ROYAL GOVERNMENT OF BHUTAN

NATIONAL REDD+ STRATEGY AND ACTION PLAN

2020

Report Edition

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ROYAL GOVERNMENT OF BHUTAN
MINISTRY OF AGRICULTURE & FORESTS
Thimphu, Bhutan

MINISTER

MESSAGE

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SECRETARY

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ROYAL GOVERNMENT OF BHUTAN
DEPARTMENT OF FORESTS & PARK SERVICES
MINISTRY OF AGRICULTURE & FORESTS
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FOREWARD

Acknowledgement

Watershed Management Division

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Acronyms

BTFEC	National REDD+ Fund, the Bhutan Trust Fund for Environmental Conservation
CBA	Cost-Benefit Analysis
CF	Community Forest
CEF	Community Engagement Framework
CFMG	Community Forest Management Group
Cft	Cubic feet
CGISC	Centre for GIS Coordination
CO_2/CO_2e	Carbon dioxide/ Carbon dioxide equivalent
CSA	Climate-Smart Agriculture
CSO	Civil Society Organization
DoFPS	Department of Forests and Park Services
DRC	Department of Revenue & Customs
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FGRM	Feedback and Grievance Redress Mechanism
FMS	Fund Mobilization Strategy
FMU	Forest Management Unit
FNCA	The Forest and Nature Conservation Act 1995
FNCCR	Forest and Nature Conservation Rules and Regulations of Bhutan 2017
FRA	Global Forest Resources Assessment
FREL	Forest Reference Emission Level
FRL	Forest Reference Level
FYP	Five-Year Plan
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas Emissions
GHG-I	Greenhouse Gas Emissions Intensity
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit /German Society for International Cooperation
GNH	Gross National Happiness
GNHC	Green National Happiness Committee
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
KPI	Key performance indicator
LULUCF	Land Use, Land Use Change and Forestry
MoAF	Ministry of Agriculture and Forests
MoEA	Ministry of Economic Affairs
MoLHR	Ministry of Labour and Human Resources
MRV	Measurement, Reporting and Verification
MW	Megawatt

NBC	National Biodiversity Centre
NCB	Non-carbon benefits
NDC	Nationally Determined Contribution
NEC	National Environment Commission
NEPA	National Environmental Protection Act
NFI	National Forest Inventory
NFMS	National Forest Monitoring System
NFMS-AP	National Forest Monitoring System Action Plan
NFP	National Forest Policy
NIE	National Implementing Entity
NKRA	National Key Result Area
NLC	National Land Commission
NPV	Net Present Value
NRDCL	Natural Resources Development Corporation Limited
NRS	National REDD+ Strategy
NSB	National Statistics Bureau
NSSC	National Soil Services Centre
NWFP	Non-wood Forest Products
PA	Protected Area
PAMs	Policies and Measures
PES	Payment for Ecosystem Services
PF	Process Framework
QA	Quality assurance
QC	Quality control
RBP	Results-based payment
REDD+	Reducing Emissions from Deforestation and forest Degradation and the role of sustainable management of forests, conservation and enhancement of forest carbon stocks in developing countries
RGoB	Royal Government of Bhutan
RDC	Research Development Centre
RMA	Royal Monetary Authority of Bhutan
RNR	Renewable Natural Resources
RPF	Resettlement Policy Framework
R-PP	Readiness Preparation Proposal
RSPN	Royal Society for the Protection of Nature
SDG	Sustainable Development Goal
SDR	Social Discount Rate
SESA	Strategic Environmental and Social Assessment
SIS	Safeguards Information System
SLMS	Satellite Land Monitoring System
SRF	State Reserved Forest
SRFL	State Reserved Forest Land
TBL	Triple bottom line
TCB	Tourism Council Bhutan
UN	United Nations
UNDP	United Nations Development Programme

UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WMD	Watershed Management Division
WWF	World Wildlife Fun

Executive Summary

1. The Royal Government of Bhutan (RGoB) is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and is a REDD+ partner country. The objective of REDD+ is to reduce emissions from deforestation and forest degradation and increase carbon dioxide sequestration through the conservation of forest carbon stock, sustainable management of forests and enhancement of forest carbon stocks. REDD+ participant countries are eligible for results-based payments for verifiable emission reductions and/or enhanced carbon stocks.

2. Seeing the opportunities from REDD+ Bhutan has previously sought support through a Readiness Preparation Proposal submission to the Forest Carbon Partnership Facility (FCPF). An initial grant of USD 3.8 million was received in 2013, followed by an additional grant of USD 4.8 million in 2017. These grants have been utilized in the establishment of a national REDD+ framework, which is required prior to seeking REDD+ payments. The key elements of this framework are at the National REDD+ Strategy (NRS), National Forest Reference Emission Level/Forest Reference Level (FREL/FRL), a National Forest Monitoring System (NFMS), and a safeguards frameworks (Safeguard Information System, Strategic Environmental and Social Assessment, and Environment & Social Management Framework), as well as corresponding institutional and implementation arrangements. It is also equally important to undertake a thorough analysis of the drivers of deforestation and forest degradation, the development of a benefit-sharing framework, and to estimate the cost of implementing the NRS. This National REDD+ strategy document demonstrates the excellent progress that Bhutan has made in the preparatory process towards REDD+ implementation.

3. Bhutan is the only carbon negative country in the world, absorbing more carbon than it emits. The RGoB has made an international commitment to remain carbon neutral at all times. The cornerstone of this achievement is the country's sustainable forest management, with a constitutional mandate that requires a minimum of 60% forest cover. However, climate change poses a challenge to Bhutan's environment, development, and peoples' livelihoods. Temperature changes, unpredictable monsoon patterns, droughts and increases in pests and diseases will impact agriculture, hydropower along with other infrastructure developments, forest cover, biodiversity and water resources.

4. Bhutan's environmental, economic and social spheres are sensitive to climate change. Therefore, it is particularly important that response measures focus on a wide range of landscape level considerations. As such, the RGoB recognizes that addressing climate change, while still allowing for economic growth requires a multi-pronged approach centred on the preservation of existing forests. The cross-cutting nature of REDD+ will be critical in supporting Bhutan's national and international commitments.

Country Background

5. Bhutan is a landlocked country located in the Eastern Himalayas with a geographical area of 38 394 km^2. Bhutan has a wide geographic diversity and a range of climatic conditions that make it a rich repository of biological diversity and ecosystems. The most dominant land cover is forest, covering 70.46% of the total land area (MoAF 2017a). Approximately 51% of Bhutan falls under designated protected areas (PAs) comprised

of five national parks, four wildlife sanctuaries, a strict nature reserve and several biological corridors connecting the PAs (DoFPS 2016b; NEC 2016).

6. Bhutan has a population of 779 666 (NSB 2017a), which is still predominantly rural. Over the last 50 years, urbanization has increased, and approximately 37.8% of the population is now living in towns and cities (NSB 2018). Approximately 57.2% of the population are dependent on natural resources for livelihoods, including agriculture, livestock and forestry (MoLHR 2016). Agriculture is critical in ensuring food security, poverty reduction and income generation. The majority of farms are small-scale under two hectares and are predominantly subsistence-oriented.

7. At the core of Bhutan´s economy is the people-centred development philosophy of Gross National Happiness (GNH), which transcends every aspect of the economy. In addition, Bhutan follows a five-year socio-economic development planning cycle that takes steps forward to operationalise GNH. Currently, Bhutan is at the start of the 12th Five Year Plan (2018 to 2023). Economic growth has averaged at 6-7% per annum, reaching a Gross Domestic Product (GDP) of 2.512 billion USD in 2017 (World Bank 2018). While the primary sector is important from a livelihood perspective, the secondary and tertiary sectors have recorded the highest shares in the economy in recent years. The leading areas in the secondary sector are construction and electricity (hydropower) subsectors. Services in the tertiary sector, including tourism, have experienced good growth over the past few years. Poverty has reduced in the past decade, and Bhutan is on a path to graduate from a least developed country to the middle-income group.

Deforestation and Forest Degradation

8. A set of strong laws and policies have evolved to ensure the protection, management and sustainable use of forests. The management approach has shifted from having a primary focus on protection towards balancing conservation with sustainable management and forest utilization in the context of climate change and livelihoods. There are a number of management regimes including protected areas, community forests and forest management units.

9. Bhutan´s forest area was 2.70 million ha in 2015, amounting to a forest cover of 70.46% (MoAF 2017a). Between 2000 and 2015, approximately 64 111 ha have been deforested, while 140 819 ha of forest area was gained resulting in a total net forest area change of 76 708 ha. The analysis of the drivers of deforestation and forest degradation has shown that the majority of deforestation occurred within broadleaf forests, particularly at lower elevations (MoAF 2017a). Most deforestation took place outside the existing management regimes., About 17% of deforestation occurred within protected areas. The key drivers of deforestation are the allotment of State Reserved Forest Land and forest conversion for a range of purposes, which include hydropower projects, roads, agriculture, mining and quarries, and electricity transmission lines. During the period of 2015 to 2030, it is predicted that around 81 355 ha of the forest will be deforested as a result of these activities.

10. The FREL considers that all timber harvesting within Bhutan's management regimes is based on the principles of the sustainable management of forest (MoAF 2018). Therefore, the FREL does not include forest degradation as these activities do not result in a net reduction in long-term biomass and carbon. However, under the assessment of

Bhutan's drivers of deforestation and degradation study, analysis suggests that forest degradation is occurring to some extent (MoAF 2017a). The crown cover analysis shows that between 2000 and 2015, a total of 667 680 ha has been degraded, while 456 794 ha have improved. This results in a net degradation of 210 886 ha of the forest with an annual average of 14 059 ha. The share of dense forests remains high and is more than 50% of the total forest area. The majority of degradation has occurred in temperate zones, with 40% occurring within protected areas, where people still reside and are dependent on forest resources. The main causes of forest degradation are timber harvesting, firewood collection, forest fires and livestock grazing. During the period of 2015 to 2030, it is predicted that around 4.4 million m^3 of the forest will be degraded as a result of these activities.

11. The key underlying drivers of deforestation and forest degradation in Bhutan include governance challenges, inadequate law enforcement, economic pressures and poverty and demographic factors. Land allotment decisions are compromised by limited guidance on addressing sectoral interests, which is creating conflicts and a lack of an overarching long-term spatial planning policy. Stemming illegal activities is challenging, and there are potential loopholes in the timber allotment system to divert subsidized timber to urban markets. Poverty is decreasing, although strong challenges for some rural communities may result in pressures to degrade forest for either economic or practical reasons. Urbanization is increasing, which leads to farm abandonment. The subsequent reversion to shrubland can result in increased human-wildlife conflict in the remaining adjoining agricultural lands.

The Strategy

12. The Vision for this National REDD+ Strategy is 'A perpetually carbon neutral, climate change resilient and prosperous society'. The objective of REDD+ is to reduce emissions from deforestation and forest degradation and enhance carbon stocks through the conservation, sustainable management of forests and enhancement of forest carbon stocks. This strategy seeks to achieve these measures within a far broader vision that provides co-benefits, including enhancing livelihoods, protecting ecosystem services, and conserving biodiversity. Therefore, the focus is on continuing to strengthen the conservation of existing forests and increase the adaptive capacity to climate change impacts without compromising opportunities for future economic development and prosperity. To achieve this vision, there are four Strategy Options, which are multi-sectoral and take into consideration the unique status of Bhutan being a net carbon sink. All the four strategy options are equally important and can be considered as various strategic interventions.

13. **Strategy Option 1: Strengthened Forest Management Practices**. With the rapid economic development and demographic changes taking place in various parts of the country, the demand for construction timber is high and appears to be increasing. The overall forest resource base for commercial timber production is limited. These limitations are is due to the fact that large areas of the forest are protected, the low commercial quality of timber in some forest areas, and the difficulties in harvesting trees due to inaccessible terrain (WMD 2015). There are logistical and costs challenges of matching supply and demand in timber, and inefficiencies in downstream processing of timber, which are exacerbated by the narrow market preference for softwood tree species. The combination of inefficiencies in the timber value chain, distribution and

narrow focus on softwoods and few broadleaved species, means that in the future there is the potential for an artificial wood deficit. This strategy option focuses on the underlying drivers of deforestation and forest degradation. As such, this strategic option aims to support existing frameworks, policies, and regulations for forest management as well as strengthening resource management monitoring and enforcement.

14. **Strategy Option 2: Climate-Smart Primary Production**. Primary production sectors include crop production, livestock, fisheries and forestry. Climate-smart initiatives crosscut economic, social and environmental spheres. A key aspect in this strategic option is in improving forestry and agricultural productivity (detailed under strategic option 4), in order to improve incomes and reduce the need for primary production to further encroach into forest land. Climate-smart plantations of native, multi-purpose and fast-growing species will support the development and provision of sustainable firewood and timber supply, the protection of livelihoods, enhance areas of degraded forest and the management of forest growth to foster increased carbon sequestration. This will involve the development of a diversified and technologically innovative sector, which will be achieved through capacity building and partnerships between government and private sector. Combined efforts for the development of plantations in degraded areas will ensure forest restoration at the landscape level.

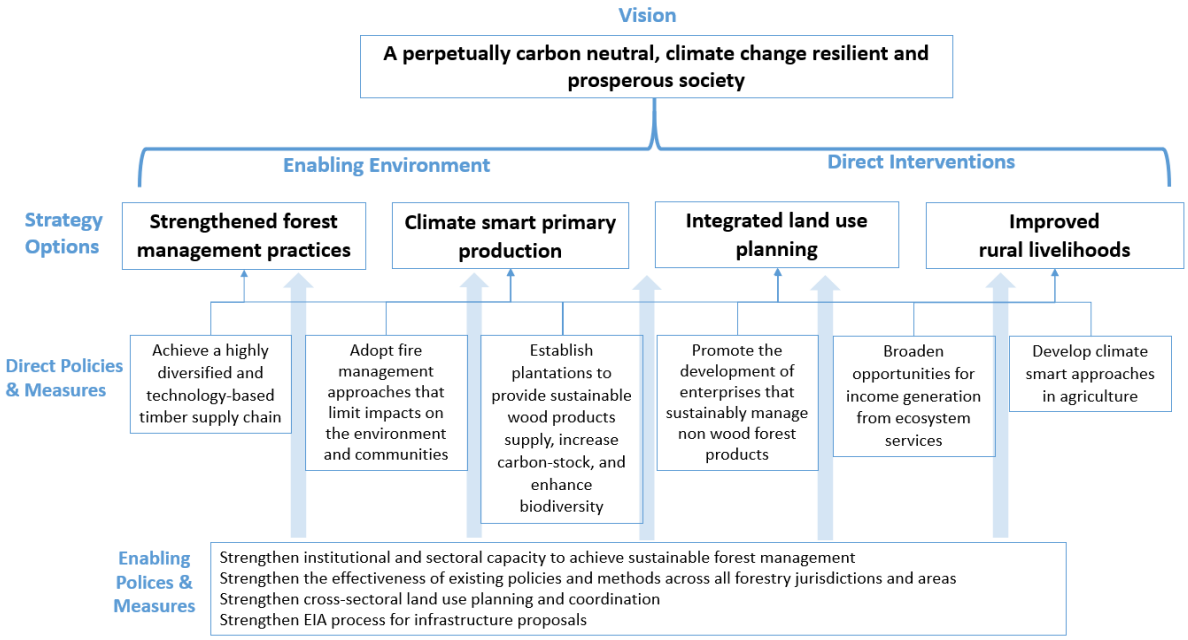
15. **Strategy Option 3: Integrated Land Use Planning**. This Strategy Option is largely about creating the necessary enabling environment for successful and effective implementation of REDD+. Development, including hydropower expansion, is important for the economy but must be undertaken in a way that limits impacts on forests. The existing legislation has provisions to address the environmental impacts of various infrastructure projects. However, the current planning processes tend to operate in silos and do not effectively address holistic impacts from significant development. There is a lack of spatial planning guidance and inadequate inter-agency and organizational cooperation. This Strategy Option will strengthen land use planning systems and processes, by achieving greater levels of harmonization across policies, increased collaborative processes, greater levels of capacity and a stricter monitoring and enforcement regime.

16. **Strategy Option 4: Improved Rural Livelihoods**. Rural communities depend on agriculture activities, livestock management and forest resources for their livelihoods. This Strategy Option is multi-sectoral and targets the improvement of community livelihoods including the broadening of opportunities for income generation through sustainable management of NWFPs, payment for ecosystem services, nature-based enterprises, and climate-smart agricultural and livestock practices. These approaches will help create alternative incomes for communities, as well as reducing pressures on forest areas. This strategic option aims to improve agricultural efficiency and increase diversification through climate-smart agriculture. Selected interventions will contribute to the transformation of agricultural systems in order to address food security, sustain livelihoods and encourage prosperity, adapt and build resilience to climate change risks while reducing pressure on forests and other ecosystems, incentivizing conservation and to reduce greenhouse gas emissions. Actions will involve the promotion of high yielding livestock, crop diversification, agroforestry, intercropping, greenhouse farming, advanced irrigation systems, soil conservation and organic farming.

17. The Strategy Options will be delivered via a number of cross-cutting policies and measures (PAMs). Under each PAM is a set of proposed actions, which will be the responsibility of different organizations for implementations. A number of PAMs are devised to develop the enabling environment, in order to ensure that policies, laws, regulation, approaches are strengthened and all work in harmony. These PAMs also address capacity and resource needs. This enabling environment is essential in addressing many of the underlying drivers of deforestation and forest degradation, and in providing the platform for direct interventions. Other PAMs provide direct interventions, which will reduce the impacts of deforestation and forest degradation while improving livelihoods and other co-benefits. Some of these interventions are entirely new, while others seek to build on existing initiatives.

18. The figure below summaries the Strategy, including the Vision, Strategy Options, and cross-cutting Policies and Measures.

Figure 1 NRS Outline of Vision, Strategy Options & PAMs



Feasibility and Cost Benefit Analysis

19. The feasibility analysis conveys how REDD+ and the Strategy Options fit into the context of the national economic development framework and to convey implications on existing policies and institutional establishments, including how deforestation and forest degradation are addressed. It further assesses the enabling conditions with respect to existing policies, regulatory measures, institutional settings, gaps and barriers that could limit the objectives of the NRS.

20. There are costs and investments required to implement the NRS and avoid or minimize displacement of emissions to other regions or sectors leakage (World Bank 2016a). Therefore, it is necessary to determine the cost and benefits that are likely to accrue from implementing the NRS. Such an analysis enables an understanding of the level of fund mobilization and benefit sharing. For this strategy, a cost-benefit analysis (CBA) was undertaken in which each of the PAMs were evaluated for costs and benefits generated over a period of 20 years.

21. The four Strategy Options and proposed intervention actions are highly relevant and respond to the identified drivers and underlying causes of deforestation and forest degradation. Quantitative and qualitative analysis shows that a combination of regulatory and institutional strengthening would have a greater impact on reducing deforestation and forest degradation. As noted, Bhutan has a wide range of suitable policies and opportunities, but enforcement and financial capacity have been significant barriers to effectiveness.

22. The combined results of the CBA, economic valuation, and climate change mitigation potential show that the four Strategy Options will enable Bhutan to address the direct and indirect drivers of deforestation and forest degradation while contributing to national economic development agenda. With regards to the ten PAMs, the range of net present values and climate change mitigation potential show that there is need to take a balanced investment approach to draw maximum returns and social, environmental, and economic benefits. Implementing the NRS is estimated to require approximately USD 54.5 million during the first five years.

1 BACKGROUND

1.1 Geographic Context

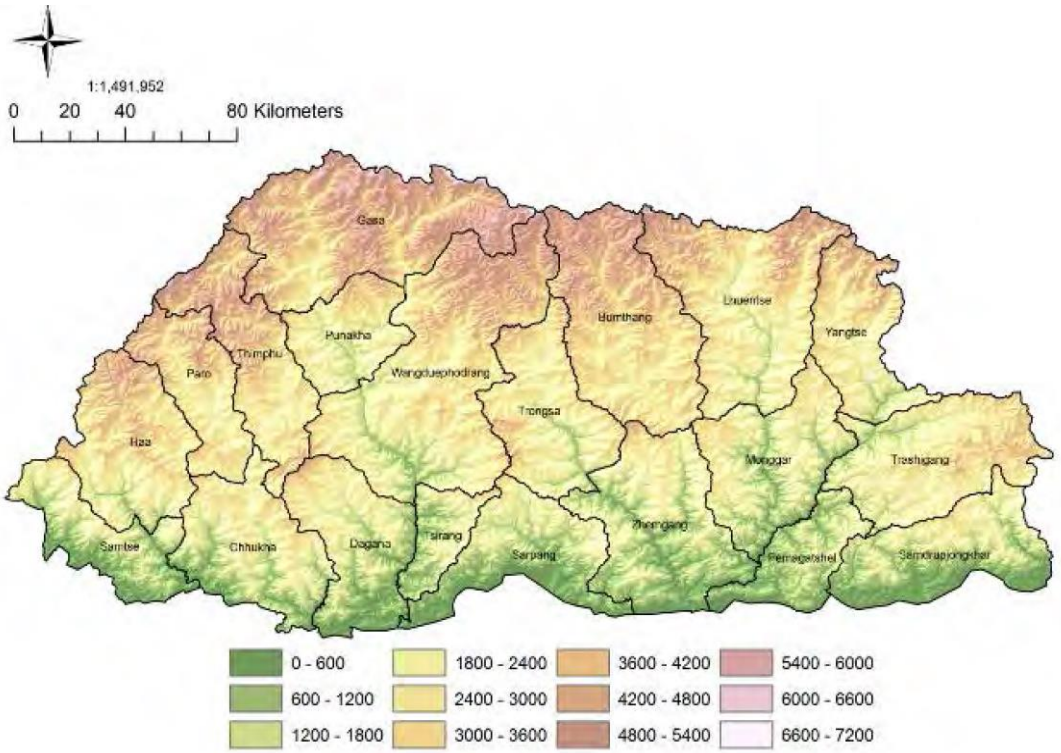
23. Bhutan is a small landlocked country located in the eastern part of the Himalayan mountains, with a geographical area of 38 394 km^2. The country is characterized by mountainous landscapes with steep precipitous slopes, which descend rapidly into narrow river valleys. The elevation ranges from approximately 100 m in the southern foothills to over 7 500 m along the main ridge of the Himalayas (Figure 2) (Norbu *et al*. 2008).

24. Bhutan has a wide range of geographic and climatic conditions, making it a rich repository of biological diversity and ecosystems. Conditions vary in different parts of the country due to changes in topography and altitude. There are three main climatic zones: subtropical in the southern foothills below 1 000 m and river valleys; temperate in the central parts below 4 500 m; and alpine in the northern parts above 4 500 m in altitude (Yangchen *et al.* 2015). There is a small area under glaciers and perpetual snow on the higher mountain ranges. Bhutan's average annual rainfall varies from 1 020 mm to 1 520 mm, with the majority of precipitation being generated from the annual monsoons (NEC 2006). Temperatures typically range from 15 ^{0}C to 30 ^{0}C in the subtropical zone and between -4 ^{0}C to 26 ^{0}C in the central temperate regions (NEC 2016).

25. The most dominant land cover is a forest, making up 70.46% of the total land area (MoAF 2017a). Approximately 51% of Bhutan falls under designated Protected Areas (Pas), comprised of five national parks, four wildlife sanctuaries, a strict nature reserve and several biological corridors (BCs) connecting the PAs (DoFPS 2016b; NEC 2016).

