. The plan needs to incorporate results chains and log-frames with detailed activity descriptions against the available budgets including the activities to mitigate risks.

(d)   Effective Collaborative Implementation

Usually, most ILM initiatives are long term without immediate tangible results. The implementers face the challenge of enduring the attention of stakeholders and deepening their collaboration. Therefore, to gain the confidence of stakeholders, implementation must be geared towards generating short-term results (QuickWins), conduct regular stakeholder meetings, and disseminate activity progress through effective communication. Implementers also need to ensure effective and efficient implementation of ILM plans.

(e)   Monitoring, Adaptive Management and Accountability

Monitoring the progress and outcomes of ILM initiatives must be guided by the results chain and log-frames to deal with inherent dynamics in landscapes (Sayer et al., 2013; 2015; Ros-Tonen et al., 2018; p. 9). At the present stage of development of ILM, the methodologies to assess and monitor ILM initiatives are not yet developed fully. So, Eco-Agriculture Partners advocate the need to (i) determine objectives and indicators for monitoring; (ii) design and establish appropriate monitoring system, and (iii) interpret, synthesize and share the findings (p. 96). On the other hand, WWF (2016) considers instituting (a) impact indicators and baseline information system, and (b) learning, communication and adaptive management as important (p. 09).

(f)   Catalysts for ILM

Effective governance, enabling market and financial conditions catalyze ILM operationalization. How each one would catalyze ILM is described below.

Governance Catalyst

ILM involves diverse-interest, cross-sector and cross-scale stakeholders. Therefore, governance that ensures equity, fairness, transparency, accountability, effectiveness and efficiency among the stakeholders is critical for the success of ILM initiatives. Effective ILM governance, thus, requires establishing enabling framework for public participation, vertical and horizontal coordination among cross-sector and cross-scale agencies and stakeholders,

clarifying tenure rights and benefit sharing.

Finance Catalyst

Finance is critical component to catalyze implementation of ILM initiatives. Experiences show that raising funds from both public and private sources are slow and, thus, special effort is required to mobilize funds. Mobilization of private funds is slow due to inherent risk and slow return on investment. To mobilize funds for ILM initiatives, governments can provide support or redirect supports to sectors which promotes ILM initiatives, encourage joint investments, screen and fast-track lending and investments processes of financial institutions, reform fiscal policies that support landscape strategies and activate the power and influence of actors at each value chain nodes.

Market Catalyst

ILM can produce a wide range of products and services with monetary values, which are currently not properly monetized and leveraged. For this, there is a need to increase the commitments of corporate players to embed environmental and social impacts in their investments, operations and supply chain; introduce eco-certification and labeling to enable producers demonstrate and promote sustainable production systems; reward those who maintain ecosystem's ability to provide services; for example, watershed protection with payment for ecosystem services, catalyze markets to diversify production in the landscapes, ecotourism services and support good governance in the supply chain to reduce risks (Denier, L. et al., 2015; WWF, 2016).

4.2 Climate Change

This section reports temperature rise projections, changes in rainfall patterns, snow cover, snowfall and frost and summarizes the impacts of these factors on the renewable natural resources sector of Bhutan.

(a) Temperature Increase Projections

The International Center for Tropical Agriculture [CIAT] (2017) projects that annual mean temperature in Bhutan increase by 1.40C by 2030, 2.00C by 2050 and 2.20C by 2070. Tsering et al. (2010) analyzed surface air temperature data of Bhutan for the period 1985 to 2002 and concluded a non-monsoon season warming trend of about 0.5°C. The same authors project that the surface air temperatures will gradually decrease from the west towards the east; surface warming will be more pronounced during the pre-monsoon than the monsoon season; and the inner valleys will experience higher temperature increase than in the northern and southern parts of the country. The summer mean temperature and winter mean temperature show steady increase (NEC, 2011). The Renewable Natural Resources Sector Adaptation Plan

of Action (RNR SAPA)(2016) states that simulations of both HadCM3Q0 and ECHAM5 models show air temperature increase of 3.50C by 2069.

(b)   Change in Rainfall

CIAT (2017) projects average increase in precipitation of 3.8% by 2030, 7.4% by 2050 and 9.8% by 2070. The models – ECHAM5 and HadCM3Q0 – show increase of 600 mm and 500 mm respectively for the period 1980 to 2069 (RNR SAPA, 2016). The north-east and south-west parts of Bhutan are likely to experience 20-30% decrease in winter precipitation by 2050 (Tsering et al. 2010). Climate models predict progressive and steady increase in monsoon precipitation (NEC, 2011). The rainfall fluctuations will be random with no systematic change detectable on either annual or monthly scale which is in coherence with recent analysis of rainfall data from 2000 to 2009 across four eco-floristic zones of Bhutan showing annual fluctuations within regions without any detectable trend (Tsering, 2003).

(c)   Snow Cover, Snowfall Pattern and Frost

Analysis of snow covers from Landsat MSS images taken from 1973 to 1979 and Landsat ETM+ images from 1999 to 2000 indicates a decrease in snow cover in the eastern Himalayas by 24.6 percent (Chettri et al, 2010). While Bhutan lacks systematic record of data and observation on snow cover and snowfall, residents of snowfall areas experience changes in the frequency and pattern of snowfall (RNR SAPA, 2016). An analysis of data for Lunana estimated retreat rates for Debris cover glacier and Debris free glaciers at 35m/year and 9m/year respectively between 2003 and 2008 (NEC, 2011).

(d)   Climate Risks and Vulnerabilities

The RNR Sector has identified (i) agriculture and food security, (ii) water resources and (iii) forests and biodiversity as most vulnerable areas to climate change impact (RNR SAPA, 2016).

Agriculture and food security stands to face increased risk of crop failures due to extreme and unseasonal climate events. Climate change is likely to exacerbate biotic and abiotic stresses and accelerate the loss of production crops and animals. Similarly, soil fertility loss is likely to be accelerated because of increase in the magnitude and incidence of soil erosion, flash floods and landslides, increased rate of soil organic decomposition and increased seepage loss. Increased incidence of natural disaster is likely to have negative impact on infrastructure that support agriculture and livestock development and affect access to production inputs and food. Crop and livestock productions are likely to be affected negatively by decrease in water availability.

Changes in rainfall pattern and temperature are likely to lead to reduction in crop yields and livestock production. Increased incidence of pest and diseases is likely to impact crop and

livestock species negatively and lead to reduction in agriculture and livestock productivity. Freak and unseasonal extreme weather events and natural disasters are likely to incur crop and livestock loss. Warming and change in rainfall patterns are likely to reduce availability of fodder and rangeland resources.