26. Bhutan has a population of 779 666, which is becoming increasingly urbanized with 37.8% estimated to be urban and 62.2% rural (NSB 2017a; NSB 2018). Since 2005 Bhutan's total population has increased by 16%, at a rate of 1.3% per annum. The population density has increased from 17 persons/km^2 to 19 persons/km^2, but the country still has one of the lowest population densities in the world.

Figure 2 Altitude Zones of Bhutan



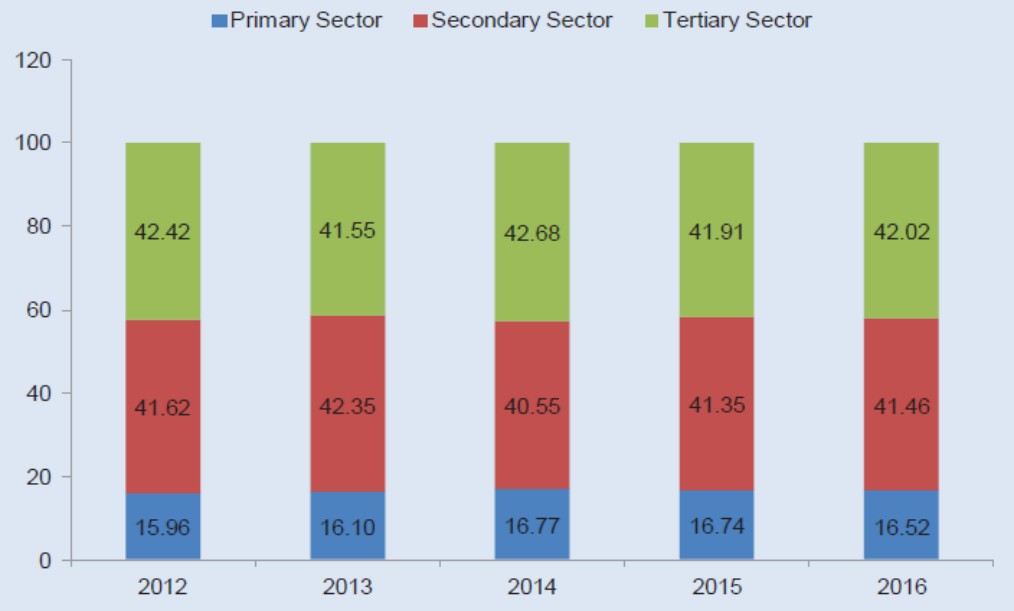
Source: NEC 2016

1.2 Social and Economic Context

27. At the core of the country´s economy is the people-centred development philosophy of Gross National Happiness (GNH), which transcends every aspect of the economy and is the driving force behind socio-economic development over the last five and half decades. The GNH Screening Tool evaluates, monitors, sets goals and raises the national consciousness about what conditions are conducive to the happiness and wellbeing of the people, and the country as a whole. Bhutan follows a five-year socio-economic development planning cycle that operationalises GNH. The planning cycle started with the first Five-Year Plan (FYP) in 1961. Under the guidance of the Gross National Happiness Commission Secretariat (GNHCS), the FYPs articulate the socio-economic development priorities and programs to be implemented. The 12th FYP covers the period from 2018 through to 2023 and adopts nine domains: education; health; living standards; ecological diversity and resilience; time use; culture; psychological well-being; community vitality; and good governance. The 12th FYP identifies national key results areas (NKRAs), which have been formulated based on national aspirations, priorities and international and regional commitments such as the Sustainable Development Goals.

28. Economic growth has averaged around 6-7% per annum over the last decade, with the economy reaching a Gross Domestic Product (GDP) of 2.512 billion USD in 2017 (World Bank 2018). As displayed in Figure 3 across the three broad sectors, the secondary and tertiary sectors record the highest shares in the economy (RMA 2017).

Figure 3 Structure of the Economy (Percent of GDP)



29. Bhutan's economic development agenda across all sectors relies heavily on natural resources and ecosystem services.

- **Primary Sector:** Bhutan is predominantly an agrarian country, with 57.2% of the employed population dependent on the natural resources sector comprising of agriculture, livestock and forestry (MoLHR 2016). Agriculture is critical in contributing to government priorities of ensuring food security, poverty reduction and income generation. Although there is a shift towards commercialism, Bhutanese agriculture is still largely based on the traditional subsistence oriented mixed farming systems that integrate cropping, livestock rearing and use of forest products (Gurung 2012). Agricultural production in Bhutan is predominantly small-scale, with 94% of farms cultivating on two hectares or less (MoAF 2012).
- **Secondary Sector:** The leading growth areas within this sector are the construction and electricity subsectors. The electricity industry has grown significantly over the past 10 years, as a result of the development in hydropower. In 2016 the share of hydropower sector was at 10.3% of the overall government revenues, at 32.4% of the total export earnings and at 13.38% of the overall GDP (DRC 2017; RMA 2017). Other industries in the secondary sector include mining, quarrying and manufacturing. The latter comprising of chemical, metal and wood-based industries.
- **Tertiary Sector:** The services sector has seen good growth in recent years. A significant contribution to the sector's growth came from transport, storage, communication, financing, insurance, real estate and business services sub-sectors in 2016. Tourism is a key growth area with the total number of visitors increasing from 155 121 in 2015 to 209 570 in 2016 (RMA 2017). The majority of visitors come to Bhutan due to the country's cultural activities, nature, ecology and adventure (TCB 2016). The industry provides many opportunities for employment generation with spill-over into the retail and other service sectors.

30. Poverty has been reduced from 31.7% in 2003; 12% in 2012; 8.2% in 2017 (NSB 2017b). Bhutan is on a path to graduate from a least developed country to the middle-income

group. However, the move towards higher development may put increased pressure on natural resources. The economic dependency on natural resources makes Bhutan particularly susceptible to the impacts of a changing climate. The high reliance on hydropower generation also makes the country vulnerable to any potential external impacts on the industry, such as global volatility in electricity prices. As such, the RGoB is increasing its efforts to explore and develop other industries, including cottage and small industries. REDD+ could provide a key solution through the implementation of Policies and Measures (PAMs) in the NRS to economic diversification and providing livelihood support for communities, particularly those that have significant disadvantages.

1.3 Environmental Context

31. **Climate change Impacts:** In addition to climate-induced environmental impacts, such as increased flooding, climate change poses a serious challenge to Bhutan's economic development and peoples' livelihoods. Farming communities will be directly impacted by temperature changes and unpredictable monsoon patterns caused by climate change. The glacial systems will experience faster rates of melting, affecting the base flow of rivers and potentially impacting hydropower and other infrastructure developments. Climate change is also likely to have a bearing on Bhutan's extensive forest cover, rich biodiversity and clean water resources, which are important attractions for visiting tourists. The sensitivity of Bhutan's economic and social spheres to climate change signal the importance of climate change response measures that focus on a wide range of landscape level considerations. These measures will directly or indirectly lead to the enduring preservation of forests.

32. **Low Carbon Development**: During the 2009 15th Session of Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen, the RGoB committed to remaining carbon neutral, ensuring that the Greenhouse Gas Emissions (GHG) will remain less than the sequestration capacity of its forests for all times. Bhutan's National Strategy and Action Plan for Low Carbon Development (NEC 2011) is a key step towards supporting the carbon neutral declaration. The strategy presents various scenarios analysing development paths from 2005 until 2040. In order to remain carbon neutral, transformative long-term legislative, policy, mitigation and adaptation measures are required to reduce GHG emissions.

33. **Climate Change Mitigation:** The fundamental basis of mitigation effort rests on conserving national forests as carbon sinks. However, it is also necessary to manage the growing emissions arising from economic development across other sectors. The RGoB already initiated a range of policies, regulatory measures and actions in relation to mitigation and adaptation. Some of the key actions include the development of the National Environment Protection Act (2007); National Strategy and Action Plan for Low Carbon Development (NEC 2012); Bhutan Transport 2040 Integrated Strategic Vision (ADB 2013); National Forest Policy (MoAF 2011); Nationally Determined Contributions (RGoB 2015); Economic Development Policy (RGoB 2016a); and the National Energy Efficiency & Conservation Policy (MoEA 2017). The RGoB is also in the process of developing a Climate Change Policy (NEC 2018 [draft]). The RGoB and the World Wildlife Fund launched Bhutan for Life, an initiative which aims to support the management of

Bhutan's protected areas network. The programme includes activities that increase forestry and climate change mitigation, as well as supporting ecosystem adaptation.

Box 1 NDC Priority Mitigation Measures for Low Carbon Development

- Sustainable forest management and conservation of biodiversity to ensure sustained environmental services.
- Promotion of low carbon transport system.
- Minimize GHG emission through the application of zero waste concept and sustainable waste management practices.
- Promote a green and self-reliant economy towards carbon neutral and sustainable development.
- Promote clean, renewable energy generation.
- Promote climate-smart livestock farming practices to contribute towards poverty alleviation and self-sufficiency.
- Promote climate smart agriculture to contribute towards achieving food and nutrition security.
- Energy demand side management by promoting energy efficiency in appliances, buildings and industrial processes and technologies.
- Integration of low emission strategies in urban and rural settlements through green buildings, sustainable construction methods and climate-smart cities.
- Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management.

34. The Second National GHG Inventory outlines that Bhutan is a net sink for greenhouse gases (RGoB 2017a). The estimated sequestration capacity of the national forest is 6.3 million tons of CO_2 equivalent (CO_2e), while the emissions in 2000 were only 1.6 million tons of CO_2e (RGoB 2011; RGoB 2017a). This is predominantly due to the large area of forest, low levels of industrial activity and almost 100% renewable electricity generation through hydropower. However, the analysis of drivers of deforestation and forest degradation highlights that there has been an increasing trend of degradation over the last fifteen years. As such, REDD+ is crucial in improving the carbon mitigation potential of the forestry sector, including carbon stock enhancement and increasing forest cover.

35. Although the highest emissions are from the agricultural sector, they have more or less remained constant (NEC 2015). However, emission trends from the industrial and transport sectors are rapidly increasing. During the period between 2000 and 2013, emissions from the energy sector increased by 192%: from approximately 0.27 million tons of CO_2e to approximately 0.79 million tons of CO_2e. During the same period, emissions from industrial processes increased by approximately 150% from 0.24 million tons to 0.6 million tons of CO_2e. Emission from waste management also increased by approximately 240%, from 0.047 million tons to 0.16 million tons of CO_2e.

36. **Climate Change Adaptation:** In recognition of the vulnerability of forests, water systems, glacial flows and agricultural production, the RGoB prepared a National Adaptation Plan of Action (NEC 2006). This plan helps to prioritize medium to long-term climate risks and provides appropriate response measures. The National Adaptation Plan of Action compliments existing regulatory and policy instruments that are geared towards protecting the environment. In the submission to the UNFCCC, Bhutan outlined a series of measures that form part of the Nationally Determined Contributions (NDC) (Box 2).

Box 2 NDC Priority Adaptation Measures for Low Carbon Development

- Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management.
- Promote climate resilient agriculture to contribute towards achieving food and nutrition security.
- Sustainable forest management and conservation of biodiversity to ensure sustained environmental services.
- Strengthen resilience to climate change induced hazards.
- Minimize climate-related health risks.
- Climate-proof transport infrastructure against landslides and flash floods, particularly for critical roads, bridges, tunnel and trails.
- Promote climate resilient livestock farming practices to contribute towards poverty alleviation and self-sufficiency.
- Enhancing climate information services for vulnerability and adaptation assessment and planning.
- Promote clean renewable and climate resilient energy generation.
- Integrate climate resilient and low emission strategies in urban and rural settlements.

37. Mitigation and adaptation measures must intersect and be complementary to existing environmental policies and regulations. At the centre of national resource use is the complex issue of land management, which is underpinned by the Land Act 2007. The Land Act created the National Land Commission (NLC), the lead body for land administration, management, surveying and mapping in Bhutan. Over the years it has become clear that to be effective, the Land Act requires supporting instruments and processes such as land zoning and land use capability analysis, and spatial planning to reduce sectoral policy and planning conflicts. The historical absence of a land use plan has been a significant limitation to effective environmental management.

38. **Sustainable Development:** In 2015, Bhutan adopted the United Nations "*The 2030 Agenda for Sustainable Development Goal (SDGs)*". Bhutan is amongst the first few priority countries rolling forward the implementation of the SDGs since its adoption in 2015. All 17 Goals are important, but Bhutan has prioritized three SDGs (Goal 1 – No Poverty; Goal 13 - Climate Action; and Goal 15 – Life on Land) for immediate implementation. These goals were prioritized on the basis of urgency to address the primary issue. Bhutan is committed to the global community to remain carbon neutral at all times (Climate Action) and to be a champion and world leader by show-casing success in protecting biodiversity (Life on Land)..

1.4 Forestry Context

39. The RGoB recognizes forests' values and honours them in its Constitution. Forest management in Bhutan has evolved over the years. The management approach has shifted from having a primary focus on protection towards balancing conservation with

sustainable management and forest utilization in the context of climate change and livelihoods. As such, the National Forest Policy 2011 has an overarching goal of sustainable management of forest resources and biodiversity conservation for meeting the long-term needs of people. The Forest and Nature Conservation Act 1995 (FNCA) provides the legal framework for appropriate forest uses and enabling community and social forestry. The Forest and Nature Conservation Rules and Regulations of Bhutan 2017 (FNCRR) cover general aspects of managing State Reserved Forest Land (SRFL), as well as management requirements for:

- ***Protected Areas*** cover 51% of the country's total area and are focused on the conservation of biological diversity and integrated development for people residing within the parks.
- ***Community Forests*** are managed by the local communities for meeting their requirements for forest produce. As of December 2017, there were 733 operational community forests throughout the country (MoAF 2017b).
- ***Forest Management Units*** cover 5% of the country and are areas prescribed for commercial logging and non-wood forest products.
- ***Watershed Management Plans*** are developed for degraded and critical watersheds.
- ***Heritage Forest***s are sacred areas protected for their cultural values and traditional rights.
- ***Local Forest Management Areas*** are areas outside of existing formal management regimes and are managed for local forest management.

1.5 REDD+ in Bhutan

40. The RGoB is a signatory to the UNFCCC and is a REDD+ partner country. Bhutan formally initiated the REDD+ program in 2010. The objective of REDD+ is to reduce emissions from deforestation and forest degradation and increase CO_2 sequestration through the sustainable management of forests, conservation of forest carbon stock and enhancement of forest carbon stocks. REDD+ participant countries are eligible for results-based payments (RBP) for verifiable emission reductions and/or enhanced carbon stocks.

41. Bhutan's REDD+ framework development falls into three phases, as displayed in Figure 4. Phase one is the readiness phase, during which the relevant institutional systems are established, and the national strategy is prepared. This stage is followed by a transition into phase two, which focuses on implementation activities based on the strategy. The third Phase involves the implementation of fully measured, reported, and verified actions, for which RBP could be received. The preparation of this national strategy document signals Bhutan´s transition towards phase three.

Figure 4 REDD+ Phases

42. Bhutan has sought support through a Readiness Preparation Proposal (R-PP) submission to the Forest Carbon Partnership Facility and has received an initial grant of USD 3.8

million in 2013, followed by an additional grant of USD 4.8 million in 2017. Through this support, the REDD+ readiness process in Bhutan has achieved some important milestones, which are required prior to seeking REDD+ RBP or financing for REDD+ implementation. These include:

- Establishing Institutional and implementation arrangements.
- Analysis of the drivers of deforestation and forest degradation.
- National REDD+ Strategy
- Institutionalization of the National Forest Monitoring System, which will help to regularly monitor and report forest cover changes and account for GHG emissions and removals from forestry.
- Development of a FREL/FRL, which provides the necessary tool for justifying Bhutan's position on carbon neutrality and implementing measures to protect and enhance forest cover.
- Preparation of a fund mobilization strategy, a safeguards framework, and drafting of a benefit-sharing framework.

43. The RGoB recognizes that addressing climate change, achieving environmental, economic and social aspects of sustainability requires a multifaceted approach from all sections of society. The importance of preserving forests through sustainable management is critical throughout this approach. REDD+ provides cross-cutting and complementary measures, which will provide opportunities to support and strengthen Bhutan's existing national and international commitments. Bhutan has demonstrated its commitment to being part of the global effort to combat climate change with its signatory position to the UNFCCC and ratification of the 2015 Paris Agreement. The holistic measures identified through REDD+ will help reduce deforestation and forest degradation, maintain forest cover and ensure that Bhutan remains carbon neutral, while also considering national economic development interests. REDD+ will help strengthen Bhutan's resilience to climate change, with/through forest conservation being essential for both mitigation and adaptation.

2 LAND USE AND LAND USE CHANGE, DEFORESTATION AND FOREST DEGRADATION

2.1 Definition

44. The National Forest Policy of Bhutan 2011 defines a forest as land with trees spanning more than 0.5 ha, with trees higher than five meters and the crown cover above 10% (MoAF 2011; RGoB 2017b). These areas have been considered for the purpose of establishing Bhutan's FREL/FRL. This definition also includes areas that are normally forest, which are temporarily un-stocked as a result of human interventions or from natural causes but are expected to revert to forest. This definition is consistent with the criteria thresholds of the Intergovernmental Panel on Climate Change's (IPCC) Good Practice Guidance (2006), and UNFCCC Decision 11/CP.17 (UNFCC 2012), as well as the definition adopted for the national forest inventory (NFI) of Bhutan (DoFPS 2016a), the land use and land cover mapping of Bhutan (DoFPS 2016b) and the Global Forest Resources Assessment (FRA 2015). The forest area can be further stratified into conifer forests, broadleaf forests and mixed forests.

45. The identification of drivers of deforestation and forest degradation is a critical component of the National REDD+ Strategy. Deforestation is a process of clearing and converting an area of forest on to different land use, such as agriculture, mining or infrastructure development. Forest areas that are temporarily un-stocked as a result of human intervention such as harvesting or natural causes, but are expected to revert to forest, are not considered as deforestation. Forest degradation is considered as a condition resulting in GHG emissions from activities in forest remaining as forest, i.e. that does not result in a land use change.

46. Deforestation and forest degradation should be viewed as separate processes, often resulting from different actors and drivers. Forest degradation is not necessarily a precursor to deforestation. Common drivers throughout the world include:

a. Direct (proximate) causes: human activities or actions that directly impact forest cover and loss of carbon. Global examples include:

- Deforestation: commercial agriculture, subsistence agriculture, mining, quarries, infrastructure and urban expansion
- Forest degradation: logging, fires, livestock grazing, disease and pathogens, firewood collection and charcoal production

b. Underlying/indirect causes: complex interactions of fundamental social, economic, political, cultural and technological processes. These drivers are often distant from their actual area of impact.

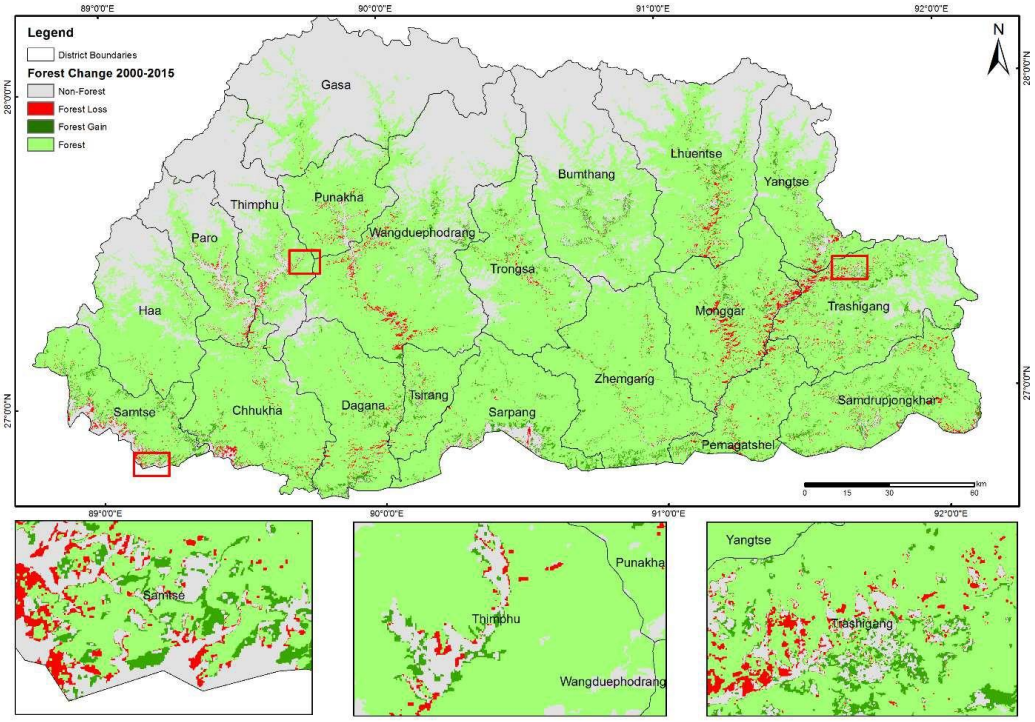
47. The relationship between underlying drivers and direct drivers is nuanced and/but describes a set of interactions and motivations that drive decisions and behaviour in relation to forests. Underlying drivers can be hard to identify, but they are crucial for understanding the reasons that various actors clear or degrade forests.

48. A full assessment of the drivers of deforestation and forest degradation in Bhutan was undertaken in 2017 (MoAF 2017a). This assessment included the identification and analysis of all critical drivers and agents; the resulting emissions; impacts of drivers; the barriers to forest conservation, forest enhancement and sustainable management; strategic options and key interventions; and the potential for increased carbon removals. The following sections provide a summary of the key information from the assessment.

2.2 Deforestation

49. Bhutan´s forest area increased from 2.63 million ha in 2000 to 2.70 million ha in 2015, resulting in a total forest cover of 70.6%. As displayed in Figure 5, during this 15-year period, 64 111 ha were deforested, while 140 819 ha of forest area was gained. This results in a total net forest area gain of 76 708 ha with an annual increase of 5 114 ha over this period.

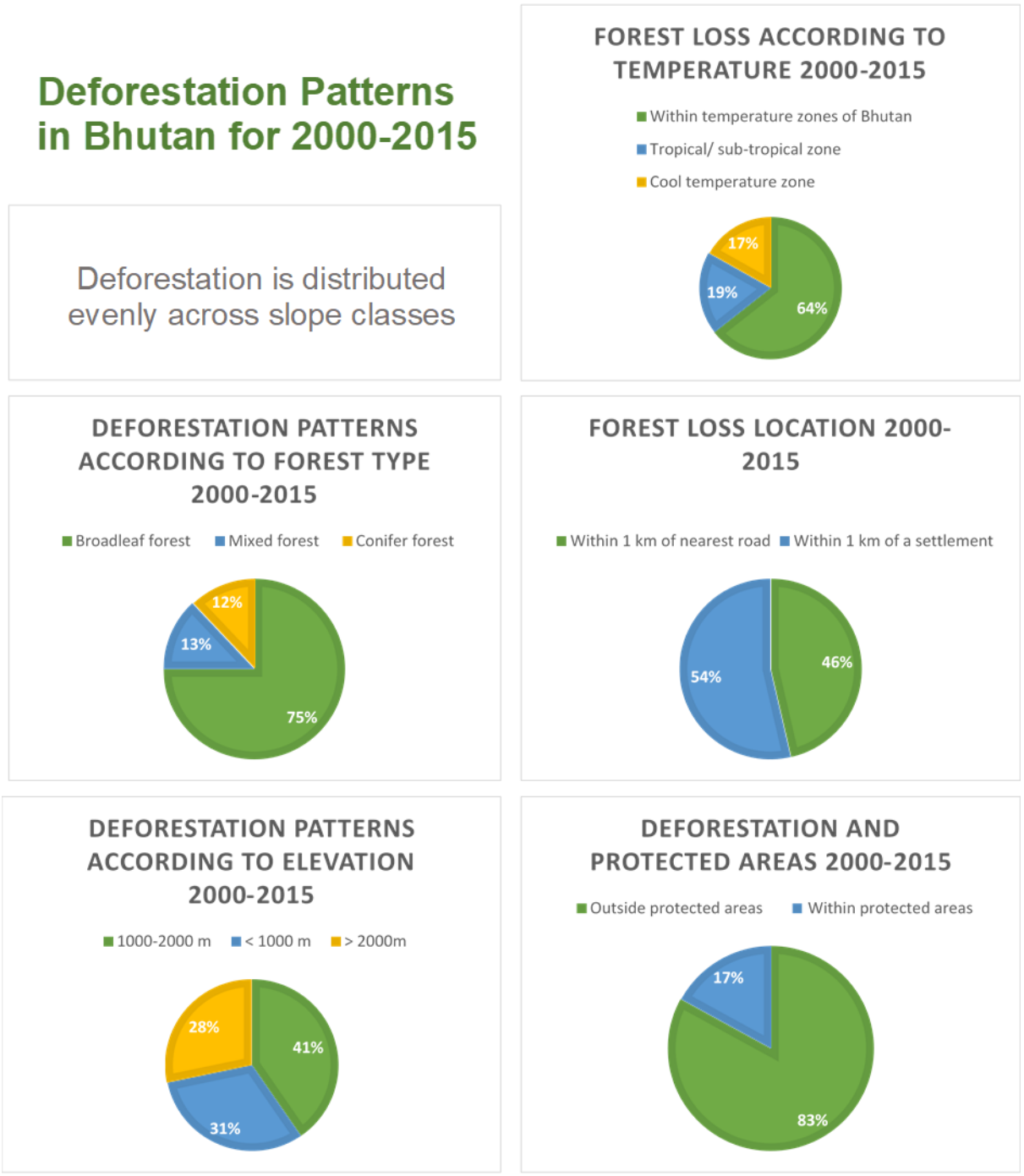
Figure 5 Forest Change 2000–2015



Source: MoAF 2017a

50. As illustrates in Figure 6 most deforestation occurred within close proximity of roads and settlements (58% within 1 km of a road; 67% within 1 km of settlements), and predominantly occurs outside of existing management regimes. Only 17% of deforestation occurred inside protected areas.

Figure 6 Deforestation Patterns



Source: Indufor adapted from MoAF 2017a

51. Deforestation in Bhutan is primarily a result of conversion to other land use by planned human activities. Table 1 provides details of deforestation drivers, in order of rank based on estimates of forest areas affected annually. Future rates of deforestation are also estimated, based on either historic rates of annual averages of deforestation or predictions of trends.

Table 1 Summary Statistics by Driver

Driver	Historic Rate 2008-2014 (hectares)	Background	Predicted Rate 2015-2030 (hectares)
1. Allotment of State Reserved Forest Land (SRFL)	12 674 ha of SRFL were allotted at an annual average rate of 1 923 ha [1.32 million tonnes of carbon dioxide equivalents per year (MoAF 2018)]	SRFL may be allocated for a variety of purposes including conversion to agricultural land and for large development projects such as hydropower and mining.	28 845 ha of deforestation
2. Hydropower Projects	2 276 ha have been deforested which averages out to 272 ha per hydropower project and a total average of 1 880 ha per year	Nearly 100% of Bhutan's needs are generated from hydropower, and 75% of generated electricity is exported (Lean and Smyth 2014). The hydropower potential is estimated to be 30 000 MW significantly higher than currently generated.	39 760 ha of deforestation based on future hydropower plans [28 200 ha based on historic trends]
3. Roads	5 770 ha of SRFL were allotted to road construction between 2008-2014 at an annual average of 820 ha	Roads are key for access to communities and for new infrastructure development projects. The RGoB has focused on improving existing highways as well as increasing road network coverage with road density doubling from 1.5 km/km² in 2005 to 3 km/km² in 2011.	12 300 ha of deforestation
4. Agriculture	36 298 ha were converted to agriculture between 2000-2015 with 90% of this conversion occurring in the last five years of this period. 24 631 ha reverted back to forests resulting in a net loss of 11 667 ha of forests or 778 ha annually.	The 12th FYP prioritizes investments in boosting the enabling environment for increased agriculture production in order to address poverty issues food security and sustained GDP growth.	11 670 ha of deforestation

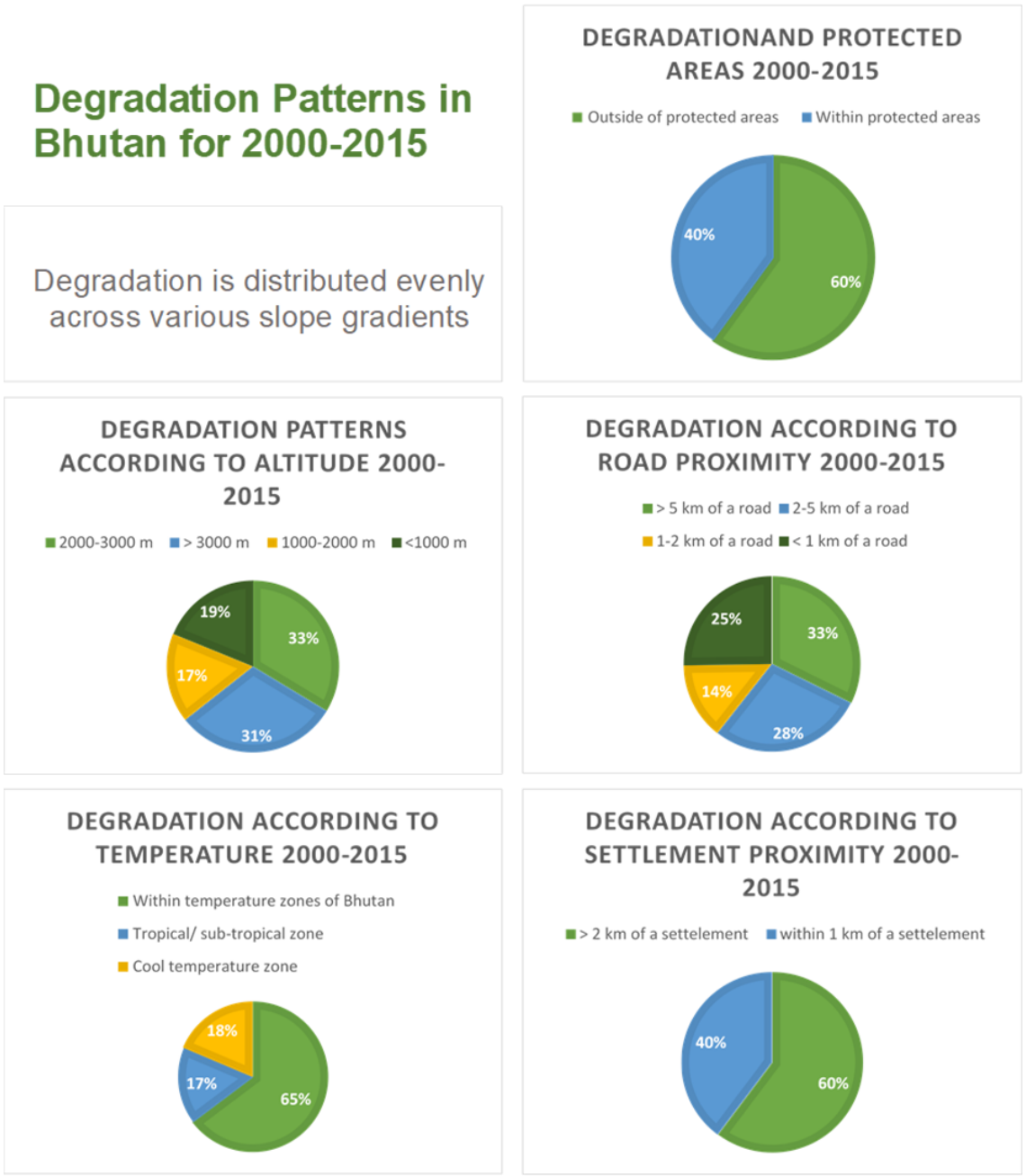
5. Mines and Quarries	3 800 ha were leased from SRFL for mining and quarrying at an annual average of 633 ha.	Mining is one of the fastest growing industries in the country with 48 active mines and quarries operating as of 2015. Bhutan possesses a range of minerals with dolomite and gypsum mining increasing as well as gravel sand and minerals used in construction.	9 495 ha of deforestation
6. Power Lines	3 791 ha of forest was lost to make way for power lines and buffer zones between 2008 and 2014 which converts to an annual average of 542 ha.	Power lines are required for new hydropower projects.	8 130 ha of deforestation

2.3 Forest Degradation

52. The assessment of Bhutan's drivers of deforestation and degradation study (MoAF 2017a) considered that timber harvested from forests as a source of forest degradation. Conversely, the FREL/FRL considers that all timber harvesting within Bhutan's management regimes are based on the principles of the sustainable management of forests (MoAF 2018). These management approaches involve replenishment of forests and, therefore, do not result in a net reduction in long-term biomass and carbon. In order to avoid double counting, the emissions resulting from wood extraction and removals are not considered as a separate activity under the FREL/FRL but are accounted for under the sustainable management of forests.

53. In assessing forest degradation, Bhutan used to change in crown cover as the proxy indicator for degradation. This showed that 667 680 ha of forests had been degraded (crown cover decrease) in the 15-year assessment period (2000 to 2015), while 456 794 ha have improved (crown cover increase), resulting in a net degradation of 210 886 ha of forest, with an annual average of 140 59 ha. As part of the FREL/FRL preparation, these figures were validated and new figures are reported as sustainable management of forests activity.

Figure 7 Forest Degradation Patterns



Source: Indufor, adapted from MoAF 2017a

54. Table 2 provides details of forest degradation drivers, in order of rank based on the extent of timber volumes estimated to be affected annually. It must be noted that these drivers do not always result in discernible changes in the forest cover. Future rates of forest degradation are also estimated, predominantly based on historic annual average degradation rates. This results in a total of 4 385 121 m^3 of forest degradation that is estimated to occur between 2015 and 2030, not including the impact of grazing livestock.

Table 2 Degradation Drivers

Driver	Historic Rate 2008-2014	Background	Predicted Rate 2015-2030
1. Timber Harvesting	The amount of timber (excluding firewood) extracted and supplied was 1 127 059 m^3, amounting to an annual average of 161 008 m^3.	Timber extraction and supply is broken down into subsidized timber for rural areas (72% of all timber extracted); commercial timber (27%); and Royalty Free timber (1%). As per the FNCRR 2017, every household in rural areas is entitled to 4,000 cubic feet (cft) of timber for house construction once in 25 years and 700 cft of timber for repair/renovation/extension once in 12 years (DoFPS 2017). Degradation from timber harvesting may be exacerbated due to poor tree selection, felling practices, and general wastage.	2 415 125 m^3 of tree loss is predicted to occur due to conversion to timber harvesting. This does not account for the loss from illegal timber harvesting.
2. Firewood	The amount of firewood extracted from forests was 594 552 m^3, at an annual average of 84 936 m^3.	Bhutan has one of the highest per capita domestic fuel wood consumption in the world. The major users of firewood are residential (75% of total consumption), industrial (13%) institutions such as schools (10%), and agriculture (2%; Dhital 2009). For residential users, firewood accounted for 87% of the fuel mix in 2014 and is used for cooking, heating and lighting (RGoB 2011; MoEA 2016). However, the efficiency of firewood devices is only 10%–15%. Although electricity has reached many rural areas, firewood is preferred as it is readily available, and people in rural areas collect dry firewood. The RGoB is promoting fuel-efficient cook stoves, use of biogas, electric bulb cookers, 100 units free electricity to rural areas, and tax subsidy on appliances.	1 274 041 m^3 of degradation is predicted to occur.
3. Forest Fires	Between 2009 and 2014 there were 334 fire incidents, affecting a forest area of 43 817 ha, at an annual	Forest fires in Bhutan originate from either accidentally or via intentional sources, such as clearance of forest for agriculture (NSSC 2014). Apart from degrading the forests, fires also result in emissions of carbon dioxide. Fires pose social and economic risks in terms of destruction of property, injuries, and death. Each year, significant forest areas burn in	93 894 ha (695 955 m^3) of degradation is predicted to occur.

	average of 8 763 ha.	Bhutan, which are difficult to control because of the country's rugged terrain.	
4. Livestock	No data to accurately assess the impact.	Grazing of livestock in forests is an integral part of Bhutan's agricultural system. Unregulated grazing is anecdotally acknowledged to contribute to forest degradation in localized areas. Clearly, the impact of grazing will depend on forest type and grazing intensity.	Predicted to be decreasing due to declining trends with nomadic grazing.

2.4 Underlying Causes of Deforestation and Forest Degradation

55. The underlying causes of deforestation and forest degradation in Bhutan range from governance challenges, law enforcement, economic pressures, poverty and demographic factors.

56. **Governance challenges:** Land allotment decisions are compromised by limited guidance on addressing sectoral conflicts and a lack of an overarching long-term spatial planning policy.

57. **Inadequate Law enforcement:** Law enforcement and stemming illegal activity is an increasing challenge, though the majority of the forest offences appear to be small-scale and opportunistic.

58. **Economic pressures and poverty:** The cycle of poverty in some areas is interconnected to land degradation and food security. However, Bhutan's poverty rate has significantly reduced in the past decade.

59. **Demographic factors:** By 2030, 50% of Bhutanese will be urban, according to UN population statistics. Urbanization has the potential to directly impact forests, as a result of the deforestation that is often required to make room for urban expansion. Furthermore, farm abandonment is occurring as a result of outmigration, especially in economically depressed areas where people are not able to produce enough food on their farms. Many of these farms are reverting to shrubland and forest. This improvement in habitat might lead to an increase in human-wildlife conflict in the remaining adjoining agricultural lands.

3 THE STRATEGY

3.1 Guiding Principles

60. The overarching guiding principles are those set by the Bhutan's Constitution and the vision of the GNH. The strategy recognizes the uniqueness of Bhutan with the country's net gains in forest area, a high percentage of forest cover, and achievement of being carbon negative are highlighted as a shining example to the rest of the world. This REDD+ strategy highlights the critical role of forests ecosystems to Bhutan's economy, historically and in the future. As such, the strategy is aligned with the principles of GNH and national flagship programs, as outlined in the 12th FYP.

61. The National REDD+ Strategy (NRS) outlines the vulnerability of Bhutan to climate change. This risk is predominantly due to the social and economic dependency on

natural resources, including the developmental focus of hydropower, and the predominance of livelihoods in the agriculture, livestock and forestry sectors. While acknowledging the success to date in maintaining a high level of forest cover and achieving carbon neutrality, the economic development trajectory will undoubtedly put more pressure on natural resources unless environmental policies, laws, regulations and capacities are strengthened. The pressure on natural resources and challenges that accompany economic growth are likely to increase as the country progresses towards becoming a middle-income country. Economic diversification and sustainable resource utilization will be key to ensuring that communities are resilient while enjoying the benefits and having access to opportunities to improve livelihoods.

62. This strategy supports the transition to low emissions, increased resilience to climate change and sustainable development pathways in the forestry, agriculture, energy, tourism and other cross-cutting areas. Based on this guiding principle, this REDD+ strategy extends beyond simply reducing carbon emissions from deforestation and forest degradation. These additional benefits include enhancing livelihoods, protecting biodiversity and other ecosystem services, improving forest governance, empowering relevant stakeholders by ensuring participation and supporting sustainable land use planning.

3.2 Approach to the Strategy

63. This strategy is anchored on five years of REDD+ readiness preparation to establish an implementation framework supported by strong national ownership and strong political commitment. National ownership and participation of stakeholders (including the community and private sectors) are two critical principles that should be supported by robust and technically rigorous work across the environmental, economic and social aspects. As such, this strategy sets the framework for implementation at both national and in a decentralized manner at the sub-national level.

64. This strategy is accompanied by a number of analytical documents, including:

- Analysis of Drivers of Deforestation and Forest Degradation.
- Feasibility and Cost Benefit Analysis
- Safeguards Framework: Strategic Environmental and Social Assessment (SESA), Environmental and Social Management Framework (ESMF) and Safeguards Information System (SIS).
- Benefit Sharing Framework and Fund Mobilization Framework.
- Forest Reference Emission Level and Forest Reference Level.
- Corruption Risk Assessment for REDD+ Program in Bhutan.

65. The analytical work carried out during the REDD+ readiness phase provided valuable insights into the sectoral strengths, challenges, and opportunities in managing natural resources, in a manner that reduces the impact of human activities and ensures sustainable resource use. The REDD+ framework does not just take a single focus but is designed with the flexibility to complement a broad range of national programs, including those already under implementation and those planned for the future. The strategy stresses the need for multiple, flexible and collective interventions, which mutually reinforce each other within and across all sectors.

66. This strategy represents the vision of a broad range of stakeholders, including government, forest-dependent communities, non-governmental organizations, CSOs and the private sectors. Through extensive consultation and collaborative process, which started in 2010, the government and stakeholders worked to identify potential strategy options and practical interventions. Annex 3 provides details of the key consultative workshops that were conducted.

67. This process was supported by a range of feasibility studies, assessing land use, governance capacity and knowledge for sustainable forest management. Multi-disciplinary and multi-sector dialogue and commitment are essential to the long-term success of this strategy. At each stage of developing this and implementing this strategy, engaging with all stakeholders has and will continue to be a fundamental requirement to ensure ownership and inclusiveness. This proactive and participatory approach has been guided by four key principles outlined in Table 3.

Table 3 Stakeholder Engagement Guidelines

Principle	Description
Participatory and inclusive	Relevant stakeholders and experts, including men and women from vulnerable and marginalized forest-dependent groups and communities, are included in the decision making on the design, implementation and evaluation of relevant REDD+ activities. They also participate in the implementation of relevant REDD+ activities whenever it is appropriate.
Transparency and accountability	This ensures a transparent feedback mechanism that is easily accessible and understandable to men and women from indigenous and non-indigenous local communities, in order to inform and improve current and future stakeholder engagement processes for REDD+.
Mutual understanding over shared responsibilities	Stakeholders understand how relevant REDD+ activities impact on themselves and agree what their roles and responsibilities are. This approach ensures the sustainability of the REDD+ programme
Human rights-based approach	Human rights-based approach identifies and differentiates rights holders and their entitlements from duty bearer and their obligations. Efforts are made to strengthen the capacities of rights holders to make their claims and duty bearers to meet their obligations

3.3 Vision and Mission

68. The vision relates to the desired future position of Bhutan and has been set as:

'A perpetually carbon neutral, climate change resilient and prosperous society'.

69. To achieve the vision, mission of the of the REDD+ program has been set as:

'Reducing deforestation and forest degradation by strengthening forest management & conservation, capacity building and participation, and implementing income generation activities to improve the livelihoods for a carbon neutral, climate change resilient and prosperous society'

70. The aims of REDD+ is to reduce emissions from deforestation and forest degradation and, therefore, enhance sequestration of CO_2 by the conservation, sustainable management of forests and enhancement of forest carbon stocks. Bhutan's NRS seeks to achieve these measures within a far broader Bhutan's National Strategy and Action Plan for Low Carbon Development since Bhutan's economy, society and culture are highly dependent on the country's natural resources.

71. REDD+ represents an opportunity for Bhutan to strengthen a number of climate change response measures across a range of areas, as articulated in the Policies and Measures outlined later in this strategy. Bhutan is unique amongst all REDD+ countries for being the only carbon negative country in the world. Bhutan already has high forest cover and a history of limited deforestation and forest degradation. During recent years there has been an increase in population, and an expansion of industry, infrastructure and transport. These trends are all expected to continue into the future. As such, it may not be realistic for emissions (both forest-related and across other sectors), to be substantially reduced beyond the current position. Instead, the focus is on continuing to strengthen the preservation of existing forests and increase the adaptive capacity to climate change impacts, without compromising opportunities for future economic development and prosperity.

3.4 Strategy Options

72. The Strategy Options define the general direction that Bhutan will take to achieve the vision of the REDD+ program. These strategic options are supported by feasibility and cost benefit analysis, strong social and environmental safeguards, benefit sharing framework and monitoring and evaluation. During the process of developing the strategy, a number of alternative options were examined before settling on the four strategic aims which will address the direct and underlying/indirect drivers of forest deforestation and degradation. All the four strategy options are equally important and can be considered as various strategic interventions.

STRATEGY OPTION 1: STRENGTHENED FOREST MANAGEMENT PRACTICES

73. With the rapid economic development and demographic changes taking place in the country, the demand for construction timber is high and increasing. However, overall forest resources available for commercial timber production are limited. These limitations are is due to the fact that large areas of the forest are protected, the low commercial quality of timber in some forest areas, and the difficulties in harvesting trees due to inaccessible terrain (WMD 2015).There are logistical and costs challenges of matching supply and demand for timber, and inefficiencies in downstream processing of timber, which are exacerbated by the high market preference for softwood tree species and few broadleaved species. The combination of inefficiencies in the timber value chain, distribution and narrow focus on softwoods, means that in the future, there is the potential for an artificial wood deficit.

74. The underlying causes of deforestation and forest degradation in Bhutan range from governance challenges, law enforcement, economic pressures and poverty and demographic factors. Consequently, this strategic option seeks to support the existing frameworks, policies and regulations for forest management as well as strengthening capacity, stakeholder and community participation, guidance and resource management monitoring and enforcement.

STRATEGY OPTION 2: CLIMATE SMART PRIMARY PRODUCTION

75. Primary production sectors include crop production, livestock, fisheries and forestry. Climate-smart initiatives crosscut economic, social and environmental spheres. A key aspect in this strategic option is in improving forestry and agricultural productivity (detailed under strategic option 4), in order to enhance incomes and thus reduce the need for primary production to further encroach into forest land.

76. Climate-smart plantations of native, multi-purpose and fast-growing species will support the development and provision of sustainable firewood and timber supply and will enhance the protection of livelihoods. They will also enhance areas of degraded forest and the management of forest growth to foster increased carbon sequestration. This will involve the development of a diversified and technologically innovative sector, which will be achieved through capacity building and partnerships between government and private sector. Combined efforts for the development of plantations in degraded areas will ensure forest restoration at the landscape level.

STRATEGY OPTION 3: INTEGRATED LAND USE PLANNING & MANAGEMENT

77. Given the sector's size and importance to the economy, hydropower development will continue. The expansion of hydropower facilities will have increasing adverse impacts on forests. This is due to the siting and construction of facilities and requirements for associated infrastructure.

78. The existing legislation has provisions to address the environmental impacts from various infrastructure projects. However, current planning processes do not effectively address the holistic impacts from the major projects. There is a lack of spatial planning guidance and inadequate inter-agency and organizational cooperation. Interventions are typically sector-based and operate in silos. This limits the implementation of cross-sectorial plans necessary in combating climate change. As a result, the broader impacts affecting environmental services are not included or adequately addressed.