Water resources quality is likely to be degraded by sediments caused by increased soil erosion and landslides. The quantity of water resources is likely to decrease because of drying up of streams and reduction in glaciers. Irrigation is likely to be impacted negatively by increased sedimentation of rivers and clogging of water reservoirs and distribution channels entailing reduction in agricultural production. Soil erosion in water catchments is likely to increase which, combined with increased forest fire incidence, is likely to accelerate the reduction of water retention capacity of water catchments. The effect of water related natural disasters on agriculture are likely to grow.

Forests and biodiversity are vulnerable to forest fires, which could be triggered by combined effect of drought and lightning. The incidence of forest dieback, pest incidence, disease outbreak and wind throw is likely to increase. The wild animals are likely to face the risk of feed resources scarcity and many migratory species are likely to change their migratory pattern. Climate warming is likely to lead to increased vector-borne disease in wildlife. The risk of losing endemic species is expected to grow. Many plants are likely to undergo change in their phenology. Warming is likely to cause altitudinal shift of vegetation that would likely displace some endemic flora and fauna. The forests face an increased risk of invasive species.

4.3   ILM-related Capacity Gaps and Recommendations

This section reports technical and institutional capacity gaps the RNR Sector and its agencies in promoting the ILM concept. A set of recommendations for each category is provided in this section.

4.3.1 Technical Capacity

(a)   ILM concept

FGDs and SASs found very low levels of knowledge (understanding from a theoretical perspective) and skills (applying the theoretical knowledge in real life). Most respondents appeared to take the ILM as synonyms to watershed management, sustainable land management and organic agriculture, sustainable forest management, etc. The lack of capacities, knowledge and skills in particular, could be attributed two reasons: one, the concept of ILM is fairly new and, two, most professionals in the field of agriculture, livestock and forestry sectors are trained in natural science with limited bend for social sciences which underpin the ILM concept.

The combined SAS responses reveal a low level of capacity[1] for mainstreaming ILM elements into agriculture, forestry and livestock the sector plans and implementing, monitoring and evaluating ILM initiatives[2].

Review of curricula of the College of Natural Resource (CNR), UWICER and Rural Development Training Center (RDTC) confirmed that the subject is not yet taught in their regular syllabus.

Since the ILM approach is knowledge-intensive and long-term process requiring best practices for agriculture, livestock, forestry, fisheries and aquaculture (FAO, 2017, p. 06), this study recommends carrying out extensive awareness about the ILM concept, knowledge and skills; building skills to mainstream ILM into agriculture, forest and livestock sector plans; and exploring possibility of promoting the ILM concept through educational and training institutes for the long term benefits.

(b)   Multi-stakeholder Platform

Agriculture, livestock or forestry involves diverse stakeholders. However, the FGDs revealed that as the agriculture, livestock and forestry sectors formulate sector plans and implement them unilaterally; multi-stakeholder platforms do not exist. The FGDs also revealed a lack of awareness about the ILM itself as a "packaged" holistic approach and multi-stakeholder platform as a starting point to promote the approach. Some discussants construed multi-stakeholder platform as 'one-off set up' for consultative planning. The SAS revealed a lack of capacities for carrying out stakeholder analysis, resource mapping and ensuring enabling mechanism for stakeholder participation, which is consistent with the finding of the FGDs.

As such, there is a need to create awareness about the meaning, objectives and the importance of multi-stakeholder platform. The technical capacities for stakeholder analysis, institutional mapping, development mapping, resources mapping, multi-stakeholder decision making and initiatives, analysis of stakeholders' power relations and assessment of stakeholders' capacities need to be developed.

(c)   Shared Understanding of Landscape Multiple Objectives

The FGDs revealed that the practice of agreeing on a shared understanding of landscape multiple objectives does not exist. Agriculture, livestock and forestry sectors prepare the sector plans independently. In the current practice, the sectors, governed by different

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[1] Respondents were asked to rate the capacities of their sectors to mainstream ILM elements and climate change impacts into sector plans in the following seven areas: (i) stakeholder analysis, (ii) resource mapping, (iii) visioning, (iv) enabling mechanism for stakeholder participation, (v) negotiation, tradeoff and synergies etc., (vi) designing cross-scale institutional arrangements for collaboration and coordination and the capacities to foster (vii) Intra-sectoral participation and coordination.

[2] Capacity to (i) Facilitate regular interactions among the stakeholders (ii) Application of effective communication strategies (iii) Test improved resource management practices (iv)Adopt monitoring, reporting and verification (MRV) mechanisms (v) Adaptive management (vi) Conflict Management (vii) Application of cross-scale institutions, and, (viii) Intra-sectoral participation and coordination.

institutions, pursues individual sector objectives. While stakeholder consultations are said to be carried out, there is no practice of developing a shared understanding of landscape multiple objectives. For example, it feature in the FGDs that obtaining forestry clearance for felling trees in the construction of irrigation channels and farm roads is cumbersome because the forestry sector does not feature as a stakeholder in these programs. The FGDs also noted that while the forestry and livestock sectors have roles in the organic agriculture and the sustainable land management programs, the agriculture sector faced difficulty to implement these programs because objectives of the programs were not developed in collaboration with the two other sectors. Similarly, FGDs confirmed that while stakeholder consultations are conducted, the practice of agreeing on a shared understanding of objectives are not apparent in formulating plans for local forest management, protected area management and forest management units.

Thus, there is a need to set up an inter-sectoral mechanism for developing and agreeing on a shared inter-sectoral understanding in the programs requiring inter-sectoral participation. Similarly, it is recommended that a stakeholder participation in developing shared cross-sectoral understanding of sectoral programs that require participation of cross-sectoral and cross-scale stakeholders, including local communities, be institutionalized.

(d) Collaborative Planning

The RNR Sector Five-Year Plan is prepared in keeping with the Local Government Act, 2009; the Annual Grants System and Assignment of Functional and Financial Responsibilities for Local Governments; the Local Development Planning Manual (LDPM) 2014; and the Planning Guidelines of the Gross National Happiness Commission (GNHC).

The Act, Manual and Guidelines require the Sector to subscribe to the principles of coordination, collaboration and consolidation. The LDPM prescribes broader participation of stakeholders in the preparation of their plans and working in an effective, transparent and accountable manner (p.01). However, it emphasizes more on 'socio-economic development' planning, while ILM advocates balancing conservation and development.