79. This strategy will help create the enabling environment for the successful and effective implementation of REDD+. Work associated with this strategy will strengthen land use planning systems and processes, by achieving greater levels of harmonization across policies, improved collaboration among implementing departments/agencies, greater levels of capacity and a stricter monitoring and enforcement regime.

STRATEGY OPTION 4: IMPROVED RURAL LIVELIHOODS

80. Rural communities depend on agriculture activities, livestock management and forest resources for their livelihoods. This strategic option is multi-sectoral and targets the improvement of community livelihoods, including the broadening of opportunities for income generation through sustainable management of NWFPs, payment for ecosystem services, nature-based enterprises and climate-smart agricultural and livestock

practices. These approaches will help create alternative incomes for communities, as well as reducing pressures on forest areas, while also incentivizing conservation.

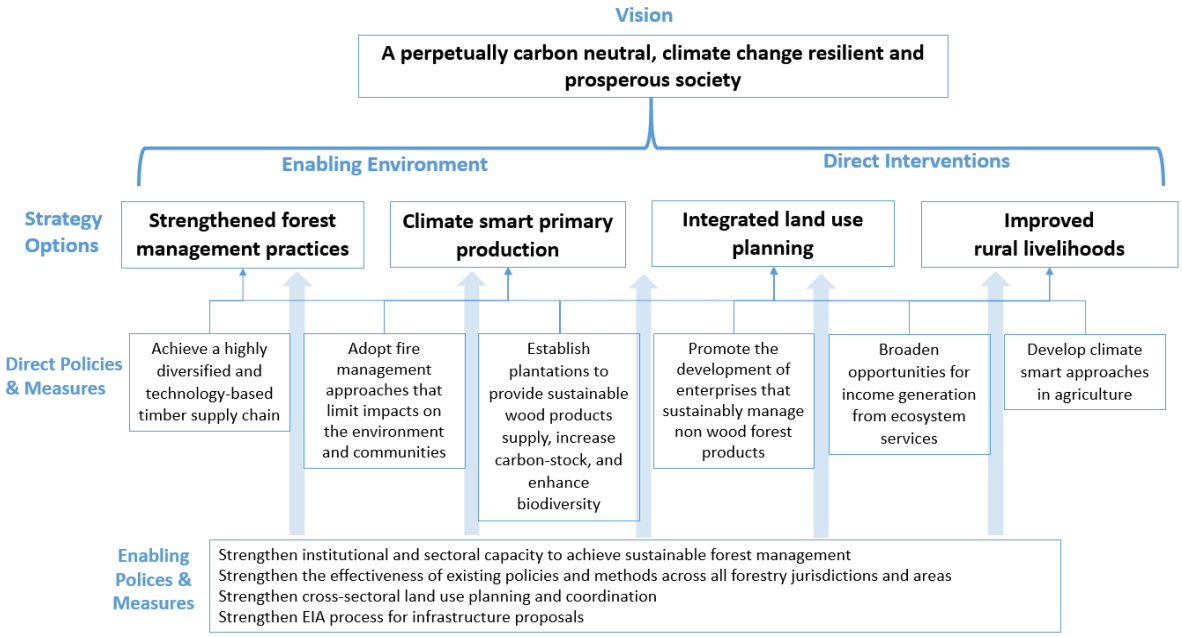
81. This strategic option aims to improve agricultural efficiency and increase diversification through climate-smart agriculture. This will contribute to the transformation of agricultural systems in order to address food security, sustain livelihoods and encourage prosperity, adapt and build resilience to climate change risks while reducing pressure on forests and other ecosystems and to reduce greenhouse gases emissions. This will involve the promotion of high yielding livestock, crop diversification, agroforestry, intercropping, greenhouse farming, advanced irrigation systems, soil conservation and organic farming.

4 POLICIES AND MEASURES

82. The Strategy Options presented in Section 3 will be achieved through a suite of cross-cutting policies and measures (PAMs) and specific interventions that support Bhutan's transition to low-emissions, resilience to climate change and sustainable development pathways in the forestry, energy, agriculture and other sectors. These PAMs have been selected through a combination of analysis of REDD+ readiness work and the extensive stakeholder consultation within Bhutan (as detailed in Annex 3), as well as bringing in good lessons and experiences from other countries.

83. This NRS incorporates a systems approach, with all of the PAMs contributing towards one or more of the Strategy Options. This approach, displayed in Figure 8, embraces the interdependency of individual activities and the interactions of the PAMs in achieving the overall vision.

Figure 8 NRS Vision, Strategy Options, and PAMs



84. The NRS approach recognizes that Bhutan has made significant progress in establishing a wide range of policies and regulatory measures, but limitations in necessary capacity for creating and managing policies, legislation, strategies and programmes (functional capacity) and the capacity in relation to climate change science, land use planning,

sectoral planning (technical capacity) have hindered full effectiveness of these measures. The Bhutan REDD+ readiness process has identified the main drivers and underlying causes of deforestation (and weakness and gaps in policies and regulatory measures). The starting point for this NRS is to strengthen these weaknesses and fill the identified gaps but/and acknowledging that regulatory reform maybe necessary in the future. In this regard, PAM 1 to PAM 4 seek to strengthen the institutional capacity for policy development, regulatory enforcement and operationalization of the NRS. These four enabling PAMs are essential in providing the platform for the transformative actions in PAM 5 to PAM 10, which focus on implementing a range of transformative actions. There are benefits and risks associated with each PAM, which have been identified and addressed in the SESA (RGoB 2018).

85. Under each PAM, is a set of proposed target actions which are also presented in a detailed Action Plan in Annex 1. In this operational plan, each institution has a range of roles and responsibilities for implementing these intervention measures, following a successful fund mobilization. This NRS acknowledges that despite REDD+ being housed in the forestry sector, but it is firmly cross-sectoral. Consequently, these target actions involve multiple ministries and sectors at both central and local levels.

4.1 PAM 1: Strengthen institutional and sectoral capacity to achieve sustainable forest management

Rationale

86. At a government level, there are capacity constraints to effectively implement policies on the ground, particularly in relation to policy and regulatory enforcement and knowledge on mitigation and adaptation to climate change. Governance and knowledge capacity gaps are mainly at local levels, including Dzongkhags and Gewogs. Across these administrative areas, the Field Offices of the Department of Forests and Park Services (DoFPS) develop and implement all forestry plans and programs. Almost all approvals and monitoring responsibilities have been decentralized to these field offices, and only contentious issues are forwarded to the Department and Ministry. The Field Offices will administer REDD+ implementation. Therefore, it is essential to strengthen capacity in these key areas.

PAM Objective

87. The objective of PAM 1 is to build national capacity for sustainable forest management across institutional, organizational and community levels. This includes strengthening capacity for the development and implementation of forest management plans, monitoring, and silvicultural practices. Training will be conducted for government staff, particularly at sub-national levels. By developing government capacity, PAM 1 will, in turn, strengthen stakeholder and community participation in forest management.

88. Both technical and functional capacity are required and will be defined through a comprehensive capacity needs assessment across relevant institutions that will have roles and responsibilities for REDD+ implementation. This assessment will identify the required capacity across all sectors, highlight existing gaps and prepare a capacity-building strategy.

Table 4 PAM 1 Target Actions

PAM 1 Target Actions
1.1 Undertake a capacity needs assessment for REDD+ implementation and develop a Capacity Development Strategy and Plan.
1.2 Build Institutional capacity for developing and implementation of management plans for forest management Unit (FMUs), protected areas, community forests, local forest management areas, watershed areas and private forests.
1.3 Build capacity building and strengthen National Forest Monitoring Systems (National Forest Inventory, Land Use and Land Cover Monitoring, and Measurement, Reporting and Verification (MRV) for REDD+).
1.4 Build capacity in silvicultural practices, pest and disease management to improve forest productivity through technical training.

Benefits and Risks

89. *Environmental Benefits:* This capacity development will help government and communities to sustainably manage forests, which will also contribute towards protecting habitats and biodiversity.

90. *Social & Economic Benefits:* Skills and knowledge on sustainable forestry and related disciplines will improve the abilities of staff and increase job satisfaction, as well as improving the guidance and support provided to communities.

91. *Risks:* Capacity building is not a one-off exercise, and there can be considerable costs and resources required to maintain capability building programs over time.

4.2 PAM 2: Strengthen the effectiveness of existing policies and approaches

Rationale

92. The National Forest Policy 2011, Forest &Nature Conservation Act 1995 and corresponding rules require all areas under State Reserve Forest Land (SRFL) to be guided by management plans, but there are many forests outside the existing management regimes of Protected Areas, Community Forests, Forest Management Units and Working Schemes, which are still without management plans. The lack of management plans, information and associated monitoring in these forests areas limits sustainable forest management since these areas are also major sources for timber extraction. The absence of data and information to determine sustainable levels of timber allocation, in relation to both current and future demand, is a significant policy implementation gap.

Objective and Target Actions

93. The objective of PAM 2 is to strengthen institutional and functional capacity for the implementation of existing policies to improve forest management and conservation of biodiversity, thereby ensuring that there is sustainable stewardship across all forest areas. The development and implementation of effective management planning are essential for sustainable management within all of Bhutan's forests. Management

planning needs to be strengthened, both within existing designated forests and in areas where plans do not currently exist to support sustainable forest resource utilization, pest and disease control and GHG emissions reductions.

94. SRFL allotments are important for the social and economic benefit of the Bhutanese people. However, there is a recognition that the continuation of the allotment must be undertaken using a stewardship approach that reduces the negative impact on environmental services and biodiversity. Local communities are largely the end users, but in turn, their own future depends on sustainable management of their local natural resources. Therefore, communities have a critical participatory role to play with regards to stewardship, which is over and above rather than merely being beneficiaries or end users.

95. Effective monitoring and evaluation are critical in tracking the implementation of national policies and regulatory enforcement. Bhutan´s commitment to reducing GHG emissions requires an effective national forest monitoring system (NFMS) including specific Monitoring, Reporting & Verifications (MRV). For instance, the impacts of climate change may lead to increases in disease outbreaks; hence there is also a need for a multi-purpose NFMS to support detection of potential large-scale degradation of forests resulting from pest and disease.

Table 5 PAM 2 Target Actions

PAM 2 Target Actions
2.1 Develop and implement effective forest management plans in all SRFL.
2.2 Develop and provide tools for efficient management plan writing (guidelines, templates, software and applications).
2.3 Carry out functional zonation within the forest areas, demarcating forest production areas, watershed areas, wildlife habitats and recreational areas.
2.4 Implement of the already established Protected Areas Zonation Guidelines.
2.5 Strengthen the national forest monitoring system and MRV to keep track of forest cover changes and carbon stock.
2.6 Strengthen forest pest and disease management systems.
2.7 Establish reliable information and monitoring systems on demand, supply and utilization for rural and commercial timber requests.

Benefits and Risks

96. *Environmental Benefits:* Improved management of forests and watersheds through science-based planning and monitoring, will help ensure in the sustainable supply of natural resources. This will also lead to enhanced wildlife habitat, increased carbon sequestration and will limit soil erosion and reduce land degradation. The improved management of forests will increase the rate of natural water supply recharges, thereby improving water sources for multiple needs that include drinking, irrigation and hydropower generation.

97. *Social and Economic Benefits:* With better and sustainable forest management, livelihoods will be improved due to the increase in the availability of non-wood forest products (NWFP), increased employment opportunities and better agricultural yields due to faster replenishment rate of watersheds. Forest communities could be further empowered through improved management and decision-making capacity in community forests, potentially leading to improved social harmony within communities.

98. *Risks:* Failure to properly follow proposed management plans could lead to the introduction of exotic or invasive species to the area and increase the likelihood of fires, though the risks of these occurring were considered to be low. There may be possible elite capture of benefits within community groups and the proliferation of illegal timber sales and NWFP due to lack of effective enforcement.

4.3 PAM 3: Strengthen cross-sectoral land use planning and management, coordination & collaboration

Rationale

99. The projected allotment of SRFL for development of hydropower, road construction, agricultural expansion and power lines may result in significant deforestation and forest degradation unless there are adequate national planning processes. The preeminent law guiding land use is the Land Act, 2007. The Act defines the mode of decision-making on land use, allowing for subdivision and leasing and provides procedural guidance and conveyances. To date, there have been challenges in achieving strong cross-sectoral planning. Land allotment decisions are made at project levels with input from line ministries and approval by the local government or National Land Commission Secretariat (NLCS). The lack of an overarching long-term spatial planning policy means that decisions often occur in a piecemeal manner. There is an observable lack of adequate guidance, decision criteria, or accessible data and information, in order to align or mitigate regulatory and sectoral policy conflicts and reconcile trade-offs across different land use interests

PAM Objective

100. The objective of PAM 3 is to harmonize existing land use planning legislation and policies, by developing a national land strategic approach. This strategic approach will require the establishment of a common reference frame in the form of a national land use zoning system and geospatial management system. Land allotment based on national information and land use zoning system will encourage institutional decision-making with definitive land characterization and a better understanding of land use interests and trade-offs. The NLCS has already emphasized the need for clear policy and planning guidance, due to increasing trends in land use demands from the spread of urbanization and the impact of climate change. PAM 3 will ensure that land use planning is understandable, realistic, implemented, monitored and enforced.

101. PAM 3 will address some of the underlying drivers of deforestation and forest degradation, including governance challenges, policy and regulatory enforcement, as well as sectoral policy implementation conflicts. Investments will be focused on providing support to mainstream and implement integrated spatial planning and participatory land use planning.

Table 6 PAM 3 Target Actions

PAM 3 Target Actions
3.1 Review and harmonize policies and relevant documents relating to land use and planning.
3.2 Establish a monitoring and evaluation system on land use zoning and regulatory implementation.
3.3 Develop a harmonized national land use a strategic approach, through broad stakeholder consultation.
3.4 Develop and enforce the Zoning Ordinances and the Land Use Strategy through awareness raising, capacity building, and stakeholder engagement.
3.5 Strengthen the National Spatial Information System for land use zoning and improved data collection, processing, and validation.
3.6 Strengthen Land use planning and management

Benefits and Risks

102. *Environmental Benefits*: Harmonized land use planning should lead to the more efficient and effective utilization of natural resources. This, in turn, will enhance biodiversity and ecosystem services, such as improving the quality and quantity of water resources.

103. *Social and Economic Benefits*: Land use planning will improve law enforcement and will help alleviate land disputes. It will provide a guide to future infrastructure establishment and potentially lower development costs. Stronger institutional capacity at the Dzongkhag and Gewog levels could also result in better forest governance and a fairer sharing of benefits.

104. *Risks*: If environmental, social, and economic goals are not adequately balanced, there is a risk that environmental considerations will lose out when trade-off decisions are made. In addition, new land use planning policy at the national level may result in a reduced ability of local communities to influence forest planning.

4.4 PAM 4: Strengthen EIA processes for infrastructure proposals

Rationale

105. Bhutan has an environmental approvals system in place under the Environmental Assessment Act 2000. Assessments must be conducted prior to undertaking environmental clearances, such as those required in new infrastructure projects. However, broader impacts affecting forest environmental services are not included or adequately addressed. A significant challenge exists within the Environmental Impact Assessment (EIA) process, due to current disaggregation of the process for the different stages and components of a development project (e.g. roads, transmission lines and power plant facilities in hydropower).

106. The current approach to environmental clearances often requires input from a range of departments. The National Environment Protection Act 2007 (NEPA) is the umbrella

legislation that sets out requirements for the protection of the physical and ecological environment. However, there is a lack of clarity over government roles and responsibilities with regards to coordination across the monitoring and compliance processes. Furthermore, specific guidance on how to reconcile the interests of different sectors is weak.

PAM Objective

107. The implementation of this strategy will complement the procedural elements stipulated in the Environmental Assessment Act 2000, by enabling EIAs to be assessed holistically and detect future risks and impacts prior to implementation. The implementation of remediation measures would require a stricter monitoring and enforcement regime, as well as continuous revision of budget allocation practices and procurement processes. This will help achieve greater forest protection, including habitat restoration where impacts are unavoidable. This PAM will also assess options for providing offsetting or compensation from large infrastructure projects.

108. PAM 4 will improve the EIA process for infrastructure projects such as hydropower development and road construction. It will improve the guidance, information sharing, coordination and monitoring of the EIA process across all relevant government departments.

Table 7 PAM 4 Target Actions

PAM 4 Target Actions
4.1 Review and propose for revision of budget allocation practices, including procurement processes, in order to mitigate environmental damages from infrastructure development.
4.2 Evaluate the EIA guidelines and services from stakeholders' perspective to effectively implement the environmental rules and regulation by the third party.
4.3 Evaluate and strengthen the Forest clearance guidelines and modalities
4.4 Strengthen the institutional capacity for EIA and compliance monitoring system.
4.5 Ensure packaging of EIA for hydropower projects, including hydropower facilities, transmission lines, towers, and roads.

Benefits and Risks

109. *Environmental Benefits:* Strengthening the EIA system should result in an improved ability to target key environmental impacts and undertake comprehensive environmental monitoring of projects. These improvements, in turn, would encourage proponents to improve their overall environmental management, which will help minimize harm, protect biodiversity and reduce pollution of air, water and land.

110. *Social and Economic Benefits:* The EIA system would facilitate stakeholder coordination linkages and participation, with the community being well informed prior to consents being approved. The health and safety arrangements of projects may also be improved.

111. *Risks:* Changes to the EIA process could potentially introduce delays in project approvals and escalate project costs due to the inclusion of additional safeguards. However, international experience suggests that when project developers do a good job of

environmental design during the EIA process, there is less chance of environmental and social problems after projects have been implemented.

4.5 PAM 5: Achieve a highly diversified and technology-based timber supply chain

Rationale

112. There are performance inefficiencies across the timber supply chain (harvesting, transportation, storage, sawing, seasoning, manufacturing into finished products), particularly in downstream processes where there has been a limited introduction of new technology. Most sawmills have antiquated equipment with poor recovery and wastage, producing rough-cut sawn timber with limited grading and with average recovery rates of 60-70% depending on species and class of timber (Dhital 2009). Some guidance already exists on efficient harvesting and wood processing, but a critical gap lies in the implementation of these guidelines. Investment in the supply chain by the private sector has been very low, potentially due to uncertainty in the market and limited access to low-cost finance.

113. There is a lack of data and a coherent understanding of the current situation with regards to market supply and demand of timber throughout different parts of Bhutan. The combination of inefficiencies in the timber value chain, distribution, and narrow market focus means that in the future, there is the potential for an artificial wood deficit. The current forest supply chain is focused on softwood species and only a few preferred species of hardwood even though the dominant type is broadleaf, constituting approximately 50% of all Bhutan's forests (DoFPS 2016a; NEC 2016). Bhutan's wood processing industry has limited knowledge and infrastructure to season and process hardwood. There is also limited understanding of the market and barriers to utilization of the more readily available hardwoods, further resulting in limited investment by the private sector.

PAM Objective

114. PAM 5 seeks to develop integrated sustainable forestry and wood-based sector, which maximizes the use of every single tree that is harvested and thereby generates a more economic value per hectare of forestland. This will be achieved over a long-term planning horizon through the utilization of less preferred timber species, wood product diversification and value addition, expansion of market opportunities, investment in innovation and technology, reducing wastage and improvement of the operational efficiency and effectiveness throughout the supply chain.

115. There is currently a limited understanding of current and future market requirements for timber in different parts of the country. Therefore, wood flow and market analysis are necessary to understand resource availability, and domestic biomass flows adequately. The wood flow analysis represents a total resource assessment, including all wood products in all process steps from forest to final disposal. The market analysis would enable a better understanding of domestic biomass flows, competition between material and energy uses, and supply requirements of specific tree species from different parts of the country. Understanding current and projected demand from multiple societal needs and having readily accessible data on supply and demand is essential in making informed resource use and management decisions. This will include

a decision on requirements for specific types and locations of plantations, including those detailed under PAM 7.

116. The mobilization of the private sector via public-private partnerships will be essential. Capacity building, leveraging of finance investment in state-of-the-art wood harvesting and processing equipment will be required. This will entail improving guidance and information flows between different stakeholders including research institutions, government, investors, forest industry, wood-based industries, manufacturers and communities.

117. Innovation is an essential driver of economic progress, that benefits consumers, businesses, the government and the economy. The consolidation of existing initiatives throughout Bhutan's forestry and wood-based industries, through the establishment of a Forestry and Wood Innovation Hub, would provide an important mechanism for the development of the supply chain and adoption and investment in new technologies and products. For example, laminated glue timber (glulam) is a new type of structural engineered wood product comprising a number of layers of dimensioned lumber bonded together with durable, moisture-resistant structural adhesives. This product is currently being piloted but requires further investment and market testing. The National Resources Development Corporation Limited (NRDCL) will have a key role to play, recognizing the need to ensure that this PAM provides for both commercial mandates and the management of forest resources on a sustainable basis. NRDCL will be the Forestry and Wood Innovation Hub of integrated wood-based industries.

118. Forward commitment by all of the agencies in the Government to change its own procurement policy, including the use of less preferred hardwood timber, would send a strong market signal and create some certainty for industry. This would encourage a long-term view across the market, improving the wood industry's appetite towards less preferred species, as well as stimulating private sector investment and innovation. Leadership from the government in this area may also encourage the wider public to switch to these alternative timber species. A key determinant of this switch will be in the affordability of this timber.

Table 8 PAM 5 Target Actions

PAM 5 Target Actions
5.1 Undertake a wood flow and market analysis across the entire timber supply chain.
5.2 Establish a Forestry and Wood Innovation Hub of integrated wood-based industries under NRDCL.
5.3 Develop and increase the capacity of DoFPS, NRDCL and wood-based enterprises to operationalize improved approaches to timber harvesting, processing and value addition.
5.4 Promote the utilization of alternative less preferred timber species to reduce pressure on current high-value timber supplies through knowledge products and concepts.
5.5 Promote and diversify timber products and value addition through the provision of low-interest finance for small to medium enterprises.
5.6 Improve and disseminate efficient wood technologies (harvesting, processing, and recovery).
5.7 Set up pilot projects to improve value at different levels of the timber supply chain.
5.8 Pilot new technologies and tools in wood-based industries, wood seasoning and treatment and explore possibilities for providing subsidies for promotion of alternative timber and firewood.
5.9 Update government procurement policies and schedule of rates to show leadership in the use of less preferred timber species and alternative timber products.

Benefits and Risks

119. *Environmental Benefits:* The introduction of modern processing technology will result in the more efficient use of timber, thereby reducing the pressure on forests. Improved efficiency in harvesting and processing will allow the same volume of timber to be produced from a reduced number of harvested trees. The pressure on the currently preferred tree species and softwood forests will be reduced, through the promotion of alternative species that include hardwoods.

120. *Social and Economic Benefits:* The introduction of modern processing technology will result in the more efficient use of timber, reducing operational costs and minimizing waste. This could also result in the expanded use of currently underutilized secondary raw materials, such as stubble, leaves, resin, needles, and treetops. The expansion of product types should result in more jobs for local people, in both harvesting and wood processing. Timber quality and durability should increase through proper seasoning and treatment, increase the lifespan of materials and provide higher quality and more varied choices for consumers.

121. *Risks:* Depending on the initial investment costs of acquiring new technology, the successful implementation of this PAM may negatively affect small producers if measures are not introduced to help them with low-interest start-up finance. The introduction of modern technology may also lead to traditional practices no longer being undertaken. Improved harvesting and processing technology may open up the

previously inaccessible forest leading to reduction in biodiversity, and there may be an increase in illegal activities, particularly if timber is not affordable.

4.6 PAM 6: Adopt fire management approaches that limit impacts on the environment and communities

Rationale

122. Fire is recognized as one of the key drivers of forest degradation, and the need for protection of forest from fires is covered in the Forestry policies and regulations. Fires originate from many sources, and almost all are caused by humans, either intentionally or accidentally (NSSC 2014). Most fires occur between November and April when there are limited precipitation and persistent winds. This coincides with the time when farmers burn agricultural residues, which sometimes contributes to fire outbreaks. Western and eastern regions have historically experienced more fires than the southern and central regions. This may be the result of the forest types in these areas, with pine and oak forests being associated with high fuel loads during the dry season. The DoFPS is responsible for forest fire management with the help of local communities, armed forces, and volunteers. The country's rugged terrain makes fire control more difficult. With the Himalayas becoming warmer due to climate change, there is an increased risk of fires. A critical challenge continues to be the inadequacy of financial resources for fire management.

PAM Objective

123. PAM 6 aims to reduce the risk of forest fires, thereby avoiding degradation of forests and GHG emissions, as well as limiting risks to human properties. This will involve strengthening fire management and response capacity, providing support to existing regulatory measures, such as those in the Forest and Nature Conservation Rules and Regulations of Bhutan 2017 (FNCRR) and Forest Fire Management Strategy 2013.

124. The development of fire management planning guidelines, monitoring, and fire hazard maps will be of strategic importance in planning for more effective fire responses. Enhanced knowledge and capacity building, at both government and community levels, will be required for fire prevention and control. This may include silvicultural manipulation of forest stands, controlled burning, and other management practices.

125. These capacity building provisions need to be supported by consistent and regular funding and investment in fire early warning systems and firefighting equipment. The regions and forest types experiencing the highest incidences of fire should be prioritized in this regard. The responsibilities for the implementation of fire management operations need to be better coordinated, with clear measures in place for timely responses. Acknowledging that some fires will occur irrespectively of the provision of prevention and response measures, it is important to ensure that there are post-fire actions in place, such as replanting of trees by communities.

Table 9 PAM 6 Target Actions

PAM 6 Target Actions
6.1 Establish fire early warning systems, including communication tools and approaches to ensure that threats to communities are reduced and responses to fires are prompt.
6.2 Explore and implement new and innovative forest fire management in the Country.
6.3 Strengthen forest fire management planning guidelines, including forest fire management such as control/prescribed burning, fuel load reduction and replanting.
6.4 Carry out survey and mapping of forest fire prone areas (fire hazard map).
6.5 Institute, upscale and operationalize forest fire management groups at all levels (village/ gewog/ dzongkhag/ national).
6.6 Procure improved modern firefighting equipment and technology (Drone, helicopter etc).
6.7 Carry out capacity building on forest fire prevention techniques at the institutional and community level.

Benefits and Risks

126. *Environmental Benefits:* Loss of tree specifies can reduce emissions. The composition of forests will improve, as lack of disturbance will result in a natural balance of age, species, and growth rates. While habitat may be improved through some controlled burning, habitat and biodiversity loss from uncontrolled fires will be reduced. Furthermore, soil erosion and threats from landslides may be minimized, and the aesthetic and beauty of the overall landscape will be enhanced.

127. *Social Benefits:* There may be a reduction in forest fore risk and threats to life and property. New local jobs may be created for fire managers, and there may be improved community coordination and participation in managing fires.

128. *Risks:* It is possible that burnt land from controlled fires could be exposed to colonization by exotic species. Controlled burning could also lead to the extermination of fire-sensitive species and reduction in plants for grazing.

4.7 PAM 7: Establish plantations to provide sustainable wood-based products supply, increase carbon-stock, and enhance biodiversity

Rationale

129. Infrastructure development and the continuing demand for timber from increasing construction and wood-based industries will create increasing pressure on forests and watersheds. Anecdotally it appears that there are logistical and timber transportation cost challenges in some parts of the country in matching supply and demand in timber, exacerbated by the high market preference for softwood tree species and few broadleaved species. This focus on timber production also relates to the fact that the total forest area deemed suitable for quality timber production is low. It is estimated that only 17% of forested land has the potential to be managed as FMUs and WSs for commercial timber production (WMD 2015).

130. Human-wildlife conflict is a major problem in some rural parts of Bhutan. Conflicts are likely to be higher in settlement areas where there has been deforestation, habitat loss and degradation (Distefano 2005). These conflicts can have social and economic impacts, as well as threaten the population viability of wildlife. Records show that 55% of crop damage can be attributed to damage from wildlife (NEC 2016).

131. The demand for firewood is variable, with some regions experiencing a surplus of fuel wood, while others have a deficit. Despite many people using stoves for heating and cooking, the use of energy efficient stoves is not widespread. The widespread availability of electricity may mean a reduction in the demand for firewood in future, although this will depend on cultural requirements and costs to households.

PAM Objective

132. The main objective of PAM 7 is to address the increasing timber demand and improve carbon emission reductions potential. This PAM contributes to the 12th FYP's aim of developing an additional 2000 to 5000 ha of plantations. PAM 7 will also have a number of co-benefits that include protecting watersheds, soil conservation, establishing additional livelihood opportunities, recreational areas and in providing more sources of firewood. These plantations will provide additional habitat and food sources for wildlife contributing to the reduction of human-wildlife conflict in agricultural areas.

133. The establishment of the Forestry and Wood Innovation Hub and the promotion of less prefererred timber species in PAM 5 will be a key complementary measure to the establishment of a plantation programme. The wood flow and market analysis outlined under PAM 5 will enable evidence-based decision making on requirements for specific types and locations of plantations. The basic premise is that plantation development locations should be prioritized, in line with the land zoning proposed under PAM 3. Establishing plantations in degraded areas would be a productive and beneficial use from ecological, social, and economic points of view. As Bhutan has different ecological regimes and local conditions vary from place to place, the type and purpose of each plantation will need to be carefully assessed.

134. This plantation program requires technical expertise, enhanced capacity and investment. Partnerships will be established across government, public sector institutions, the private timber sector, financial organizations and communities. PAM 7 will support the government, state-owned enterprises, and the private sector, by providing technical expertise, capacity development and monitoring tools. The National Forest Policy 2011 has provisions for plantation development to be outsourced. Accordingly, DoFPS has also developed a guideline for outsourcing plantation and nursery activities. REDD+ will support DoFPS and relevant agencies to build additional capacity and support to implement plantation programs across the country. Private sector investments and finance mechanisms will need to be mobilized, and landowners engaged, in order to establish long-term commitments for establishing sustainable plantations.

Table 10 PAM 7 Target Actions

PAM 7 Target Actions
7.1. Establish a Public-Private Joint Plantation and Nursery Development Program.
7.2 Establish 5 000 hectares of new plantations across a range of different ecological regimes for climate mitigation, livelihood development (eg. mushroom billet plantation), wildlife habitat enrichment, watershed and soil conservation, recreation etc.
7.3 Implement plantation development norms and standards to promote multi-purpose plantations and species in different ecological and climatic zones.
7.4 Build capacity of the private sector and provide guidelines, tools for plantation development and management.
7.5 Implement monitoring and evaluation guidelines and tools, capacity building, and conducting ongoing monitoring and evaluation management and control of invasive species.

Benefits and Risks

135. *Environmental Benefits:* Plantation development will reduce the pressure on standing native forests and natural tree stocks. The promotion of the native species could result in an enhancement of ecosystem services, as the re-establishment of trees on barren areas would minimize land degradation and potential erosion, as well as improving water catchment areas.

136. *Social and Economic Benefits:* There may be improved income opportunities for local communities, leading to higher living standards and increased GDP from the forestry sector. There would be an increase in accessibility of timber and fuelwood for local communities, and water sources would be protected.

137. *Risks:* Environmental problems, such as the spread of invasive species, forest pests and disease outbreaks could eventuate if plantations are not properly managed. The establishment of plantations may increase competition for land, "crowding out" existing local forest users. This may lead to the displacement of existing land uses to other areas of natural forest, which would result in further degradation and deforestation. There are risks that new plantations may be established on current areas of land, which already have high value for food, resources and wildlife, such as wetlands.

4.8 PAM 8: Promote the development of enterprises that sustainably manage NWFP

Rationale

138. NWFPs harvesting and traditional uses of the forests are important part of Bhutanese culture and peoples' livelihoods. The enduring benefits from NWFPs depend on how well forests are managed. The ability for communities to access resources and markets are key components. An underlying assumption is that communities will conserve and protect forest resources if they receive tangible benefits from sustainable forest utilization. The challenge Bhutan faces in relation to NWFPs relates to the effectiveness of technical support and guidance to rural communities and marginalized groups because of limited financial resources. Capacity building for NWFP enterprises has only

taken place on a small scale, and there are no designated funds for NWFP based enterprise development.

PAM Objective

139. The National Strategy for the Development of NWFPs 2008-2018 identified a priority list that includes a range of wild mushrooms, bamboos, canes, medicinal plants, natural dyes, vegetables, food crops, spices and other plants. There are currently over 800 community forests and 140 NWFP management groups. These networks facilitate a range of community-based programs and activities, which provide a platform to share expertise, build capacity and help in the marketing of products. A significant number of groups have the potential to produce products for sale. REDD+ will support and continue building on this progress, by strengthening supply chains, increasing value from products and accelerating the commercialization and domestication of NWFPs. Understanding the requirements for support and guidance will entail an assessment of existing bylaws, regulations and capacity for promoting domestication, management and trading of NWFP.

140. The objective of this PAM is to enhance community livelihoods through the development of enterprises and the sustainable management of NWFPs. This will be achieved through the development of markets, enhanced capacity building, dissemination of guidelines and the incorporation of objectives for NWFP in management plans.

Table 11 PAM 8 Target Actions

PAM 8 Target Actions
8.1 Build capacity of the Communities and develop product guidelines to create a broader understanding of sustainable management, harvesting, and the supply chain of NWFP.
8.2 Incorporate objectives and actions for the sustainable management of NWFPs in management plans (community forest, watershed, protected areas, and FMU management plans).
8.3 Develop micro, small and medium scale rural NWFP enterprises for domestic and international markets and also networking

Benefits and Risks

141. *Environmental Benefits:* Sustainable management of NWFP will enhance the sustainability of NWFP harvesting, will reduce pressure on natural resources and habitats, helping to protect biodiversity and the conservation of soil and water.

142. *Social Benefits:* The promotion of NWFP enterprises should result in increased livelihood opportunities, reducing the rural-urban migration by providing local people with active engagement and a fairer distribution of benefits from forests. It may facilitate community empowerment, decision-making, and entrepreneurship in relation to NWFP. Widespread participation and equality can be promoted, as NWFP involves activities for both genders and a range of ages. Traditional knowledge can also be preserved, through the use of NWFP in medicines and other uses.

143. *Risks:* If effective guidelines, management objectives, monitoring and enforcement are not implemented, then the expansion of NWFP enterprises could result in increased access and exploitation. This may result in increases in human-wildlife conflict, the introduction of exotic and invasive species, pest and disease outbreaks, habitat fragmentation, higher levels of pollution and waste. Expansion of NWFP could benefit large enterprises at the expense of traditional small-scale operators. It may also divert interest away from mainstream agriculture and reduce grazing areas for livestock.

4.9 PAM 9: Broaden opportunities for income generation from ecosystem services

Rationale

144. Ecosystems provide various goods and services to society, which in turn directly contribute to the well-being and economic wealth (Costanza *et al.* 1997). Examples of ecosystem services include provisioning food, resources and water, regulating floods, soil erosion and disease outbreaks, supporting nutrient cycles and oxygen production, and non-material cultural benefits such as recreational and spiritual well-being.

145. Benefits from ecosystems for the regulation of key functions, which are often unaccounted in traditional economics. The actual economic value of ecosystem services in Bhutan is estimated to range between USD 465 million to 1.234 billion per year, but the potential is much higher (WMD 2018). An ecosystem valuation carried in 2013 estimated that the potential value of ecosystems in Bhutan was approximately USD 15.5 billion per year (Kubiszewski *et al.* 2013). Provisioning services represent the highest value, as nature provides Bhutanese people with inputs for food, timber, water and electricity in amounts that range from USD 355 million to 1 billion per year. Ranging between USD 77 million and 216 million per year, cultural and recreation services also play a significant and increasing role in generating wealth in the country. Much of this is driven by the tourism sector and the flows of investments that support the efforts to conserve and protect natural habitats and biodiversity. Approximately 29% of all tourist visits are nature-based.

146. In the assessments, forests contribute the most out of all land cover types, making up a substantial part of the value either directly or indirectly. The estimates of regulating services show that forests importance can be higher than the existing contribution of timber to the economy. But to realize the actual potential from ecosystem services, decisive actions and activities are needed to enhance the benefits from these functions in the long term. The provision of such services might require communities to undertake or even to restrain from certain activities.

147. Household and community opportunities for income generation from ecosystems services have been limited. Payments for Ecosystem Services (PES) is enabled by a range of national policies, including the National Forest Policy 2011 and FNCRR 2017. In Bhutan, there are some existing PES schemes that have the potential to be scaled up across the country, while also taking into account experience from international schemes. These include the Yakpugang Community Forest Management Group's scheme for water source protection, and similar schemes in Bhurkhay Community Forest under Chukha Dzongkhag and Namay Nichu Community Forest under Paro Dzongkhag.

PAM Objective

148. The objective of PAM 9 is to develop schemes to incentivize communities to actively participate in natural resources management. This will be achieved by assessing and demonstrating opportunities for income generation from payment for ecosystem services and better accounting for environmental services. Working in tandem, PES and ecotourism have the potential to be cost-effective means to improve environmental management and provide alternative livelihoods to local communities.

149. PES provides opportunities to reward communities for their efforts in providing ecosystem services, such as watershed protection and soil stabilization. But to realize that potential, further scoping is required to determine the long-term operationalization of these schemes. Ecotourism and craft manufacturing schemes have significant potential for providing alternative livelihoods for forest communities, as well as increasing the flow of funds to support biodiversity and habitat conservation efforts. Tourist numbers are growing, with many people visiting Bhutan due to the country's cultural activities, nature, ecology and adventure (TCB 2016).

150. This PAM will support national efforts to improve accounting for environmental services through frameworks such as triple bottom line (TBL) reporting. The aim is to ensure institutional business reporting include social, environmental and financial components, allowing for the evaluation of performance, investment and operational decisions. Due to their inherent value across all components, PES schemes provide many triple bottom line benefits. TBL could be used to good effect in Bhutan and the mainstreaming of this approach, through capacity development, should be encouraged across all government institutions, as a prerequisite for promotion into the private sector.

Table 12 PAM 9 Target Actions

PAM 9 Target Actions
9.1 Encourage and promote eco-tourism/ community-based ecotourism (eco-trails, bird watching, fly-fishing, hot springs, rafting, experiential tourism, agro-ecotourism and visitor study).
9.2 Develop exclusive eco-tourism products which are unique to each Dzongkhag or area.
9.3 Develop framework & guidelines for development and management of ecotourism products.
9.4 Train communities on manufacturing and product diversification.
9.5 Carry out scoping and operationalize further potential PES schemes.
9.6 Support capacity building for triple-bottom line accounting.

Benefits and Risks

151. *Environmental Benefits:* Encouraging PES could provide strong incentives to local communities to improve the protection of forests, water sources and other habitats. PES could increase the levels of finance available for environmental conservation.

152. *Social Benefits:* Investment may increase, leading to improved services and infrastructure and increased employment opportunities. Developing PES may lead to a

change of mindset towards conservation, diversification of income sources and the development of new skills for local people.

153. *Risks:* Increased numbers of eco-tourists may lead to local pollution and forest degradation, due to waste generated by tourists and increased fuel demand. Ecotourism may increase competition for traditional land uses, resulting in community displacement and inequality in access to resources.

4.10 PAM 10: Develop climate smart approaches in agriculture

Rationale

154. Bhutan aims to ensure that people have access to safe and adequate nutritious food. Climate change is likely to pose major threats and risks to farming communities, increasing the need for using different coping strategies to adapt to the change. Crop failure may become more problematic as a result of climate change, through the increased intensity of droughts and floods at certain times of the year. Bhutan's livestock and crop management practices have not yet developed adequate strategies for climate resilience. Bhutan's geography and the small size of individual farms create significant challenges in improving agricultural production. Although solutions are available, adoption of new practices is limited because of lack of knowledge and limited access to markets.

155. Livestock husbandry is an important part of rural livelihood, particularly for subsistence farmers. Traditionally livestock freely grazes and find fodder in forests, a low-cost practice known as *tsamdro.* These practices can impact the quality of forests by compacting soil, browsing trees seedlings and inhibiting natural regeneration. However, the impacts are extremely localized, and the number of large herds is reported to be slightly declining (NEC 2016). In recent years there have been government initiatives to improve productivity and promote improvements to dairy production.

PAM Objective

156. PAM 10 will focus of Climate-Smart Agriculture (CSA) promoting farming systems that improve per unit productivity and promote diversification to secure and increase alternative incomes through activities such as crop diversification, agroforestry, intercropping, greenhouse farming, advanced irrigation systems, organic farming etc. and thereby reduce pressure on the forests. CSA is an approach that aims to transform agricultural systems in order to address food security, sustain livelihoods and encourage prosperity, adapt and build resilience to climate change risks (e.g. droughts and floods) and where possible to remove greenhouse gases. This PAM will build on previous work in Bhutan through the Commercial Agriculture and Resilient Livelihoods Enhancement Programme, which is being undertaken in eastern provinces, as well as contributing to measures outlined in the Land Act (2007) and the Food and Nutrition Security Policy (2014), which outline adaptation and mitigation measures to address climate and environmental impacts.

157. REDD+ will support existing work undertaken by the Ministry of Agriculture and Forests (MoAF) to improve livestock productivity, through the introduction of high yielding cattle, improved grazing land management practices and fodder production. This will improve the feed-to-food conversion efficiency in animal production systems, as well as

reducing the environmental footprint of livestock. PAM 10 will establish up-front financing mechanisms to help households invest and shift from subsistence to commercial livestock production systems, as well as encouraging farm diversification, including the development of piggeries and fish farms. REDD+ investment will further target development and promotion of sustainable agricultural practices, including investment in low impact irrigation systems and integration of sustainable soil and land management technologies and approaches. Promotion of high-value crops is an effective way to reduce pressure and demand for more land, thereby reducing the need for forest encroachment, as farmers are able to earn more income per unit area.

158. This PAM will strengthen the supply chain and provide marketing support. The establishment of farmer field schools, farmer cooperative groups, and enterprises will help improve all aspects of the supply chain, from production, harvesting, crop drying, storage, value-addition processing, distribution, branding and marketing. Cooperative groups will increase the ability for individual households to access finance as well as selling their goods, by enhancing negotiation power and improving access to markets. Cooperatives will be provided with technical support and education through farmer field schools to improve all aspects of the supply chain while limiting impacts on the environment. Efforts will be required to ensure that women and other vulnerable groups are able to overcome barriers that may limit their participation.

Table 13 PAM 10 Target Actions

PAM 10 Target Actions
10.1 Promote agroforestry practices for promoting fodder trees and pasture development.
10.2 Promote high yielding cattle and a shift to semi-commercial/commercial dairy farming.
10.3 Integrate fishponds and piggery development.
10.4 Encourage integrated farm systems that include organic agriculture, low-impact irrigation, pest management, and soil conservation.
10.5 Promote the cultivation of high value, nutrition dense and climate-resilient crops.
10.6 Support farmers through supply chain development and the formation of farmer groups and cooperatives.

Benefits and Risks

159. *Environmental Benefits:* These approaches will improve the productivity of land and resources, thereby reducing the expansion of agriculture into forests. The approach will also encourage the management of water resources, and help reduce erosion, runoff and siltation in watersheds. *C*limate smart practices will help reduce the impact of grazing in forests, and smaller high-value herds may reduce greenhouse gas emissions.

160. *Social Benefits:* There may be an improvement in employment and income generation opportunities, due to increased productivity, a wider range of crops, and the higher prices that organic products can attain. Farmers will gain increased knowledge through capacity development. Conflicts over water use will be reduced.

161. *Risks:* These approaches may lead to the development of monocultures in tree species as a result of less seed dispersal via free-ranging livestock. Traditional farming systems

may be lost, and conventional farmers may be excluded due to lack of technical expertise. There may be some forest degradation as the result of infrastructure development, such as irrigation channels. There may also be restrictions on wildlife movements due to fencing.

5 FEASIBILITY ASSESSMENT OF STRATEGY OPTIONS

162. The feasibility analysis conveys how REDD+ and the Strategy Options fit into the context of the national economic development framework. The aim is to understand the implications on existing policies and institutional establishments, including how the NRS addresses deforestation and forest degradation as well as builds on the existing policies, regulatory measures and institutional settings.

163. The NRS must have a positive net effect in its contribution to Bhutan´s climate change response and adaptive capacity. The feasibility and the cost-benefit analysis build on the prior analysis undertaken for strategy preparation, specifically from the situational assessment of existing shortcomings affecting drivers of deforestation and forest degradation.

164. The cost-benefit analysis offers an overview of the implementation costs of Strategy Options based on an indicative approach. The results of the feasibility assessment support and guide the prioritization of the Strategy Options and PAMs as well as articulating the following:

a. **Regulatory and Policy Framework**: Assessment of the interaction and coherence of the Strategy Options and relevant policies, legislation and regulations.

b. **Costs of implementation**: Calculation of the net present value of the implementation of the PAMs with baseline funding and reference benefits or impacts.

c. **Institutional Analysis**: An analysis and identification of the institutions that would be involved in the implementation of REDD+ to ensure roles and responsibilities are well aligned, as well as having the necessary capacity.

5.1 Regulatory and Policy Framework

165. The regulatory and policy setting in Bhutan presents a conducive and complimentary setting for successful implementation of REDD+. The basis of Bhutan’s commitment to sustainable forest management stems from the Constitution, which directs every Bhutanese person, as a trustee of the Kingdom’s natural resources, to contribute to the protection of the natural environment and to the conservation of the rich biodiversity of Bhutan. The Government is directed to protect, conserve and improve the pristine environment and safeguard the biodiversity of the country; prevent pollution and ecological degradation; secure ecologically balanced sustainable development, while promoting justifiable economic and social development; and ensure a safe and healthy environment. The Government is further directed to ensure that in order to conserve the country’s natural resources and to prevent degradation of the ecosystem, a minimum of 60% of Bhutan’s total land shall be maintained under forest cover in perpetuity.

166. The analytical work undertaken through the national REDD+ process has presented the opportunity to assess the effectiveness of the regulatory and policy framework for sustainable natural resource management. Prioritizing which legislative vehicle is suitable to promote REDD+ objectives is important. Sectors need to prepare strategies to mainstream climate into their plans and to guide activities. While climate adaptation and mitigation are clearly defined in Bhutan's NDC, the existing sectoral and development policies have not yet been amended to reflect this priority. Table 14 summarizes the policies, legislation and regulations that are relevant to this strategy, with full details provided in an accompanying report (Bhutan REDD+ Strategy Feasibility and Cost Benefit Analysis Report; WMD 2019).