The FGDs confirmed that the Sector Five Year Plan is prepared to ensure that the Agency Key Results Areas (AKRAs) are aligned with the GNHC-set National Key Result Areas (NKRAs). Some focus group discussants stated, "The NKRAs, AKRAs and Local Government Key Result Areas (LGKRAs) harmonized through bottom-up planning and consistency checks as a way to arrive at an agreement among the stakeholders." To achieve the AKRAs, agriculture and the livestock sectors prepare Gewog and Dzongkhag Plans using the Manual and Guidelines. It is said that the forestry sector plan is prepared departmentally. Unlike the agriculture and livestock sector plans, forestry sector plan does not form part of the Gewog and Dzongkhag Plans.

As forests have multiple functions and serve diverse stakeholders, the National Forestry Policy of Bhutan (2011) prescribes landscape approaches to planning and implementation of forestry program. Invocation of the policy prescriptions during the preparation of forestry sector plan, however, is questionable. The FGDs confirmed that in spite of the policy requirement for ILM approach, minimal involvement of stakeholder takes in the process of formulating forest and protected area management plans.

Addressing food and nutritional security problems involves concerted effort of forestry, livestock and agriculture sectors. The Food and Nutritional Security Policy 2014, implies that the three sectors formulate their plans and implement in an integrated manner, but the sectors often formulate their plans and implement sectorally. The task of enhancing rural cash income, for example through production and marketing of non-timber forest products, would need ILM approach among farmers, forestry, marketing department, and the private sector. They need to discuss and reconcile tradeoffs and promote synergy. By the same token, production and marketing of dairy products would require forestry, livestock, farmers and marketing department to practice integrated landscape management. Similarly, irrigation management would require forestry, irrigation, agriculture and farmers to collaborate in planning and implementation. However, the FGDs revealed that such collaborative planning and implementation does not take place.

The situation is very similar with the organic agriculture and sustainable land management programs. These programs require agriculture, livestock and forestry sectors and farmers to collaborate. But the FGDs revealed that these programs are struggling to secure genuine participation from the forestry and livestock sectors.

Generally, the focus group discussants stated that ILM is relevant for addressing multiple issues that affect forest and agricultural landscapes and integration needs to be fostered across the RNR Sector and beyond to include other sectors such as roads, municipality, and hydropower sectors etc. Some of them stated, "Under the present institutional set up whatever little integration occurs, occurs by default and often ad hoc, driven by initiatives of individual staff." Review of the twelfth Five-Year RNR Sector Plan also reveals that forestry; agriculture and livestock development plans are sector-specific with limited or no integration.

Therefore, the following are recommendations for strengthening capacity for collaborative planning in the RNR sector:

- Revision of the LDPM, 2014, to facilitate balancing of conservation and development in Gewog and Dzongkhag agriculture and livestock development plans;
- Institutionalize the mechanism and practice of inter-sectoral and cross-sectoral stakeholder participation in the preparation of forestry, livestock and agriculture sectoral plans;
- The forestry, agriculture and livestock sectors need to promote genuine stakeholder

participation as prescribed by existing policy instruments in formulation and implementation of the sector plans.

(e)   Effective Implementation

In the existing system, the agriculture, livestock and forestry sectors implement the sector plans independently according to the five-year plan targets, key performance indicators and results frameworks. Generally, the FGDs pointed out that to ensure the delivery in keeping with the AKRA, implementation is top-down which discourages collaborative implementation and reinforces silo approach. The inter-sectoral collaborative implementation is not a norm as individuals implement sector-specific plans. Similarly, the existing practice lacks involvement of cross-sectoral stakeholders in the implementation of forestry sector plans. For example, local communities are not involved in the implementation of plans related to forest management unit, protected area management and local forest management. Even the watershed management plans, though integrated, situational analysis confirmed that the forestry, agriculture and livestock sectors implement their respective activities sectorally. Therefore, the study recommends institutionalization of inter-sectoral and cross-sectoral involvement of stakeholders in the implementation of sectoral plans.

(f)   Monitoring for Adaptive Management and Accountability

In the existing practice, regular supervision and monitoring are carried out in keeping with the sectoral plans. Monitoring concerns primarily with ensuring outputs that fulfill the LGKRAs and AKRAs to meet NKRAs. From the FGDs it appears that monitoring for ensuring accountability is more important than adaptive management. For example, some participants remarked, "The line department questions if adjustments are made to sector plans and the audit objects the adjustments." The ILM specific monitoring framework is yet to become available. Therefore, RNR Sector would need to improve its current monitoring system and practice as the ILM specific monitoring frameworks develops.

(g)   Governance, Finance and Market Catalysts

Even though governance, finance and markets play an instrumental role in catalyzing the ILM initiatives, the study found limited public participation and vertical and horizontal coordination among and across public agencies. Similarly, and as shown by the experiences elsewhere, there is limited private investments especially in the areas or activities that promotes ILM approach. The markets for products and services are not adequately monetized or leveraged.

Therefore, it is recommended to strengthen genuine, holistic public participation including the communities and its representatives and enhance the vertical and horizontal coordination among and across public agencies. Possibility to redirect or design government supports for investors in areas that promote ILM initiatives, joint investments of public and private actors

and screen and fast track the lending of financial institutions need to be explored.

4.3.2 Institutional Capacity

This section presents results of FGD, SAS and literature reviews related to institutional capacities of the RNR Sector as below.

(a) Forest Policy and Legal Frameworks

Literature review noted that the National Forest Policy of Bhutan (2011) prescribes integrated landscape approach to sustainable forest management. However, the focus group discussants from the forestry sector did not seem certain of this policy provision. It also prescribes the requirement to manage watersheds in an integrated and holistic manner by involving all stakeholders. The policy recognizes the use of forests for grazing. It is cognizant of the role of forests and non-wood forest products in poverty reduction and sustaining rural livelihoods. The policy also prescribes the use of parks for eco-tourism and outsourcing management of some protected areas to private enterprises to enhance cash income of local communities.

The analysis of the Forest and Nature Conservation Act of Bhutan, 1995 and the Nature and Forest Conservation Rules and Regulation, 2017 confirmed that the Act and Rules were framed based on the Forest Policy, 1974. They are yet to be updated to decree the National Forest Policy of Bhutan, 2011.

This study, therefore, recommends creating awareness about the National Forest Policy of Bhutan (2011) among forestry, livestock and agriculture sector officials and the private sector to help promote the concept and practice of ILM. Similarly, forest legislation and the rules needs to be updated.