Table 14 Summary of Relevant Policies, Legislations and Regulations

Policy	Summary Details	Interaction with the NRS
Gross National Happiness	Bhutan's unique development philosophy.	Need to consider indicators that measure the health of ecosystems, including a robust information management system. All four Strategic Options Support GNH.
National Environment Strategy (1998)	"The Middle Path" recognizes the need to develop the economy, while still maintaining the country's rich cultural heritage, traditional values and the natural resource base.	NRS is consistent with the objectives in the NES. All four Strategic Options Support the NES.
Bhutan 2020	Sets national aspirations and reaffirms GNH as a central development concept for the country.	NRS supports the concept that environmental conservation is at the core of development planning.
National Environmental Protection Act of Bhutan (2007)	Umbrella legislation for environmental management and sets roles & responsibility of key agencies.	The Act does not mention climate change explicitly, but the framework encompasses considerations for addressing forest degradation.
Environmental Assessment Act of Bhutan (2000)	Stipulates that environmental clearance is a prerequisite for development consent and sets out the environmental terms for project requirements.	The analytical work under REDD+ has confirmed sentiments expressed by communities and many stakeholders regarding the environmental impact of the energy sector.
Land Act (2007)	The preeminent law is guiding land use and allows for leasing and allotment of SRFL.	Natural resources rights and land tenure are quite clear, making the country relatively unique in the context of REDD+. Though no

		definition for carbon rights and no zoning of the land.
Economic Development Policy (2016)	Promotion of the Five Jewels, sectors that constitute core growth areas: hydropower; cottage and small industries; mining; tourism; and agriculture.	States that the NLC shall prepare a national land use plan (zoning). Informed land use planning can address the critical drivers of deforestation and develop necessary mitigation measures to reduce pressure on forests.
National Forest Policy (2011)	Defines the goal of sustainable management of forest resources and biodiversity to produce a range of social, economic and environmental goods and services.	While the NFP mentions climate mitigation and adaptation, it does not provide guidance on how to pursue this in relation to other priorities.
Forest and Nature Conservation Act (1995)	Provides the primary authority for forestry activities in the country and framework for conservation and sustainable management.	FNCA is key in maintaining 60% forest cover and recognizes the traditional and cultural rights of local people to access and use forest resources.
Water Act of Bhutan (2011)	Along with the early Water Policy (2007), this Act seeks an integrated approach for effective management of water resources.	References climate change, and the need to find a balance between the needs of water management and the demands of water users.

5.2 Potential Barriers to REDD+

167. Bhutan has established an integrated and transparent planning framework for economic development, under the guidance of the GNHC. Forest sector governance is generally strong. The 2015 corruption risk assessment shows that Bhutan experiences low levels of corruption (DoFPS 2015); hence, corruption is not likely to be a barrier to both the implementation and success of REDD+.

168. One of the main challenges that face the forestry sector is that existing policies and regulatory implementation arrangements are not adequately effective, resulting in some level of unsustainable forest use. For example, in reference to the timber allotment system, the policy provides all rural citizens with access to highly subsidized timber for residential purposes (subsidized rural timber). However, there are two main areas of concern, which relate to:

   a. Access to timber and forests for rural communities (the price difference between subsidized and allotted timber may provide incentives for people to illegally divert subsidized timber for commercial purposes).

   b. Forests offences, including illegal logging.

169. Weaknesses in monitoring, oversight and enforcement need to be addressed through a combination of increased verification of timber usage by households, more regular

audits of sawmills and increased monitoring of transit permits for transporting timber. The major barrier is the limitation in reliable information or a historical digitized database of requests and approvals of rural timber at the Gewog level.

170. The main issues identified as barriers to REDD+, therefore, relate to:

a. Government agencies are pursuing development in sectoral approaches, placing competing pressure on the land, but without the most effective means to identify how the plans and programs of one sector will affect that of others.

b. A lack of comprehensive and effective guidance across government institutions regarding addressing land use change.

c. A lack of spatial information available to government intuitions when addressing land use change, including subdivision.

171. Lack of funding is the inherent potential barrier, and it is the intention of this strategy to mobilize resources to support existing efforts. The DoFPS has historically focused its efforts on strengthening management quality, including equity in benefit sharing. While the idea of community forestry is well supported within Bhutan, active participation is declining in some areas due to how benefits and costs are shared. While there are inevitably some isolated problems of misuse and profiteering from resources allocated at a subsidized cost, overall the problems are limited in scale and frequency. The corruption risk assessment highlights that some governance weaknesses could become more problematic over time, such as those related to democratic representation. In these cases, there is the prospect of "elite capture", where decision making is dominated by a powerful minority. The persistence of these conflicts of interest and the resulting unfair distribution require adequate safeguards to be put in place in the planning phase. Otherwise, they could become significant barriers to REDD+ implementation.

172. There is an opportunity to improve the effectiveness through the REDD+ window to address governance challenges in community management of forests, by paying specific attention to the issues of equity and gender imbalance, reviewing the guidelines in the Community Forestry Manual, and focusing on capacity building for Community Forest Management Groups (CFMGs).

5.3 Cost-Benefit Analysis

173. There are costs associated with implementing REDD+ interventions, and they can be defined as the costs and investments required to implement the NRS and avoid or minimize displacement of emissions to other regions or sectors (leakage), (World Bank 2016a). Therefore, it is necessary to determine the cost and benefits that are likely to accrue from implementing the NRS. Such an analysis enables an understanding of the level of fund mobilization and benefit sharing. For this strategy, a cost benefit analysis (CBA) was undertaken in which each of the PAMs was evaluated for costs and benefits generated over a period of 20 years. Because of the subjectivity and incomplete data, the overall cost of implementing a national REDD+ framework shall be determined by the ability to mobilize resources, both domestic and international.

174. The results of the CBA supported and guided the prioritization of the Strategy Options and PAMs for implementation from the point of view of the most effective use of funds.

The proposed budget for each PAM is derived from various sources and assumed to have a certain level of emission reduction potential and socio-economic benefits. The CBA was undertaken in an iterative manner, starting with a model that allowed the comparability. Each PAM was initially allocated an implementation budget of USD 1 million as a minimum. The allocation of funds is then assumed to lead to impacts on reducing forest degradation or deforestation and to lead to increased incomes depending on the PAMs. The funds can be interpreted as scalable budget figures and the impacts as targets for the projects. As such the modelling provided a basis for the overall budget allocation presented for each PAM, hence, the CBA should be treated as part of the broader suite of guidance including expert knowledge used to determine the overall budget estimate for implementing the NRS as presented in the Action Plan (Annex 1).

175. The CBA provides a net present value (NPV), which is often used as an indicator for financial viability. However, it should be noted that in the case of some policy measures, financial viability analysis does not accurately reflect the long-term benefit and impacts on the economy, and this is one weakness of a CBA. The CBA uses baseline ecosystems services factors derived from country-specific and some global literature, plus expert advice to calculate the social and economic net present value, as well as the carbon emission reduction potential of each PAM. Where no relevant literature or data is available, appropriate assumptions were drawn in consultation with different experts. A list of key factors and assumptions is present in Annex 2, and more detail is presented in the CBA full report accompanying this strategy document. The impacts of the PAMs over time are assumed to take place during a 20-year period following a linear function between the current state to the assumed future state at year 20. In addition to a normal time preference discount rate used by private companies and individuals (assumed here at 15%), the analysis uses a social discount rate (SDR) calculated according to Valentim & Prado (2008). The equation for calculating the SDR is adjusted to Bhutan in line with the 1.3% population growth and 6.6% annual per capita GDP growth (World Bank 2016b; 2016c). The SDR is set to 8.36%.

176. The four Strategy Options and proposed intervention actions are highly relevant and respond to the identified drivers and underlying causes of deforestation. Quantitative and qualitative analysis shows that a combination of regulatory and institutional strengthening would have a greater impact on reducing deforestation and forest degradation. As noted, Bhutan has a wide range of suitable policies and opportunities, but enforcement and financial capacity have been significant barriers to effectiveness.

177. The combined results of the CBA, economic valuation and climate change mitigation potential show that the four Strategy Options will enable Bhutan to address the direct and indirect drivers of deforestation and forest degradation while contributing to national economic development agenda. With regards to the ten PAMs, the range of net present values and climate change mitigation potential show that there is need to take a balanced investment approach to draw maximum returns and benefits (social, environmental and economic). Table 15 outlines the social and economic NPVs, internal rate of return (IRR) and emission reduction potential for each PAM. The negative NPVs illustrate the complex nature of implementing policy projects that require long term monitoring and evaluation to determine the actual impact. However, almost all PAMs have reasonable IRR.

Table 15 Estimated Financial Indicators and Emission Reductions Potential

PAM	Net Present Value (Social; USD)	Net Present Value (Economic; USD)	Internal Rate of Return	Emission Reductions Potential
1	-2 682 679	-2 472 405	N/A	0
2	4 301 723	1 860 762	39%	2 780 709
3	1 955 180	-23 936	15%	2 730 423
4	106 176	-441 601	9%	819 127
5	7 213 067	2 230 116	23%	2 317 257
6	-1 299 026	-1 831 511	3%	1 139 025
7	-13 149 537	-9 746 562	N/A	123 750
8	4 104 635	1 775 128	37%	171 417
9	97 222	-487 780	9%	65 930
10	291 425	-1 875 422	9%	142 612

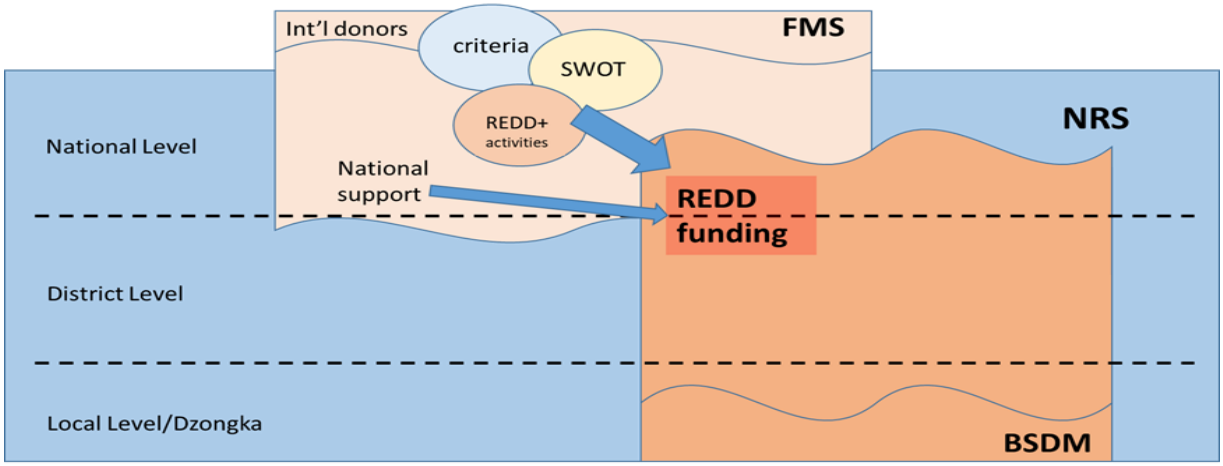
178. In this feasibility, assessment funding is treated as an inherent gap, but the basic assumption is that some funding will be available under general national fiscal planning and regulatory and policy reform and improvement can still be achieved under annual institutional work plans. The fund mobilization framework entails assessing both domestic and external sources of funding to support relevant thematic areas of REDD+ as defined under Bhutan´s Readiness Preparation Proposal.

5.4 REDD+ Financing

179. The objectives are to develop a financial vehicle designed to drive the implementation of the NRS, through which the required international funding will be raised, and financial allocations will be coordinated. Bhutan already has the basic underlying structure to coordinate the various sources of climate finance for the country, but additional capacity is necessary to streamline programme implementation and management and ensure that compliance with social and environmental safeguards. REDD+ financing is closely linked to the priority actions and benefit sharing, as illustrated in Figure 9.

180. Training will be conducted for public and private sector actors on REDD+ and climate-smart approaches to land management to enhance awareness and disseminate information on sustainable investment opportunities. The aim is to identify private sector companies that are willing to make sustainable investments in climate-smart forestry and agriculture. Such companies will need to commit to strengthening the linkages to sustainable value chains, ultimately supporting the transition to low emission and climate-resilient land use practices

Figure 9 REDD+ Fund Structure



181. Financing of REDD+ interventions will require consideration of various modalities. Accompanying this strategy document is a REDD+ fund mobilization framework, which maps out the climate finance landscape, options, opportunities and links with the benefit-sharing framework. Three options for funding REDD+ include development grants with national co-financing, loans and RBP. A number of development partners have supported the REDD+ readiness process, including the World Bank FCPF, GIZ and UN-REDD (UNDP, FAO, UNEP) among others. Bhutan has also been able to access other funds such as the Least Developed Country Fund in the past, but with its graduation into a middle-income country, Bhutan will no longer be eligible.

182. An optimal scenario that fits the domestic fiscal setting is to seek international grants (direct programme or project-based funding for REDD+) that can be complemented with domestic financing, or co-financing and leveraging on other international projects. The Green Climate Fund (GCF) is an important opportunity.

183. The RGoB further plans to encourage and create the necessary enabling conditions for increasing the participation of the private sector in supporting national efforts to mitigate the impacts of climate change. Policy measures to promote diversification and efficiency in the wood value chain present an important opportunity to promote broader private sector participation and investment in climate smart technologies. There are further opportunities for Public Private Partnerships that will be considered in larger investment programmes.

184. An option for working with multilateral development banks such as WB, IFC and ADB will be considered with the leadership of the GNHC and Ministry of Finance. In this respect, RGoB can play a pivotal role in helping the private sector in acquiring low-interest finance for activities that fall under the umbrella of the NRS.

185. This strategy is based on the premise that is protecting Bhutan´s landcover and climate proofing the economy is a strategic and more economic approach when compared to the restoration challenge faced by countries that have experienced decades of deforestation. It is acknowledged that Bhutan´s opportunities for results-based carbon payments are limited due to the net carbon sink position, as illustrated in the emissions profile. However, Bhutan is unique and exemplary, providing important lessons for other counties on how effective protection and sustainable resource management can yield greater benefits. Table 16 outlines the estimated budget for operationalizing this

NRS based on a combination of expert consultation, cost modelling, emission reductions potential and potential monetary benefits. A detailed Action Plan is provided in Annex 1.

Table 16 Strategy Option Budget Estimate

Enabling PAMs	Estimate Cost (USD)	Direct Intervention PAMs	Estimate Cost (USD)
PAM 1 Developing institutional and sectoral capacity building to achieve sustainable forest management	3 000 000	PAM 5 Achieving a highly diversified and technology-based timber supply chain	5 800 000
PAM 2 Strengthening the effectiveness of existing policies and methods across all forestry jurisdictions and areas	1 670 000	PAM 6 Adopting fire management approaches that limit impacts on the environment and communities	5 000 000
PAM 3 Strengthened cross-sectoral planning and coordination	4 600 000	PAM 7 Establish plantations to provide sustainable wood products supply, increase carbon-stock, and enhance biodiversity	21 600 000
PAM 4 Harmonized EIA process to ensure infrastructure proposals are assessed and monitored as a package	1 600 000	PAM 8 Promoting the development of enterprises that sustainably manage NWFPs	1 075 000
		PAM 9 Broadening opportunities for income generation from ecosystem services	2 250 000
		PAM 10 Develop climate smart approaches in agriculture	8 000 000
Total Estimate	10 870 000		43 725 000
Grand Total, USD	**54 595 000**		

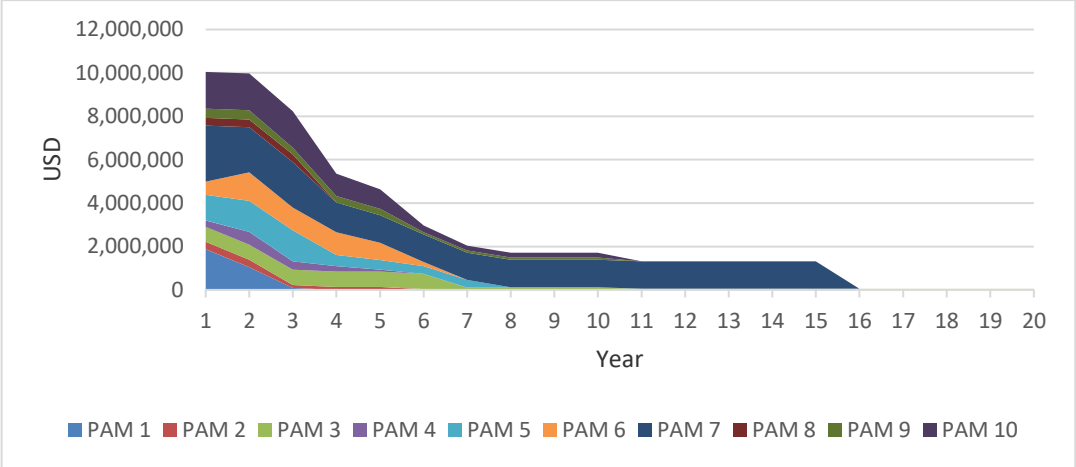
186. The carbon benefit response testing with the budget allocation for each PAM in Table 16, the estimated carbon impact and income from carbon revenues that Bhutan might be able to receive are presented in Table 17. An increase in budget would also not necessary result in a linear increase in carbon revenue. However, an increase in the budget towards interventions that improve the effectiveness of PAMs would result in greater socio-economic benefits. These models assume that the projects carried out would reduce forest degradation and deforestation against a baseline, in which they would remain as they are as identified in Bhutan's Drivers of Deforestation study and proposed FREL & FRL. The results of this analysis are based on simplified models that consider the main features of the PAMs. Therefore, they should be treated as indicators only supporting the notion that Bhutan´s emission reductions, the potential is limited in order of magnitude, but the investment is necessary to realize the socio-economic benefits that contribute to the overall national economic development.

Table 17 Climate Change Mitigation Potential of Each PAM

PAM	Potential Total CO2e impact (tons)	Average CO2e impact per year (tons)	Potential Net Income from Carbon (USD5.1/ton)
1	0	0	0
2	2 780 709	139 035	13 656 613
3	2 730 423	136 521	13 400 158
4	819 127	40 956	3 652 547
5	2 317 257	115 863	11 293 011
6	1 139 025	56 951	5 284 029
7	123 750	6 188	106 125
8	171 417	8 571	349 225
9	65 930	3 296	-188 760
10	142 612	7 131	202 322

187. Figure 10 illustrates the level of required investment over time. The first five years require high levels of investment tapering as REDD+ becomes mainstreamed in national planning and policy process and the financing burden reducing substantially.

Figure 10 Budget Allocations for the PAMs over 20 Years



188. Accompanying this NRS is a fund mobilization strategy providing an overview of both domestic and international funding opportunities. The next step in resource mobilization will involve the implementation of a REDD+ investment and implementation plan summarized in Table 18.

Table 18 Fund Investment and Implementation Plan

Fund Investment and Implementation Plan	
Overall objectives	• Mobilize funding to achieve REDD+ national objectives and to strengthen Bhutan´s participation in global climate change efforts • Finance the implementation of REDD+ investment plans through REDD+ programmes • Promote political dialogue associated with the REDD+ process • Use a milestone-based framework and support the development of national instruments to measure, report and verify, in an ongoing and transparent manner, investment results, in accordance with UNFCCC guidelines • Increase the Government's coordination capacity for rapid, consistent and effective implementation
Special objectives	To develop a financial vehicle designed to drive the implementation of the NRS and through which the required international funding will be raised, and financial allocations will be coordinated. Additionally, to set up a basic underlying structure to coordinate the various sources of climate finance for the country, whilst ensuring streamlined management of the programme that complies with social and environmental safeguards
Aim	The Investment and Implementation Plan aims at attracting and guiding the allocation of international and national funding sources for the implementation of the country's REDD+ strategy, as well as guiding the allocation of other necessary investments.

Elements of the Plan	• Objectives • Proposed activities (from NRS) • Eligible donor prospecting • Output-based action plan • Filling identified gaps (from FMS) • Inventory of domestic funding opportunities • Analysis of cross-sectoral initiatives and synergy • Time-bound steps

5.5 Benefit Sharing Framework

189. Aside from contributing to generating emission reductions, the REDD+ program will bring about monetary and non-monetary benefits, which need to be distributed across a wide range of beneficiaries. A Benefit Sharing Mechanism (BSM) report has been produced, which outlines options to ensure fair and equitable sharing of benefits to stakeholders involved in the implementation of REDD+ activities (DoFPS 2018). Benefit sharing creates effective incentives by rewarding individuals, communities, organizations and businesses for actions that change unsustainable land-use practices and reduces emissions and builds a wider legitimacy and support for the REDD+ mechanism.

190. The REDD+ Benefit Sharing Framework proposed is based on the existing institutional setting involving GNHC and the Ministry of Finance with an additional proposal to nominate a host for an independent National REDD+ Fund. The host of the National REDD+ Fund will be responsible for management of international funds received as results-based payments but may also be responsible for domestic funds specifically earmarked for REDD+ performance-based.

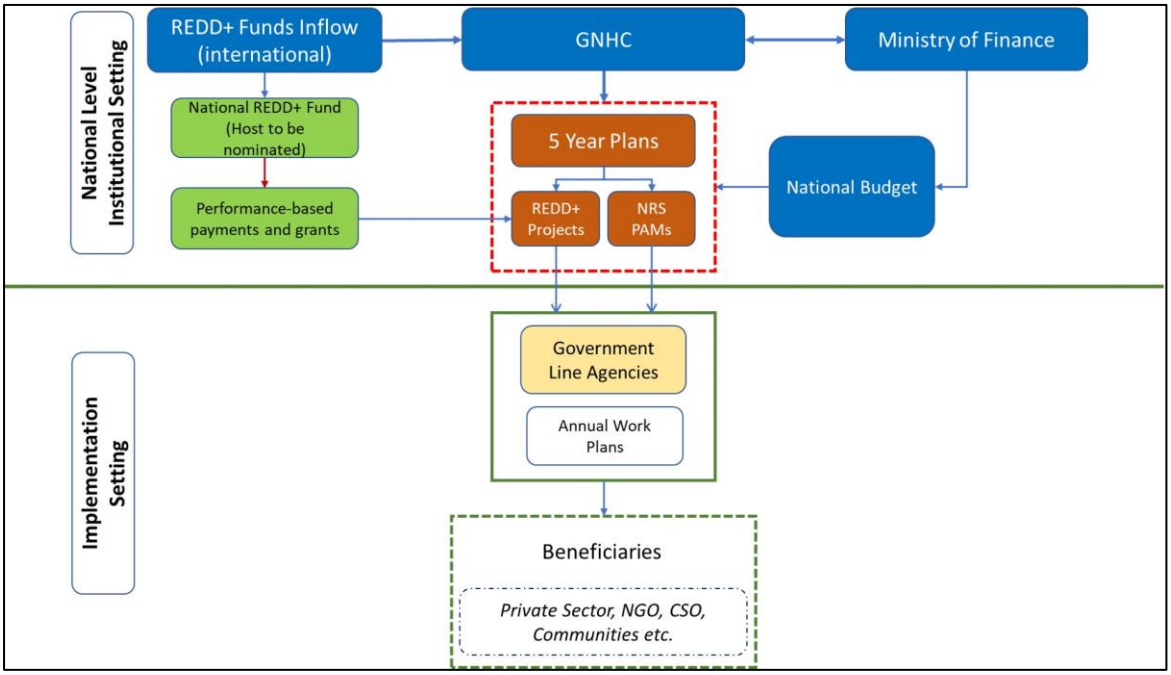
191. The framework presented in this NRS is based on two scenarios – fund approach and project approach. In each approach, there will be specific types of beneficiaries and benefit rationale. Benefits under this framework will include both monetary and non-monetary benefits and include benefits that are achieved after some period of implementation (ex-post); as well as upfront benefits (ex-ante) to enable the REDD+ interventions. This framework is based on the tenet that the greater proportion of REDD+ financing in Bhutan will come from international sources, with some domestic finance and limited if any volume from RBP.

192. Figure 11 illustrates the proposed institutional setting for REDD+ funds management. This setting means that funding inflow from international sources is mobilized through GNHC and channelled into a REDD+ window within the Ministry of Finance, from where funding can be allocated in line with the FYP and NRS PAMs Action Plan for all institutions that hold roles and responsibilities for REDD+ implementation. The Ministry of Finance (MoF) is the financial arm of the government, and hence as a permanent institution has the required capacity and systems in place to administer relatively large funds. The mainstreaming of REDD+ into the National Five-Year plans will mean no separate process is required for fund allocation and monitoring and evaluation.

193. At the sub-national level, the PAMs will be implemented through annual work plans as part of the FYP. Each year, based on the terms and agreements with institutions

responsible for implementing activities outlined in the Action Plan, each institution will receive a budget allocation to implement the annual plan. The budgets will include the costs of implementation of PAM activities, including required funding to cover activities of the local authorities (i.e. based on the facilitation and cost rationales for benefit sharing). A part of the work plan budget may be triggered as a performance-based conditionality. For example, based on the development of forest management or carrying out functional zonation within the forest areas, demarcating forest production areas, watershed areas, wildlife habitats and recreational areas.

Figure 11 Framework for Benefit Sharing



194. With respect to setting up the National REDD+ Fund, the Bhutan Trust Fund for Environmental Conservation (BTFEC) is considered as a possible option considering its longstanding history and experience in fund management and projects implementation, since its establishment in 1992. Having been established as a collaborative venture between the Royal Government of Bhutan, United Nations Development Programme (UNDP), and World Wildlife Fund (WWF), an endowment of USD 20 million was set up as an innovative mechanism to finance conservation programmes. BFTEC already has well set out governance structures. The framework for using the fund is already in place through Article III, Section 3.0 of the Royal Charter of BTFEC 1996 which states that "Capital of the Trust Fund shall be constituted by contributions/grants from donor, countries/organizations and shall consist the principal and investment income." In addition, BTFEC is recognized as a National Implementing Entity (NIE) of the Adaptation Fund and meets all UNFCCC safeguards requirements.

CATEGORIES OF BENEFICIARIES, ELIGIBILITY, TYPES AND SCALE OF MONETARY AND NON-MONETARY BENEFITS

195. In Bhutan, key principles of benefit sharing: effectiveness, efficiency, and equitable sharing already exist through the GNH principle. The benefit-sharing rationales to be employed in the NRS include:

- The facilitation rationale, (recognizing the role government institutions in administering policies, laws and regulations, monitoring and evaluation to facilitate effective REDD+).
- The hotspot priority rationale (recognizing priority watersheds, for instance).
- Legal rights rationale (recognizing the need to strengthen areas outside FMUs, watershed areas and private forests and PES).
- The cost rationale (recognizing the need to modernize the wood value chain to increase diversification through investment and to increase adoption of climate-smart primary production).
- Carbon stock enhancement and emission reductions rationale.

196. With regards to benefits, non-monetary benefits will comprise gains from the implementation of the four enabling PAMs and will specifically include improved capacity for sustainable forest management, improved forest governance and improved land use planning. Monetary Benefits come from several sources and include increased, and additional income from wood value chain product diversification; receipts from PES schemes; opportunity cost compensation for loss of profitable land uses foregone; funding for activities that store carbon or relieve pressure on forests such as NWFP; increased revenue for farmers due to higher yields in agriculture. Table 19 summarizes the beneficiary categories and rationale that will be applied during the implementation of all PAM activities.

Table 19 Beneficiary Category and Benefit Sharing Rationale

Potential beneficiary type	Basis of benefit sharing	The rationale for benefit sharing
Communities (Geog, Throm) with priority for REDD+	Performance of forest protection and restoration and enhancement (e.g. conformity with management plans and land use zoning/plans.) Labour, time and opportunity cost input	Carbon stock enhancement and emission reductions rationale Cost rationale
Investors / Businesses	Performance of forest activities (afforestation, restoration, etc.)	Emissions reduction rationale Cost rationale
Ministries/Departments Dzongkhags/Dungkhags	Performance of forest protection and restoration, plan implementation (i.e. NFMS/MRV results for REDD+) Costs for executing and coordinating the REDD+ implementation	Facilitation rationale Cost rationale

(DoFPS, NRDCL, WMD, NLC, NEC etc)		
Subnational offices, Community	Performance of forest protection and restoration (i.e. monitoring results for Dzongkhags, Dungkhags and Gewong) Costs for executing and coordinating forest management plans	Facilitation rationale Cost rationale
Communities, individual households	Performance of forest protection and restoration (i.e. monitoring results for the district) Costs for executing and coordinating management plans and other interventions and implementation at the community level	Facilitation rationale Cost rationale

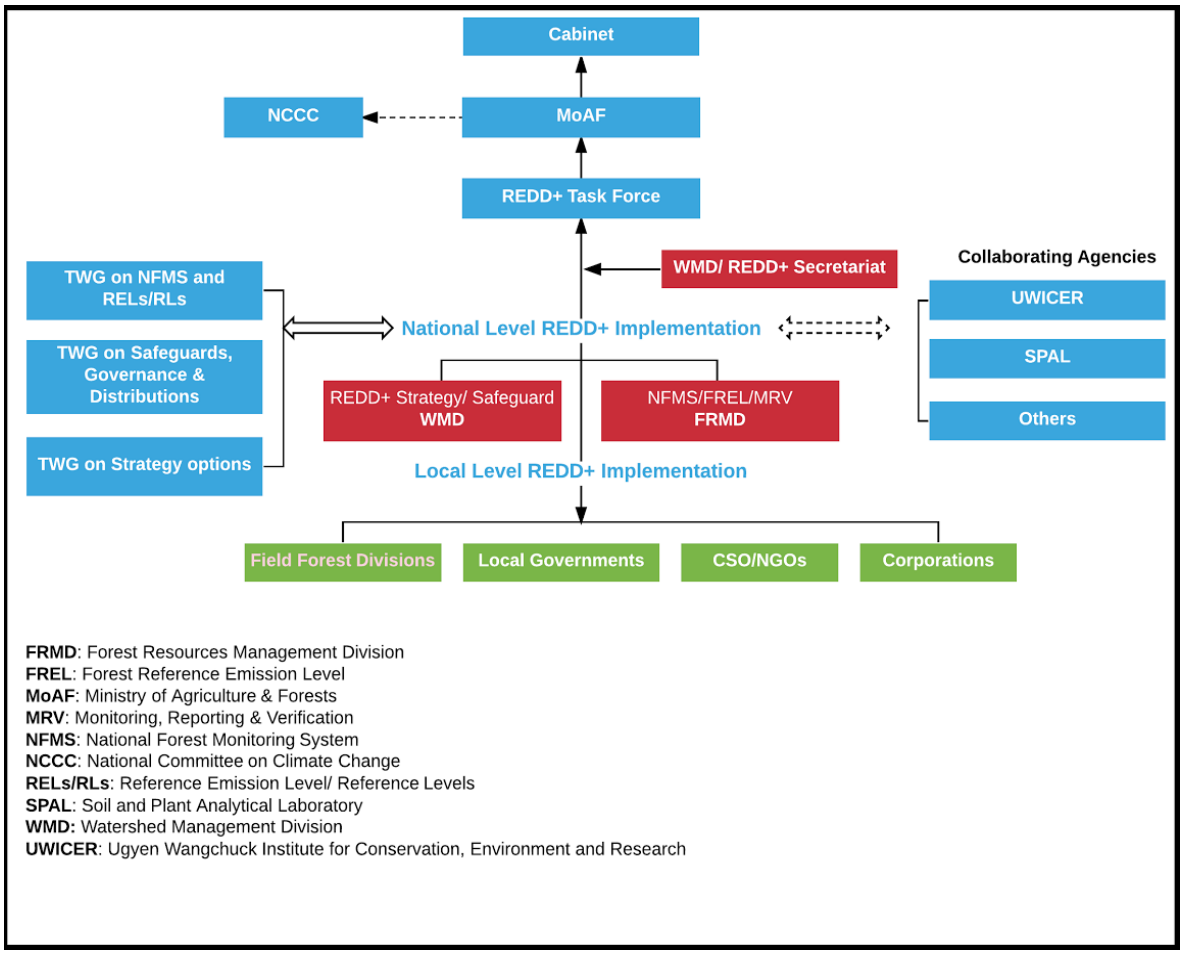
6 STRATEGY IMPLEMENTATION

6.1 Institutional Arrangements and Coordination

197. The REDD+ readiness process established project level implementation structure within existing institutional structures. A REDD+ Task Force supported by technical working (1) National Forest Monitoring System & Reference Emission Level; (2) Safeguards, Governance and Benefit Distribution and (3) Strategy Options were set up to lead the development of this Strategy. Technical Working Groups established to focus on the operational level and provide technical inputs for the implementation of each thematic area.

198. The design of this NRS is such that for each PAMs, a lead agency is nominated in line with its institutional responsibility. Associated activities will be led by the specified department in close collaboration with other relevant government departments or institutions. The implementation of this NRS does not necessarily require separate institutional structures. Activities or projects will be implemented within relevant departments following normal project or program implementation framework and best practice. The commitment to implement this NRS entails an ongoing commitment to maintaining the relevant support structure established during the REDD+ readiness phase. Figure 12 represents the coordination setting established during the readiness phase and will be sustained for the foreseeable future.

Figure 12 Institutional Setting



199. At the implementation level, the agencies that will be involved in the NRS are listed in Table 20, some of which have already played important roles in the REDD+ Readiness process and will continue to build on the existing institutional roles to facilitate the implementation of the NRS.

Table 20 Agencies to be involved in the REDD+ Process

Agencies	Role in REDD+ Readiness
Gross National Happiness Commission Secretariat	Ensure REDD+ programs are in line with government plans and policies
National Land Commission Secretariat	Cadastral data, advice and guidance on land use change and land tenure
National Environment Commission Secretariat	GHG reporting, National Communication, UNFCCC Focal Point with a secretariat – with sectoral technical committees.
Ministry of Agriculture and Forests	Coordinate and implement REDD+ program
Ministry of Economic Affairs	Land clearance system, represented in the Technical working group, ensure harmonization of their policies with that of REDD+ vision
Ministry of Foreign Affairs	Represent Bhutan at government level in all international negotiations
Ministry of Finance	Facilitate budget availability for REDD+ implementation
Ministry of Home and Cultural Affairs Department of Local Government, Dzongkhag Administration, Geog Administration	Represented in REDD+ Task Force, REDD+ committee at the local level facilitates disseminating information to local communities
Non-Governmental Organizations and Civil Society Organizations Royal Society for Protection of Nature Bhutan Trust Fund for Environmental Conservation National Commission for Women and Children Tarayana Foundation	Represented in REDD+ Task Force, Technical Working Groups and provide recommendations on relevant issues and assist the Government in REDD+ Readiness and implementation
Natural Resources Development Corporation Ltd.	Represented in the Technical Working Groups and recommendations on relevant issues and assist the Government in REDD+ Readiness implementation
Royal University of Bhutan	Represented in Technical Working Groups and contribute to research and studies, advocacy, etc

6.2 Monitoring and Evaluation

200. REDD+ monitoring will be integrated into existing national frameworks. The GNHCS monitors the implementation of plans and programmes at the national level through annual status monitoring of the NKRAs and corresponding KPIs as well as the mid-term review of the five-year plans. The implementation of the five-year plans is monitored through the national M&E system (Single System). The preparation of this NRS coincides with the commencement of the 12th FYP and will continue into the 13th FYP. Under the 12th FYP, all agencies and local governments shall ensure that cross-cutting themes such

as Environment, Disaster Management, Gender, Vulnerable Groups and Sports are mainstreamed in the programmes and projects.

201. Therefore, no separate monitoring framework shall be developed for REDD+ as reporting on REDD+ is now inherent within the National Key Result Areas, Key Performance Indicators, and Agency Key Result Areas in the 12th FYP and will continue into the 13th FYP. The Local Development Planning Manual will help the Local Governments in terms of tools and techniques to mainstream or integrate cross-cutting issues and opportunities in plans and programmes. However, to support REDD+ specific monitoring and reporting, substantive frameworks have been established during the R-PP implementation and are described in the next sections.

6.3 National Forest Monitoring System

202. An Action Plan for Bhutan´s National Forest Monitoring System (NFMS-AP) for REDD+ was developed in 2015 by FRMD and WMD with support from FAO through UN-REDD. The Action Plan sets out the actions to be taken towards the implementation of the NFMS for REDD+ under the UNFCCC. The overall framework constituting the National Forest Monitoring System (NFMS) include forest monitoring, setting the FREL/FRL (baseline) and MRV of emission reductions from sources and carbon removals from sinks as well as the safeguards information system. The NFMS is designed to provide information relevant to MRV REDD+ activities and to support broader forest sector policies and programs.

203. The Action Plan conceptualizes institutional arrangements for MRV with two main objectives:

a. To monitor the health and state of Bhutan's forests for enabling long-term conservation and sustainable forest management and uphold the Constitutional requirements of maintaining 60% forest cover in perpetuity.

b. To generate accurate and holistic data on forest area and carbon stock changes in a transparent and consistent manner, using globally accepted methodologies for national and international reporting.

204. A well-advanced NFMS is already in place encompassing the NFI, Satellite Land Monitoring System and GHG-I for LULUCF, FRELs/FRLs. The Action Plan outlines roles and responsibilities for various institutions taking the lead on different components the NFMS as follows;

- The DoFPS for the SLMS and NFI.
- The NECS for the national GHG-I for the LULUCF sector, and for compiling and reporting the national communication to UNFCCC. Specific QC processes will be integrated into the processes, as set out by the IPCC, and an overall QA assessment will be carried out by an independent third party. Under these arrangements' activity data, emission factors, and GHG emissions data should be shared between the involved institutions to maximize transparency and openness.

205. The FRMD leads the coordination, development and implementation of the NFMS including carrying out periodic NFI, LULC and Forest Information & Resource Management System, etc. NFI implementation is guided by an advisory team comprised

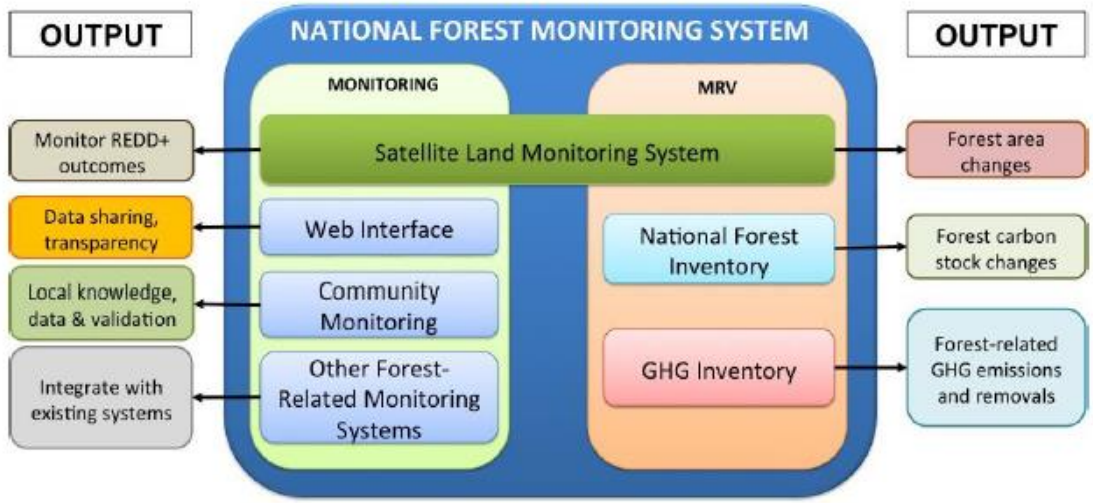
of staff from the Renewable Natural Resources Research Development Centre (RNR-RDC), the National Soil Service Centre (NSSC), National Biodiversity Centre (NBC), the NECS, and the Royal Society for the Protection of Nature (RSPN). This arrangement enables broad-based stakeholder participation in NFI design and implementation.

206. The NFMS-AP outlines the target structure for the MRV and Monitoring functions (Figure 13). The MRV function is for reporting GHG inventories and is divided into three elements: Measurement, Reporting and Verification. The measurement part consists of GHG Inventories, the Satellite Land Monitoring System (SLMS) and the NFI. This structure already incorporates a multi-sectoral approach specifically in streamlining geospatial activities, data standardization, and sharing with an established common geoportal (Bhutan GeoSpatial Portal). A Centre for GIS Coordination (CGISC) was established where a wide range of agencies using geospatial tools are represented. The CGISC has a range of mandates including

207. The CGISC has a range of mandates including

a. Functions as the Secretariat for the National GIS Coordination Committee.
b. Maintains the National repository for GIS data.
c. Provides and Mobilize technical backstopping to GIS users.
d. Promote dissemination of geospatial data.
e. Organize regular National GIS Coordination Committee.

Figure 13 NFMS Structure



6.4 Forest Reference Emission Level and Forest Reference Level

Baseline

208. Bhutan has a proposed national level FREL & FRL in pursuant to the Decision 12/CP.17 with a historical reference period of 2005-2014. This historical period is further divided into two contiguous periods (2005-2009, 2010-2014) based on the FCPF CF Methodological Framework 2016 and available datasets. The FREL & FRL covers the

following REDD+ activities (emissions from degradation are accounted for under SFM and conservation):

- Deforestation.
- Sustainable management of the forest.
- Conservation of forest carbon stock.
- Enhancement of forest carbon stock.

6.5 Social and Environmental Impacts

209. The RGoB fully acknowledges that social and environmental safeguards are critical to helping ensure that planned activities are successful as well as to reduce conflict, optimize benefits, and help ensure that activities do not result in unintentional harm to people or ecosystems. The country already has a set of legislation aimed to minimize or mitigate, harm to people and the environment, and at the same time to bring the most benefit from development activities, including REDD+, to people of all ethnic groups throughout the country. National policies, laws and regulations that are explicitly and some cases implicitly reflect social and environmental safeguards already exist.

210. The development of SESA is informed by an analysis of Bhutan's existing safeguard policies and regulations along with relevant World Bank safeguards policies in a manner that confirms the execution of REDD+ activities are in accordance with UNFCCC (Cancun elements) guidelines. Bhutan has completed a Strategic Environmental and Social Assessment to identify potential adverse impacts and risks of NRS implementation and ensure coherence with the relevant World Bank safeguards operational policies. Bhutan has now completed the development of These instruments include a SESA for its NRS and an ESMF to reduce the potential environmental and social risks and enhance the benefits of REDD+ implementation. These safeguard documents will provide clear directions for managing and mitigating the environmental and social risks and impacts of future investments (projects, activities, and/or policies and regulations) associated with the implementation of the country's REDD+ strategy.

211. The strategic level of SESA was implemented at the national level. Upstream analytical work combined with robust consultations with key and relevant stakeholders were conducted, with the aim of identifying the social, environmental and gender issues, risks and impacts related to the NRS. The SESA process ensured that social, environmental and gender concerns would be integrated into the development and implementation process of the NRS and key interventions areas. Consultations were conducted using the community engagement approach used by a number of World Bank-financed projects supporting natural resource management in Bhutan, and a platform for participation of relevant stakeholders to integrate social environmental and gender concerns related to REDD+ implementation. Furthermore, recommendations were made on how to address gaps in relevant policy, legal frameworks, and institutional capacity to manage risks/impacts.

212. As required by the World Bank, the RGoB must produce an ESMF as a direct output of the SESA process. The ESMF lays out principles, rules, guidelines and procedures for assessing issues and impacts associated with planned REDD+ PAMs that may occur in the future but are not presently known or are uncertain. t largely provides a framework

for the country to address environmental and social issues in the NRS as it is implemented. Bhutan's ESMF outlines:

- the safeguard obligations that need to be complied with during REDD+ implementation to meet RGoB's objectives (i.e. the safeguard relevant obligations identified in Bhutan's PLRs and the relevant development partner requirements (for example, World Bank, GCF, IFC)
- the Management Framework that needs to be adopted to manage the risks identified in the SESA.
- roles and responsibilities for ensuring safeguards compliance, including guidance and overseeing implementation, grievance resolution, and monitoring and reporting

6.6 Feedback and Grievance Redress Mechanism

213. Bhutan is designing a Feedback and Grievance Redress Mechanism (FGRM), which is one of the critical requirements for the REDD+ implementation. The Feedback ensures effective engagement of communities and other interests and would serve to improve the planning and implementation of REDD+ towards preventing potentially adverse impacts on project-affected communities. FGRMs are intended to complement, not replace, formal legal channels for managing grievances. These mechanisms are not intended to replace the judiciary or other forms of legal recourse. FGRMs act as recourse for situations in which, despite proactive stakeholder engagement, some stakeholders have a concern about the organization's actual or potential impacts on them (FCPP and UN-REDD 2015).

214. Potential issues that the FGRM may have to deal with include:

- Allegations of non-compliance with safeguards and standards;
- Financial, fiduciary and benefit sharing disputes;
- Land tenure and customary rights;
- Rights to carbon;
- Participation and free, prior and informed consent;
- Access to information; and
- Adequacy and the independence of reporting from project implementers and local, provincial and national governments including on information provided to the SIS.

215. Conflicts may result from project activities. They will be resolved following a grievance mechanism that is based on the following key fundamentals:

- Rights and interests of impacted people, communities', workers and others associated with or impacted by the project are protected.
- Concerns of project participants arising from the project implementation process are adequately addressed and in a prompt and timely manner.
- Entitlements or livelihood support for project participants are provided on time and in accordance with the Government and World Bank safeguard policies.

- Project participants are aware of their rights to access grievance procedures free of charge.
- The grievance mechanism should be in line with existing policies, strategies, and regulations on grievances as defined by RGoB, which require project owners/developers to set up grievance mechanisms starting from the village level.

6.7 Safeguard Information System

216. This NRS is accompanied by a SIS. The development of an SIS is a key requirement for parties under the UNFCCC and is linked to the delivery of results-based payments for REDD+. Based on the globally adopted Cancun Safeguards, the SIS sets out a system for providing information on how the safeguards are addressed and respected throughout the implementation of REDD+ actions, with a view to protecting the program against risks, while promoting its benefits beyond climate change mitigation. Reliable safeguards information is important not only for achieving REDD+ in a sustainable manner but can also serve possible broader sustainable development and other national policy, goals (as well as other international reporting obligations). The SIS further provides information that is accessible by all relevant stakeholders

217. Bhutan's SIS is be based on the harmonization of existing reporting systems at the national, sub-national and local levels which will allow for the collection and provision of integrated information. It also draws in guidelines such as the Carbon Methodological Framework which requires countries to promote the UNFCCC REDD+ safeguards as per Decision 1/CP.16.

218. Necessary support structures reflecting the existing legal, institutional and compliance frameworks in the country are adopted in order to ensure compliance with the safeguards. The functions of the SIS are closely linked to the institutional arrangements, as the functions may be carried out by a single, or multiple agencies/institutions. Core functions considered by Bhutan are:

- **Collection**: a process of collecting raw data through information systems and sources (reporting template).
- **Aggregation**: a process of aggregating, into a central repository/database, the information provided by the relevant sources and systems for the purpose of analysis.
- **Analysis**: a process of undertaking assessment (qualitative and quantitative) of the information in order to determine to what extent the safeguards are being addressed and respected.
- **Dissemination of information**: a process of disseminating, both internally (national level) and externally (international reporting) through appropriate means (e.g. website, reports, meetings with relevant stakeholders).