(b) Agriculture Policy and Programs

The National Food and Nutritional Security Policy of the Kingdom of Bhutan, 2014 recognizes the role of sustainable forest management for food, fodder and fuel. It also recognizes the need to strengthen watershed protection and management for food production. Similarly, the National Organic Farming Framework (2006) recognizes the need for the forestry and livestock sectors to collaborate with the agriculture sector in the implementation of the program. However, the sectors are yet to integrate their actions to implement the policy and the program, whether it is between forestry and agriculture, forestry and livestock or between agriculture and livestock sectors. The FGDs indicated that the sectors are not implementing the policy adequately. The FGDs also confirmed that both NOP and SLMP are yet to integrate the support of the other two sectors. The discussants felt the need for the sectors to collaborate their actions to implement the policy and the programs.

Hence, it is recommended that mechanisms be instituted to enable the sectors implement the policy and programs collaboratively.

(c)   Sectoral Planning Frameworks

The forestry, agriculture and livestock sectors use frameworks to prepare sectoral plans. For example, the Forest Management Code of Bhutan (2004) guides the formulation of plans for Forest Management Unit and the Local Forest Management. Community Forestry, Protected Areas Management, NOP and SLMP use individual planning frameworks. The review confirmed that there is an opportunity to integrate ILM into the Code and planning frameworks.

(d)   Other Institutional Concerns

The FGDs pointed out that some forms of integration are inherent in the RNR Sector that the discussants view as "legacy of the RNR days". The discussants were of the view that the Sector has an opportunity to capitalize on the legacy to mainstream ILM concept: the forest, agriculture and livestock policies need to be harmonized and planning, implementation and monitoring the sectoral programs and plans be in integrated in view of the ILM concept. Government and donor funds can be used to advance IML initiatives. Some discussants were of the view that lack of clarity in the roles of central and Dzongkhag agencies vis-a-vis that of Gewog staff in the implementation of Gewog plans weakens effectiveness and efficiency of the implementation of the plans.

Therefore, the study recommends to:
● Harmonize the existing policies of different sectors;
● Integrate planning, implementation and monitoring of sectoral programs and plans;
● Clarify the roles and responsibilities of central and Dzongkhag agencies vis-à-vis that of Gewog staff; and,
● Use government and donor funds to advance ILM initiatives.

4.4   Climate Change Capacity Gaps and Recommendations

While the agriculture, biological diversity and water resources are vulnerable to climate change impacts (CIAT, 2017; SAPA, 2016), institutional, infrastructure, human, and technical capacities are lacking across the RNR Sector. The existing capacity gaps presented below reflect outcome of literature review, FGDs, and SAS. The gaps are grouped under technical and institutional categories.

4.4.1 Technical Capacity

The knowledge on climate change is key to adaptation and mitigation to climate change impacts.

At the moment, as revealed by this assessment, technical capacity to generate knowledge on the impact of climate change on agriculture and livestock, forests and biodiversity and water resources is lacking. Therefore, technical capacity needs to be strengthened as follows:

(a)   Temperature-Increase Projection

The National Centre for Hydrology and Meteorology (NCHM) has carried out temperature-increase projection for the country (data not yet released for public consumption during the time of this study). To make this projection useful for the RNR Sector, capacity to analyze the implication of the national projection to the RNR Sector is required.

(b)   Meteorological Data

The existing meteorological data on temperature, wind, rainfall and humidity are inadequate for designing adaptation plan to climate change for the Sector. For example, daily average rainfall and temperature data may not be suitable for devising climate change adaptation plan for agriculture. Therefore, capacity to collect meteorological data useful for such purpose needs to be strengthened in collaboration with NCHM.

(c)   Vulnerability Assessment

Precise knowledge on the vulnerability of agriculture, forests and biodiversity, and water resource to temperature increase, and extreme events such as intense precipitation, drought, fires, erratic rainfall, windstorms, climate-induced pest, diseases, invasive species and disasters is deficient. Therefore, technical capacity to generate adequate knowledge in these areas is required.

(d)   Customization and Dissemination of Technologies

Globally, there are numerous climate smart technologies and approaches for addressing problems of shortage of irrigation water, reduced soil fertility, higher incidence of pests and diseases, drought-affected crops, etc. (CIAT, 2017). There is an opportunity to customize such technologies to the local context and disseminate to farmers. Therefore, research capacity needs to be strengthened for this purpose.

4.4.2 Institutional Capacity

Effective implementation of mitigation and adaptation plans depends on policies and cooperation at all scales. Effective planning and implementation of adaptation and mitigation options call for new institutions and institutional set up that span multiple scales (IPCC, 2014). Based on the literature reviews, FGDs and SAS; the institutional capacity issues and recommendations for the Sector are as given below.

(a)   Formulating New Policy

Climate actions need to be guided by an unambiguous policy provisions for mitigation and adaptation. As yet, the agriculture and livestock sectors do not have climate change policy per se. Therefore the sectors need to formulate and adopt policies for which technical capacity needs to be built.

(b)   Strengthening Policy Implementation

The National Forest Policy (2011) does have provision to integrate climate change impacts into forest governance and management. However, there is no plan that translates the policy into action. Therefore, capacity building to implement the policy provision is needed.

(c)   Sectoral Planning Frameworks

The forestry, agriculture and livestock sectors use frameworks to prepare sectoral plans. For example, the Forest Management Code of Bhutan (2004) guides the formulation of plans for Forest Management Unit and the Local Forest Management. Community Forestry, Protected Areas Management, NOP and SLMP use individual planning frameworks. The review confirmed that there is an opportunity to integrate climate change into the Code and planning frameworks.

(d)   Climate Change Impact Awareness

The FGDs and SAS revealed that across the RNR Sector and at all levels (central, Dzongkhag and Division) the understanding and awareness of climate change impact on agriculture, biological diversity and water resources are limited. Therefore, a concerted nationwide effort to raise awareness about climate change impact on agriculture and food security, water resources, and forests and biodiversity is needed.

(e)   Meteorological Data Collection

The existing meteorological data on temperature, wind, rainfall and humidity are inadequate for designing adaptation plan to climate change for the Sector. For example, daily average rainfall and temperature data may not be suitable for devising climate adaptation plan in agriculture. Therefore, program of action to customize meteorological data collection for the RNR Sector needs to be developed and implemented in collaboration with NCHM.

(f)   Mitigation and Adaptation Planning

The review of the RNR Sector 12 FYP made evident that climate change adaptation and mitigation do not feature distinctly in the agriculture, livestock and forestry sector plans. Therefore, there is a need to address this shortcoming by improving the planning framework

and by fostering an understanding on mainstreaming of climate change mitigation and adaptation planning.

(g)   Research and Extension Program Improvement

The FGDs revealed that research programs of forestry, agriculture and livestock do not receive the needed investment and focus. Similarly, climate change interventions form a negligible part of the agriculture, livestock and forestry sector extension programs. Therefore, research and extension programs need to be expanded to give the required focus on the climate change impacts mitigation and adaptation.

5   CAPACITY BUILDING PROGRAM AND IMPLEMENTATION STRATEGY

The capacity building program in this section is drawn from the issues and recommendations presented in the results section. The program captures technical and institutional capacities of ILM and climate change impacts.

5.1   Capacity Building Program

The capacity issues and programs are presented below in detail.

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Technical Capacity Development Programs related to ILM				
Capacity Area 1: Concept of Integrated Landscape Management Concept		✓		
• ILM concept taken as synonymous with other concepts, e.g. SLM, watershed management etc.; • Low levels of knowledge & skills for mainstreaming the ILM concepts into policies, programs and plans; and, • ILM not included in the curricula of educational institutes such as CNR, UWICER or RDTC.	• Improve IML concept understanding; • Build knowledge and skills for ILM mainstreaming; • Include ILM concept in education/ training curricula.			

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[3] The priority levels of capacity building focus under each capacity area are ranked from 1 to 3 considering the need to promote ILM elements incrementally (in a step-by-step fashion).

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 2: Multi-stakeholder platform		✓		
• Limited platforms for multi-stakeholder; • Lacks awareness of multi-stakeholder platform; • Multi-stakeholder platform construed as 'one-off set up' for consultative planning; • Lacks capacities to carry out stakeholder analysis, resource mapping etc.	• Stakeholder Mapping • Development Mapping; • Resources Mapping; • Institutional Mapping; • Power Mapping; • Capacity assessment of stakeholders.			
Capacity Area 3: Shared Understanding of Landscape Multiple Objectives			✓	
• Practice of arriving at shared understanding of landscape multiple objectives does not exist; • Governed by different institutions and, thus, pursues sectoral objectives. • Lack of inter-sectoral collaboration affecting planning and implementation of sectoral programs and plans	• Strategic Environmental Assessments (SEA); • Social Assessments (PRA, RRA etc.) • Priority setting tools such as CBD's ecosystem approach and integrated approaches to forested landscape conservation; • Systematic conservation & development planning; • GIS mapping; • Spatial Ecosystem Services mapping; • Value and supply chain analysis; • Drivers trend analysis of land use and land use change; • Vulnerability assessment and analysis for ecosystems, species and communities; • Environmental Impact Assessments (EIA) for projects; • Managing project preparations and planning for Climate Change Adaptation; • Analysis of multiple objectives and benefits for multifunctional landscapes; • Water evaluation and planning system.			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 4: Collaborative Planning				✓
• RNR Sector Five-Year Plans prepared using various planning instruments of the Gross National Happiness Commission (GNHC); • LDPM (2014) emphasizes more on 'socio-economic development', not balance between conservation and development as done by ILM; • Like agriculture and livestock sector plans, forestry sector plan not integrated into Gewog and Dzongkhag plans; • Forestry, agriculture and livestock Fiver-Year Plans sector-specific and non-integrated; • Invocation of the national forestry policy during the preparation of forestry sector plan questionable; • Lack of integration in agriculture, livestock and forestry sector plans despite integration and coordination required by the National Food and Nutritional Security Policy 2008; • No practice of stakeholder involvement beyond RNR sector & the little integration occurs by default and ad hoc basis driven by initiatives of individual staff.	• Participatory visioning and visualization workshops; • SWOT analysis; • Scenario development tools; • Landscape zoning; • Theory of change with results chain; • Multi-sector spatial planning • Results chains and log-frames preparation; • Budgeting; • Satellite collaring; • Methodologies on species movements; • Understanding of Human-wildlife conflict guidelines of WWF; • Social skills for planning community forests; • Social skills for planning FMUs and local area forest management planning; • Social skills for designing agriculture and livestock development interventions.			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 5: Effective Implementation				✓
• The agriculture, livestock and forestry sectors implement their plans independently as per five-year plan targets, key performance indicators and results frameworks; • To achieve Key Result Areas, nature of implementation is top-down which discourages collaborative implementation and reinforces silo approach; • Inter-sectoral collaborative implementation is not a norm; • Similarly, existing practice lacks involvement of cross-sectoral stakeholders in the implementation.	• Partnership and partner brokering • Facilitating skills for meetings and interactions • Prioritization of activities, etc.			
Capacity Area 6: Monitoring for Adaptive Management and Accountability				✓
• Regular supervision and monitoring are carried out in keeping with the sectoral plans; • Monitoring concerns primarily with ensuring outputs that fulfill the LGKRAs and AKRAs to meet NKRAs; • Monitoring for ensuring accountability is more important than adaptive management.	• Long-term target setting • Geo-referencing of activities in the landscape • Baseline/end-line and benchmark setting; • Community monitoring of socio-economic conditions; • Social surveys; • GIS and Remote sensing application in monitoring landscape; • Social surveys; • Using landscape measures scorecards; • Landscape outcome assessment methodology.			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 7: Governance, Finance and Market Catalyst				✓
• Enabling environment for public participation, vertical and horizontal coordination among and across public agencies are lacking; • Effort to mobilize private investment funds in ILM is missing; • No practice of providing support or redirect supports to sectors that promote ILM initiatives to encourage joint investments, screen and fast track lending and investments processes of financial institutions etc. • No prominent efforts to monetize and leverage products and services with monetary values.	• Collaborative landscape governance • Assessment of payment for ecosystem services • Sustainable landscape certification and labeling • Theme-based livelihood options			
Institutional Capacity Development Program Related to ILM				
Capacity Area 1: Forest Policy and Legal Frameworks			✓	
• National Forest Policy of Bhutan (2011) prescribes integrated landscape approach to sustainable forest management, but not yet put to practice; • The Forest and Nature Conservation Act of Bhutan, 1995 and the Nature and Forest Conservation Rules, 2016 framed based on the Forest Policy, 1974 and not updated to decree the National Forest Policy of Bhutan, 2011.	• Advocacy and awareness about policy intents and provisions; • Update policy provisions of new policies; • Capacity building for implementing policy.w			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 2: Agriculture Policy and Programs			✓	
• The National Food and Nutritional Security Policy of Bhutan requires sustainable forest management for food, fodder and fuel; • It requires strengthening of watershed protection and management for food production; • The National Organic farming framework recognizes the need for the forestry and livestock sectors to support its implementation; • The policy intent and the program objectives not realized in an integrated manner.	• Institute a mechanism to enable the sectors implement the policy and programs collaboratively.			
Capacity Area 4: Sectoral Planning Frameworks				✓
• Forest Management Code of Bhutan (2004) which guides the planning and implementation of Forest Management Unit Plans and the Local Forest Management Plans lacks ILM aspects; • Community Forest Management Plan and Protected Area Management Plans also do not yet integrate ILM aspects; • National Organic Program and Sustainable Land Management Program, etc. do not address ILM issues.	• Community Forest Management Plan, Protected Area Management Plan, National Organic Program and Sustainable Land Management Program, etc. need to be revised to incorporating ILM elements; • Incorporate scope to address ILM concepts in Forest Management Code of Bhutan (2004).			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 3: Other Institutional Concerns			✓	
• Disarrayed forms of integration in the current institutional setting is being observed; • Existing policies governing different sectors promote strong sectoral orientations; • No overarching institutional arrangements to operationalize the concept of ILM; and, • Unclear roles of central and Dzongkhag agencies in the implementation of Gewog plans.	• Harmonize the existing policies of different sectors; • Integrate planning, • Implementation and monitoring of sectoral programs and plans; • Clarify the roles and responsibilities of central and Dzongkhag agencies vis-à-vis that of Gewog staff in the Gewog plan implementation; • Use government and donor funds to advance ILM initiatives.			
Capacity Development Program Related to Climate Change				
Capacity Area 1: Technical capacity		✓		
• Inadequate capacity of the sector to use existing data on temperature, wind, rainfall and humidity to design sector adaptation plans of the NCHM; • Limited collaboration with NCHM to make climate related useable data for the sector; • Limited technical capacity to carry out vulnerability of agriculture, forests and biodiversity, and water resource to temperature increase, extreme events such as intense precipitation, drought, fires, erratic rainfall, windstorms, climate-induced pest, diseases, invasive species and disasters; • Inadequate capacity to tap on existing knowledge and customize technologies to the local context and disseminate to farmers.	• Introduction to climate change processes; • Disaster/climate vulnerability and risk assessment tools for RNR Sector; • Analysis and collection of meteorological data; • Customization & dissemination of climate smart technologies.			

Current situation	Capacity Building Focus	Priority levels[3]		
		1	2	3
Capacity Area 1: Institutional Capacity		✓		
• Agriculture and livestock sectors do not have climate change policy per se; • National Forest Policy (2011) requires to integrate climate change impacts into forest governance & management but no plans exist to translate the policy into action; • Understanding & awareness of climate change impact on the RNR Sector is limited; • Existing meteorological data on temperature, wind, rainfall and humidity are under-utilized by the sector to design climate change adaptation plan for the RNR Sector; • Program of action to customize meteorological data collection for the Sector is lacking; • Climate change research & extension programs of the sector do not receive needed investment and focus; • Forest Management Code of Bhutan (2004) which guides the planning and implementation of Forest Management Unit Plans and the Local Forest Management Plans does not have scope to address climate change impacts; • Community Forest Management Plan and Protected Area Management Plan, the NOP, SLMP, etc. do not have scope to tackle climate change impacts.	• Formulating new policy; • Strengthening policy implementation; • Climate change impact awareness campaign; • Institutionalizing program of action to customize meteorological data collection system for the sector; • Improving mitigation & adaptation planning; • Research & Extension Program Improvement; • Community Forest Management Plan, Protected Area Management Plan, National Organic Program and Sustainable Land Management Program, etc. need to be revised to tackle climate change impacts; • Incorporate scope to address climate change impacts in Forest Management Code of Bhutan (2004).			

5.2 Implementation Strategy

This study recommends three strategies to implement the capacity development program. One, a group of professionals, who has close association with the promotion of policy, program and implementation, may be selected and sent for training as Training of Trainers (ToTs). The implementing agency has the choice of either identifying such training institutes abroad to train ToTs or to tie up with an institution abroad and hire their services to be trained in-country. These ToTs can later train relevant officials gradually from central, regional, districts and at the local levels.

Two, for the long term benefit and to institutionalize the concept of ILM into major academic and research institutions, implementing agencies are recommended to explore possibilities to collaborate with Royal University of Bhutan, Vocational training institutes and research centers. CNR, RDTC, ARDC, UWICER and Regional Livestock Development Centers (RLDCs) are the starting point to explore this opportunity.

Finally, the capacities could be developed through exposure visits to cross-landscape experience elsewhere such as study tours, web-based resource portals, encourage online short courses and e-groups etc.

6 ANNEXES

6.1 References

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6.2 List of officials consulted for FGD

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   - Mr. D.N Chapagai, Assistant District Livestock Officer, Haa Dzongkhag, Haa
   - Mr. Tashi Wangchuk, Assistant District Agriculture Officer, Haa Dzongkhag, Haa

2. Jigme Khesar Strict Nature Reserve (JKSNR), Haa
   - Mr. Sonam Tobgay, Chief Forestry Officer
   - Mr. Ugyen, Head- Research, Information and Management Planning
   - Mr. Ngawang Dorji, Head- Species Protection and Conservation Section
   - Mr. Gyeltshen Dorji, Sr. Forest Ranger- Community Development & Recreation section

3. Agriculture Research and Development Center (ARDC), Bajo, Wangduephodrang
   - Mr. Pema Chofil, Program Director
   - Ms. Tanka Maya Pulami, Sr. Research Officer, Research Communications
   - Mr. Cheku Dorji, Head, Field Crop Sector
   - Mr. Gyeltshen Tshering, Head, Horticulture Sector
   - Mr. Thinley Jamtsho, Sector head, Irrigation Sector
   - Mr. Passang Tshering, Coordinator, National Wheat Program

4. Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER), Yusipang
   - Dr. Kaka Tshering, Program Director
   - Mr. Kelly Tobden Dorji Tamang, Sr. Forestry Officer
   - Mr. Yograj Chhetri, Forestry Officer

5. Department of Livestock, MoAF
   - Mr. Jigme Wangdi, Specialist, Livestock Production Division
   - Dr. M. P Timsina, Specialist and Advisor, Department of Livestock
   - Ms. Ganga Rizal, Deputy Feed and Fodder Officer, Animal Nutrition Division
   - Mr. Jamyang P. Tashi, Sr. Livestock Production Officer, Livestock Production Division

6. Department of Agriculture, MoAF
   - Mr. Wangda Dukpa, Chief Agricultural Officer, DoA
   - Mr. Kinley Tshering, Principal Agricultural Officer, DoA
   - Mr. Chenga Tshering, Agricultural Officer, Land Management Unit, NSSC
   - Mr. Sagar Acharya, Agricultural Officer, Department of Agriculture, DoA
   - Mr. Kezang Dawa, Agriculture Supervisor, National Plant Protection Center

7. Department of Forestry and Park Services, MoAF
   - Ms. Shab Tshering, Sr. Forestry Officer, FPED, DoFPS
   - Mr. Kinley Dorji, Sr. Forestry Officer, SFED, DoFPS
   - Ms. Namgay Bidha, Forestry Officer, NCD, DoFPS
   - Mr. Tashi Norbu Waiba, Sr. Forestry Officer, FRMD

8. Policy and Planning Division, MoAF
   - Mr. Sangay Chophel, Sr. Planning officer/ GEF-LDCF Focal
   - Mr. Pema Bazar, Project Coordinator/Sr. Program Officer, GEF-LDCF, GNHC
   - Mr. Nima P. Sherpa, Planning Officer
   - Mr. Sonam Pelgen, Planning Officer
   - Mr. Sherub Wangchuk, Sr. Panning Officer

6.3 Self-Administered Survey Respondents

- District Agriculture Officer, Dzongkhag Administration, Haa
- District Livestock Officer, Dzongkhag Administration, Haa
- District Agriculture Officer, Dzongkhag Administration, Thimphu
- District Livestock Officer, Dzongkhag Administration, Thimphu
- Chief Forestry Officer, Territory Division, Thimphu Forest Division, Thimphu
- District Agriculture Officer, Dzongkhag Administration, Wangdiphodrang
- District Livestock Officer, Dzongkhag Administration, Wangdiphodrang
- District Agriculture Officer, Dzongkhag Administration, Punakha
- District Livestock Officer, Dzongkhag Administration, Punakha
- Chief Forestry Officer, Territory Division, Forest Division, Wangduephodrang
- District Agriculture Officer, Dzongkhag Administration, Tsirang
- District Livestock Officer, Dzongkhag Administration, Tsirang

- Chief Forestry Officer, Territory Division, Forest Division, Tsirang
- District Agriculture Officer, Dzongkhag Administration, Sarpang
- District Livestock Officer, Dzongkhag Administration, Sarpang
- Chief Forestry Officer, Territory Division, Forest Division, Sarpang
- District Agriculture Officer, Dzongkhag Administration, Bumthang
- District Livestock Officer, Dzongkhag Administration, Bumthang
- Chief Forestry Officer, Territory Division, Forest Division, Bumthang
- District Agriculture Officer, Dzongkhag Administration, Zhemgang
- District Livestock Officer, Dzongkhag Administration, Zhemgang
- Chief Forestry Officer, Territory Division, Forest Division, Zhemgang
- District Agriculture Officer, Dzongkhag Administration, Trongsa
- District Livestock Officer, Dzongkhag Administration, Trongsa
- Chief Forestry Officer, Territory Division, Forest Division, Mongar
- District Agriculture Officer, Dzongkhag Administration, Mongar
- District Livestock Officer, Dzongkhag Administration, Mongar
- District Agriculture Officer, Dzongkhag Administration, Lhuntshi
- District Livestock Officer, Dzongkhag Administration, Lhuntshi
- Chief Forestry Officer, Jigme Khesar Strict Nature Reserve, Haa
- Head, Research, Information and Management Planning, JKSNR, Haa
- Head- Species Protection and Conservation Section, JKSNR, Haa
- Head, Community Development & Recreation section, JKSNR, Haa
- Program Director, Agriculture Research and Development Center, Bajo,
- Program Director, Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER), Yusipang

6.4 Self-Administered Survey Questions

Self-Assessment Questions

The Policy and Planning Division of the Ministry of Agriculture and Forests is implementing a UNDP-supported GEF-LDCF-financed project titled 'Enhancing Sustainability and Climate Resilience of Forest and Agricultural Landscape and Community Livelihoods in Bhutan.' The project has to assess the existing capacity gap within the Sector for planning, implementation and management of climate-resilient integrated landscape management and community development.

An integrated landscape approach requires landscape resource users to agree on a common vision, pursue their individual objectives without undermining the objectives of co-users and balance the environmental and development functions of the landscape. This approach also requires the users to do collaborative planning, implementation, management, and monitoring and evaluation.

The self-assessment survey questions have been framed to assess the existing capacity for the above-stated purpose, broadly, to assess (i) the institutional capacity, and (ii) the technical capacities.

The outcome of this assessment will be used to mainstream the concept of integrated landscape management approach into the future plans.

Sector _____ Dzongkhag _____

1. Institutional Capacity

1.1 Are you familiar with the concept of Integrated Landscape Management (ILM) approach?

Yes	☐
No	☐

1.2 If yes, can you describe it briefly?

_____

_____

_____

1.3 Your understanding of the following concepts (please tick appropriate):

Concepts	Level of Understanding		
	Low	Med	High
Integrated Landscape management	☐	☐	☐
Participatory- planning, implementation and M&E	☐	☐	☐
Intra-sectoral complementarity	☐	☐	☐
Balanced economic and environmental functions	☐	☐	☐
Sustainable landscapes	☐	☐	☐

1.4 Which parameters of climate change (temperature rise, precipitation, windstorm, drought, extreme weather events), would impact the sector (agriculture, livestock, forests, protected areas)?

_____

_____

_____

1.5   What risks and vulnerabilities are associated with these (from 1.4) different parameters of climate change to the sector?

_____

_____

_____

1.6   Does the sector have policy?

Yes	☐
No (skip to 1.9)	☐

1.7   If yes, is/are the existing sector policy (ies) enabling for ILM?

Yes	☐
No	☐

1.8   If enabling, how?

_____

_____

_____

1.9   If No, how can the sector mainstream ILM?

_____

_____

_____

1.10 Is/Are there any policy (ies) to address climate change issues in the sector?

Yes	☐
No	☐

1.11 If No, how can the climate change issues be addressed?

_____

_____

_____

1.12 Is/Are there existing legislation(s) for regulating ILM and climate change issues?

Yes	☐
No	☐

1.13 Does the sector have planning framework(s)?

Yes	☐
No	☐

1.14 If yes, does it address ILM elements and climate change issues?

Yes	☐
No	☐

1.15 Do you know strengthening climate resilience and ILM approach calls for cross-scale organizational set up (Ministry, Department, District/Division (forestry), Gewog levels) for intra-sectoral collaborative ILM and climate change planning, implementation, monitoring and evaluation?

Yes	☐
No	☐

1.16 Do cross-scale organizational set ups exist?

Yes	☐
No	☐

1.17 Strengthening climate resilience and ILM approach calls for collaborative governance (stakeholders plan and implement their plans, monitor progress and evaluate impacts and hold each other accountable for their actions in a transparent manner etc.). Does collaborative governance exist now?

Yes	☐
No	☐

2. Technical Capacity

2.1 What sort of technical knowledge would be required to formulate ILM and climate-resilient policies, legislations and planning framework?

_____

_____

_____

2.2 Mainstreaming ILM elements and climate change issues into sector plans involve application of knowledge as listed below. Rate the level of capacities of the sector:

Tools	Level of capacities		
	Low	Med	High
Stakeholder Analysis	☐	☐	☐
Resource Mapping	☐	☐	☐
Visioning	☐	☐	☐
Enabling mechanism for stakeholder participation	☐	☐	☐
Negotiation, tradeoff and synergies etc.	☐	☐	☐
Designing cross-scale institutional arrangements for collaboration and coordination	☐	☐	☐
Intra-sectoral participation and coordination	☐	☐	☐

2.3 Based on the status of knowledge (rated under as Q. 2.2), rate the capacity of the sector to:

Knowledge area	Level of understanding		
	Low	Med	High
Design sector plans for mainstreaming ILM and climate change issues (environmental & socio-economic) for forest, agriculture & livestock sectors	☐	☐	☐
Design biodiversity management plan for mainstreaming ILM and climate change issues	☐	☐	☐

2.4 For effective implementation, monitoring and evaluation of climate resilient ILM plans, following capacities are required for the sector. Rate the status of capacity of the sector:

Tools	Level of capacities		
	Low	Med	High
Facilitating regular interactions among the stakeholders	☐	☐	☐
Application of effective communication strategies	☐	☐	☐
Test improved resource management practices	☐	☐	☐
Adopt monitoring, reporting and verification (MRV) mechanisms	☐	☐	☐
Adaptive management	☐	☐	☐
Conflict Management	☐	☐	☐
Application of cross-scale institutions	☐	☐	☐
Intra-sectoral participation and coordination	☐	☐	☐

2.5 Following capacities are required for reducing GHG emissions from forestry sectors. Rate your capacity against each:

Knowledge area	Level of capacity		
	Low	Med	High
Setting up an integrated decentralized collaborated institutional and governance mechanisms for managing deforestation and forest degradation	☐	☐	☐
Practicing decentralized collaborated governance of forest resources	☐	☐	☐

2.6 What sort of capacity building components is required for reducing emission of GHGs from agriculture?

_____

_____

_____

2.7 How can the capacity be strengthened to reduce emission of GHGs from livestock enterprises?

_____

_____

_____

2.8 Climate change adaptation requires the application of following knowledge. Rate your capacity against each:

Knowledge area	Level of understanding		
	Low	Med	High
Analyze and discern climate change trends relevant to the sector	☐	☐	☐
Asses and synthesize risk, vulnerability, exposure and impact on forestry, livestock, agriculture and biodiversity	☐	☐	☐
Prepare and implement adaptation plans (forestry, livestock, agriculture and biodiversity)	☐	☐	☐

6.5 Focus Group Discussion Guides

(a) Non-ILM

- Different stakes and objectives
- Sectoral planning, implementation, M&E
- Intra-sectoral competition
- Economic and environmental functions imbalance
- Unsustainable landscape

(b) ILM concept

- Common understanding
- Participatory planning, implementation, monitoring and evaluation
- Intra-sectoral complementarity
- Balanced economic and environmental functions
- Sustainable landscape

Mainstreaming ILM into the Sector

1 Institutional capacity

A. Policy for:

- Fostering common understanding: participatory planning, implementation, monitoring and evaluation
- Intra-sectoral complementarity
- Balancing economic and environmental functions
- Addressing climate change risks and impacts
- Subsidy to strengthen IML and climate resilience
- Sustainable landscape

B. **Legislation and rules supporting:**
- Common understanding- participatory planning, implementation, monitoring and evaluation
- Intra-sectoral complementarity
- Balanced economic and environmental functions
- Promoting environmental and socio-economic climate resilience
- Sustainable landscape

C. **Planning framework:**
- Deciding common understanding: participatory planning, implementation, monitoring and evaluation
- Intra-sectoral complementarity
- Balancing economic and environmental functions
- Enabling climate-resilient planning
- Sustainable landscape

D. **Organizational set up:**
- Cross-scale (at the Ministry, Department, District/Division, and Gewog level) intra-sectoral collaborative ILM and climate-resilient planning
- Cross-scale (at the Ministry, Department, District/Division, and Gewog level) intra-sectoral collaborative ILM and climate-resilient implementation
- Cross-scale (at the Ministry, Department, District/Division, and Gewog level) intra-sectoral collaborative ILM and climate resilient M&E

E. **Improving Governance:**
- Coordination among public relevant agencies at different scales
- Coordination across public relevant agencies across different scales
- Clarification of land tenure arrangements & benefit sharing; and
- Prudent enabling mechanism for public participation

2   **Technical capacity**

A. **Institutional reform**
- Policy revision and legal reforms for ILM and climate resilience

B. **Stakeholder collaboration**
- Stakeholder analysis
- Stakeholder platform establishment
- Stakeholder engagement – roles & responsibilities, management of collaborative processes in policy formulation, legislative reforms, planning, implementation and M&E
- Partnership building for planning, implementation and M&E

C. **Collaborative planning – capacity for:**
- Collaborative integrated planning framework and guidelines
- Determining shared understanding
- Negotiation
- Activity planning
- Identification of synergies and trade-offs
- Designing integrated climate resilience (environmental and social) plans for forest, agriculture and livestock production systems
- Designing integrated climate resilient protected area management plan for biodiversity conservation

D. **Collaborative implementation and M&E**
- Organizing inputs and feedbacks from stakeholders
- Adaptive management
- Collaborative progress review
- Collaborative evaluation

E. **Capacity for:**
- Reducing mitigation of GHG from forests
- Reducing mitigation of GHGs from agriculture and livestock enterprises

F. **Capacity for Adaptation:**
- Discerning climate change trend in the sector
- Assessment of risk, vulnerability, exposure (forestry, livestock & Agriculture)
- Preparation of adaptation plans (Agriculture, forest, livestock)
- Implementation of adaptation plans (Agriculture, forest, livestock)

G. Research capacity for adaptation and mitigation

- Studying climate change trends relevant for the Sector
- Determining risks and impacts of climate change on forest, agriculture, and livestock production systems
- Synthesizing knowledge, both scientific and indigenous, for the sector
- Determining risks and impact of climate change on biodiversity