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8 ANNEXES

8.1 Annex 1: REDD+ Action Plan

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 1: Strengthen institutional and sectoral capacity to achieve sustainable forest management							
1.1 Undertake a capacity needs assessment for REDD+ implementation and develop a Capacity Development Strategy and Plan	An understanding of capacity requirements and current levels for REDD+. Entry at institutional and organizational levels, with functional and technical capacity examined (skills, knowledge, systems, infrastructure).	Comprehensive understanding of the required capacities; assessment of current capacity; identification of gaps; capacity strategy and plan.	Capacity Needs Assessment & Capacity Development Strategy and Plan, undertaken by **mid of YEAR 1**	75 000			
1.2 Institutional capacity building and support in developing and implementation of management plans for Forest Management Unit (FMUs), Protected Areas,	All relevant government departments and Community Forest Management Groups have the necessary capacity to effectively develop and	Roles, responsibilities and coordination mechanisms established in order to have the necessary capacity to sustainable manage forests.	Coordination mechanism and capacity development programmes established by the **end of YEAR 1**	750 000			

Community Forests, areas outside FMUs, watershed areas and private forests.	implement forest management plans.																							
1.3 Capacity building and strengthening National Forest Monitoring Systems (National Forest Inventory, Land and Land Cover Monitoring, MRV for REDD+).	Sub-national institutional set-up and capacity strengthened; investment in IT infrastructure for NFMS; multi-purpose regional monitoring stations established.	Number of regional monitoring stations; quality and frequency of sub-national data collection, and integration into a national data-set.	At least 5 Functional fully equipped Monitoring Offices established in 5 priority regions, by the **end of YEAR 2**.	1 925 000																				
1.4 Capacity building in silvicultural practices, pest and disease management to improve forest productivity through technical training.	Knowledge and capacity of forestry staff are enhanced to improve forest productivity.	Net primary production of productive forest stands.	At least 60 technical staff trained from the public sector and at least 60 technical experts trained from the private sector, by the **end of YEAR 3**.	250 000																				

Lead agency: DoFPS	**TOTAL PAM BUDGET**	**3 000 000**

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 2: Strengthen the effectiveness of existing policies and approaches across all forestry jurisdictions and areas							
2.1 Develop and implement effective forest management plans in all SFRL.	Improved implementation of management plans.	Number and quality of management plans implementation compared to current practices.	At least, by the **end of YEAR 6**: - 5 Watershed management plans (priority watersheds) - 10 forest management plans - 20 FMU plans	500 000			
2.2 Develop and provide tools for efficient management plan writing (templates, software and applications).	Improved quality of management plans.	Number and quality of management plans implementation compared to current practices.	Computer-based templates and approaches devised for management plans, by the **end of YEAR 2**	100 000			
2.3 Carry out functional zonation within the forest areas,	Improved quality and implementation of management plans.	Number and quality of management plans	Zonation maps for forest completed by **end of YEAR 2**.	150 000			

demarcating forest production areas, watershed areas, wildlife habitats, and recreational areas.		implementation compared to current practices.			
2.4 Implementation of the already established Protected Areas Zonation Guidelines.	Updated Protected Areas Zonation guidelines.	Zonation guidelines reflect requirements in the law.	Zonation guidelines updated by the **end of YEAR 3**.	150 000	
2.5 Strengthening national forest monitoring system to monitor forest cover changes and carbon stock.	Improved national forest monitoring system, and implementation of monitoring and evaluation.	Effective MRV that produces high-quality, reliable forestry data, including forest carbon estimates.	Fully equipped National Forest Monitoring Unit up and running by the **end of YEAR 5**. *Procurement:* IT infrastructure, servers, laptops, satellite image processing software etc.	500 000	
2.6 Pest and disease	Improved understanding of how	Number of management	Pest and disease sections in all new	20 000	

management and monitoring incorporated into all forest management planning.	to manage pests and disease.	plans that incorporate pest and disease management.	management plans **end of YEAR 6.**		
2.7 Establish reliable information and monitoring systems on demand and supply for rural and commercial timber requests.	Effective monitoring of rural/commercial timber utilization; Sustainable tree felling that matches demand.	Reduction in breaches of Forest and Nature Conservation Rules and Regulations of Bhutan 2017.	A Functional National Timber Request and Approval Information System with 5-10 adequately trained staff by **end of YEAR 6.** Procurement: Database, Server, Laptops, Printers.	250 000	
Lead Agency: DoFPS			**TOTAL PAM BUDGET**	**1 670 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 3: Strengthen cross-sectoral land use planning and coordination							
3.1 Review of policies related to land use, such as Land Act 2007, FNCA, EDP 2017, PSMP 2040, Road Master Plan 2027, Transmission Master Plan.	Existing policies on land use reviewed.	Policies: all Acts and plans are in harmony.	All policies reviewed and harmonized by the **end of YEAR 6**.	400 000			
3.2 Establishing a monitoring and evaluation system on land zoning and regulatory implementation.	Monitoring and evaluation conducted on zoning and regulatory compliance.	Policies: all Acts and plans are in harmony.	Monitoring system established by the **end of YEAR 5**; ongoing implementation.	300 000			
3.3 Development of a harmonized national land use	National Land Use Strategy developed.	National Land Use Strategy	National lands use strategy approved	400 000			

strategy, through broad stakeholder consultation.		approved and in action.	by the **end of YEAR 5**.		
3.4 Development and enforcement of Zoning Ordinances and Land Use Strategy through awareness raising, capacity building and stakeholder engagement.	Zoning Ordinances and Land Use Strategy developed and enforced.	Zoning Ordinances and Land Use Strategy enforcement records.	Capacity on land zoning undertaken in **end of YEAR 5** departments by year **end of YEAR 5**; 50% of gewogs sensitized in forest law enforcement.	500 000	
3.5 Strengthened National Spatial Information System for land use zoning and improved data collection, processing, and validation.	Land use zone maps produced, incl. data processing, in-site data collection), modelling, classification, field validation.	A clear understanding is developed of the types and areas of permitted land use.	National Land Zoning System established by the **end of YEAR 5**.	3 000 000	
Lead Agency: NLC			**TOTAL PAM BUDGET**	**4 600 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years) 2019-2023	Mid Term (6-10 years) 2024-2028	Long Term (11 years plus) 2029-2038
PAM 4: Strengthen the EIA process for infrastructure proposals							
4.1 Reviewing and revision of budget allocation practices, including procurement processes in order to mitigate environmental damages from infrastructure development.	Reviewed budget allocation practices and procurement processes.	Budget allocation practices and procurement processes reflect the law and NRS standards.	New budget allocation practices established by the **end of YEAR 5**.	300 000			
4.2 Evaluation of EIA guidelines and services from stakeholders' perspective to effectively implement the environment rules and	EIA guidelines and services evaluated.	Stakeholders understand environment rules and EIA processes.	Survey of stakeholders shows 80% understanding and satisfaction of the service **end of YEAR 4**	300 000			

regulation by the third party.					
4.3 Strengthening institutional capacity for EIA and compliance monitoring system.	EIA institutional capacity and compliance monitoring system strengthened.	Clear roles and responsibilities for EIAs. Sectorial conflicts are limited.	Roles & responsibilities structure established by the **end of YEAR 3**.	600 000	
4.4 Packaging of EIA for hydropower projects including power plant facilities, transmission lines and towers, and roads.	EIA packaging for hydropower projects complete.	EIAs to be assessed holistically, with future risks and impacts detected prior to project implementation	Power transmission lines, roads and facilities are all included in joint EIAs by the **end of YEAR 3**.	400 000	
Lead Agency: NEC **Supporting Agencies: GNHCS, MoAF**			**TOTAL PAM BUDGET**	**1 600 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 5: Achieve a highly diversified and technology-based timber supply chain							
5.1 Undertake a wood flow and market analysis across the entire timber supply chain	A deeper understanding of supply and demand of timber throughout the country	Total volumes of different tree species accounted for	Report on wood flow and market analysis by **end of YEAR 1**				
5.2 Establish a Forestry and Wood Innovation Hub of integrated wood-based industries.	The forestry innovation hub will help enterprises make a business out of using wood by-products in new ways.	Forestry innovation hub established and running.	Hub established by the **end of YEAR 3**	2 750 000			
5.3 Develop and increase the capacity of DoFPS, NRDCL and SMEs to operationalize improved approaches to timber harvesting	Analysis of timber pricing and market chain analysis completed, approved and published.	Analysis results approved.	Survey and analysis complete by the **end of YEAR 1**	200 000			

and processing and value addition.					
5.4 Promoting the utilization of alternative lesser known tree species to reduce pressure on high-value timber supplies.	Promotion campaign on the utilization of less preferred timber species and other forest resources completed.	New species identified and utilised in timber; the volume of estimated harvest.	Survey complete by the **end of YEAR 3**; promotion activities established by the **end of YEAR 5**.	225 000	
5.5 Promote and diversify timber products and value addition through the provision of low-interest finance for small to medium enterprises.	Promotion campaign completed and capacity building activities implemented.	Capacity building conducted (number of staff/community members).	50 staff trained by the end of 2020; promotion campaign established by the **end of the YEAR 2**.	150 000	
5.6 Improvement and dissemination of efficient wood technologies (harvesting,	Efficient wood technologies improved and disseminated.	Level of investment in wood technologies compared to baseline.	Increase in the investment of 25% by the **end of YEAR 5**.	2 000 000	

processing and recovery).					
5.7 Set up pilot projects to improve value at different levels of the timber supply chain.	Pilot projects on value addition in the wood supply chain are set up and are operating.	Number of effective pilot projects compared to baseline.	At least 4 pilot projects by **end of YEAR 3.**	250 000	
5.8 Piloting of new technologies and tools in wood-based industries, wood seasoning and treatment.	New technologies and tools in wood-based industries, wood seasoning and treatment piloted.	Level of investment and uptake compared to baseline.	The increase the adoption of new technologies and tools by at least 20% by the **end of YEAR 4**	200 000	
5.8 Updating government procurement policies and schedule of rates to show leadership in the use of lesser-known tree species and alternative timber products.	Government to showcase to the rest of society, the utilisation of lesser known tree species in government construction projects.	Volume of lesser known species utilised by the government.	Update schedule of rates by **end of YEAR 2**.	25 000	

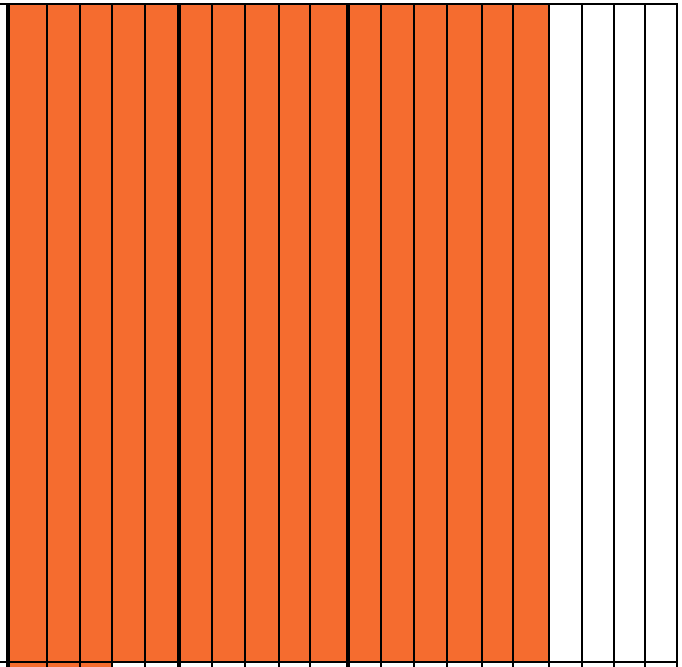
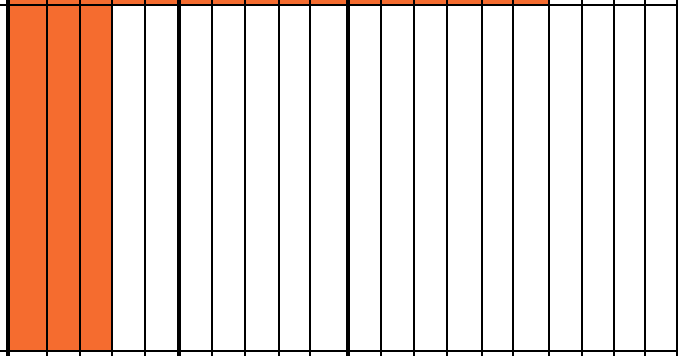
Lead Agency: DoFPS **Supporting Agency: NRDCL**	**TOTAL PAM BUDGET**	**5 800 000**

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 6: Adopt fire management approaches that limit impacts on the environment and communities							
6.1 Establish fire early warning systems, including communication tools and approaches to ensure that threats to communities are reduced and responses to fires are prompt.	Reduced pressure from fires and an increase in response times.	Efficient and effective fire early warning systems.	A fire early warning systems and tools established and running by the **end of YEAR 3**.	1 000 000			
6.2 Development of forest fire management planning guidelines including post forest fire management and replanting.	Forest fire preventative activities incl. prescribed burning and of fire lines in appropriate sites.	Forest fire management planning guidelines approved.	Management guidelines established by the **end of YEAR 3**.	250 000			

6.3 Survey and mapping of forest fire prone areas (fire hazard map).	Forest fire-prone area surveyed and mapped.	Survey maps made and available.	Maps developed by the **end of YEAR 3**.	250 000	
6.4 Instituting upscaling and operationalizing of forest fire management groups at all levels (village/gewog/dzongkhag/national).	Forest fire management groups are instituted upscaled operational.	Number of forest fire management groups in operation at all levels.	At least 50 % of all districts targeted and fire management groups established by the **end of YEAR 4**.	500 000	
6.5 Institutionalization of improved firefighting equipment and high-tech forest fire early-warning system.	Improved firefighting equipment and high-tech forest fire early warning system are institutionalized.	Level of investment by the government compared to baseline.	At least 50% of districts received improved gear by the **end of YEAR 4**.	2 000 000	
6.6 Enhanced knowledge and capacity building on forest fire prevention	Increased capacity at institutional and community levels.	Capacity building conducted (number of staff/community members).	At least 100 government staff trained by the **end of YEAR 3**.	1 000 000	

techniques at institutional and community levels.					
Lead Agency: DoFPS **Supporting Agency: FPED**			**TOTAL PAM BUDGET**	**5 000 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 7: Establish plantations to provide sustainable wood-based products supply to increase carbon-stock and enhance biodiversity							
7.1 Establish a Government-Private Sector Joint Plantation and Nursery Development Program.	Overall institutional framework to be established	Program terms of reference roles & responsibilities established	Program to be developed and running by the **end of YEAR 1**	100 000			

7.2 Establish 5 000 hectares of new plantations across a range of different ecological regimes for climate mitigation, livelihood development, wildlife habitat enrichment, watershed and soil conservation and recreation.	Nursery development upscaled and mass plantation conducted.	Level of investment compared to baseline; Number of trees grown and area of plantation established.	5 000 hectares of plantation established by the **end of YEAR 12**. *[targets for specific plantations to be discussed].*	18 900 000 *(To be discussed)*	
7.3 Capacity building guidelines tools and support for the private sector for plantation development and management.	Guidelines tools and programmes.	Sustainable and productive management of plantations.	Up 100 private sector organisations trained by the **end of YEAR 3**.	1 000 000	
7.4 Strengthening plantation development norms and	Plantation norms and standards revised; Alternative species to high-value timber	Plantation norms and standards reflecting existing requirements in	Standards established by the end of the **end of YEAR 4**.	450 000	

standards to promote multi-purpose plantations and species in different ecological and climatic zones.	identified for plantation in different ecological and climatic zones.	the law; List of species presented for plantation [*timeframe TBC*].			
7.5 Implementation monitoring and evaluation guidelines and tools capacity building and conducting ongoing monitoring and evaluation Management and control of invasive species and grazing.	Plantation monitoring guidelines and tools developed monitoring and evaluation conducted.	Monitoring and evaluation quality and frequency.	Monitoring and evaluation up and running by the **end of YEAR 2**.	1 150 000	
Lead Agency: DoFPS **Supporting Agency: NRDCL**			**TOTAL PAM BUDGET**	**21 600 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 8: Promote the development of enterprises that sustainably manage non-wood forest products (NWFP)							
8.1 Development of small and medium scale rural NWFP enterprises for domestic and international markets.	Small-scale rural enterprise facilitated; Potential NWFPs domesticated and commercialized.	Level of investment by the government compared to baseline; Number of enterprises operating.	50 NWFPs sale outlets established by the **end of YEAR 3**.	500 000			
8.2 Community capacity building and development of product guidelines to create a broader understanding of sustainable management harvesting and the supply chain of NWFP.	Product specific guidelines for the management and harvesting of potential NWFPs developed and reviewed; Supply chain analysis for potential NWFPs completed approved and published; capacity increased.	Level of investment by the government compared to baseline; Economic value of NWFPs.	100 communities trained by the **end of YEAR 3**.	500 000			

8.3 Incorporation of the objectives and actions for the sustainable management of NWFPs in management plans (Community Forest watershed protected areas and FMU management plans).	Improved sustainable management of NWFPs.	Number of management plans with NWFP management sections.	Management plans contain section on NWFP management.	75 000	
Lead Agency: DoFPS **Supporting Agencies: DAMC, DoA, SoE, CSOs, QPO, CB, MoEA, LG**			**TOTAL PAM BUDGET**	**1 075 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 9: Broaden opportunities for income generation from ecosystem services							
9.1 Encouragement and promotion of eco-tourism/ community-based ecotourism (eco-trails bird watching fishing hot springs rafting).	Promotion campaign for eco-tourism and community-based tourism; Capacity building conducted.	The number and economic value of eco/tourism schemes in operation.	10 new small-scale ecotourism ventures established by the **end of YEAR 5**.	1 000 000			
9.2 Training of communities on craft manufacturing and product diversification.	A diversified and highly valued craft industry.	Improvement in livelihoods for craft manufacturing.	25 communities trained and awareness raised in PES by the **end of YEAR 4**.	250 000			
9.3 Scoping and operationalizing potential Payment for Ecosystem	Potential PES schemes and biodiversity offsets scoped and operationalised.	Number and value of PES schemes in operation.	Scoping complete by **end of YEAR 2** and 5 PES schemes	900 000			

Services (PES) schemes.			operational by **end of YEAR 4**.		
9.4 Support capacity building for triple-bottom line accounting.	Accounting includes social, environmental and financial components	Number of government institutions undertaking accounting	Government institutions trained in triple-bottom lime accounting by end of **end of YEAR 3**	100 000	
Lead Agency: DoFPS **Supporting Agencies: CSOs, TCB, Parks, CBOs, LG, APIC**			**TOTAL PAM BUDGET**	**2 250 000**	

Policy & Measures	Expected Outcome	KPIs	Key Outputs	Budget, USD	Short Term (1-5 Years)	Mid Term (6-10 years)	Long Term (11 years plus)
PAM 10: Develop climate smart approaches in agriculture							
10.1 Encouraging agroforestry practices for promoting fodder trees and pasture development.	Widespread establishment of agroforestry practices for promoting fodder trees and pasture development.	A number of households is undertaking agroforestry practices; Capacity building conducted.	All districts trained by the **end of YEAR 5**.	2 250 000			
10.2 Promotion of high yielding cattle and a shift to commercial dairy farming	High yielding cattle and stall feeding promoted; traditional dairy farming practices into commercial farming promoted and upscaled.	A number of households adopting practice; Animal production per unit area; Capacity building conducted.	2500 high yielding cattle distributed by the **end of YEAR 4**; At least 100 dairy farms supported and communities trained by **end of YEAR 4**.	4 200 000			
10.3 Integrated fishponds and piggery development.	Integrated fishponds and piggery practices developed.	Number of households adopting development; Value from	At least 30% of households in each district number of households have fishponds/	500 000			

		fishponds and piggeries; Level of investment	piggeries **end of YEAR 6**.		
10.4 Encouragement of organic agriculture production integration of pest management and support for the development of trading strategies.	Widespread organic agriculture production pest management integrated, and trading strategies developed.	Number of households adopting production; Value from organics; Level of investment.	At least 30% of communities in 50% of districts trained by the **end of YEAR 5**.	500 000	
10.5 Promotion of cultivation of high-value crops.	High-value crops promoted and cultivated Capacity building and knowledge transfer	Adoption of value of crops; Level of investment.	High value crops promoted by end of YEAR 4	300 000	
10.6 Supporting farmers through supply chain development and the formation of cooperatives.	Farmers are provided with better access to markets.	Increase in value of marketable products.	At least 30 cooperatives established 10 priority districts by **end of YEAR 5**.	250 000	

Lead Agency: DoL/MoAF/ DoA **Supporting Agencies: CSOs, DMAC, DoL, DoFPS**	**TOTAL PAM BUDGET**	**8 000 000**

8.2 Annex 2: Cost Benefit Analysis Factors and Assumptions

PAM	Data/assumption	Value	Unit	Source
Sustainable forestry NWFP PES	Current forest degradation rate	14 059	ha/year	Drivers of deforestation and forest degradation -study
All PAMs	Carbon value	5.10	USD /tCO2e	Forest Trends. 2017. State of the Voluntary Carbon Markets 2017
Sustainable forestry fire LUP/EIA NWFP PES	Average value of NWFPs (current)	2.40	USD/ha/year	Data obtained from social forestry
Sustainable forestry NWFPs PES	Average value of NWFPs (degraded)	0.72	USD/ha/year	Key assumption
Sustainable forestry fire LUP/EIA NWFP PES	Average value of sediment removal (current)	2.86	USD/ha/year	Costing nature -study draft 2017
Sustainable forestry NWFPs PES	Average value of sediment removal (degraded)	0.86	USD/ha/year	Key assumption
Sustainable forestry fire LUP/EIA NWFP PES	Average CO2 stock (current)	89.70	tCO2e/ha	Costing nature -study draft 2017 and van Noord 2010.
Sustainable forestry NWFPs PES	Average CO2 stock (degraded)	26.91	tCO2e/ha	Key assumption
Sustainable forestry fire LUP/EIA NWFP PES	Average value of fuelwood (current)	2.05	USD/ha/year	Costing nature -study draft 2017
Sustainable forestry NWFPs PES	Average value of fuelwood (degraded)	0.62	USD/ha/year	Key assumption
Sustainable forestry fire LUP/EIA NWFP PES	Average value of water (current)	0.66	USD/ha/year	Assumption no data
Sustainable forestry NWFPs PES	Average value of water (degraded)	0.20	USD/ha/year	Key assumption
Value chains	Annual wood industries net income (current)	9 630 000.00	USD/year	Costing nature -study draft 2017
Value chains	Industrial wood use (current)	114 133.81	m3/year	Forests Facts and Figures 2016

PAM	Data/assumption	Value	Unit	Source
Value chains	Industrial wood use (at year 20)	136 960.57	m3/year	Key assumption
Value chains fire	Net income from roundwood sales	35.00	USD/m3	NRDCL + assumption
Value chains	Carbon dioxide released from timber when harvested	1.65	tCO2e/m3	Assumption + calculation
Fire	Area lost to forest fires (current)	7 301.73	ha/year	RNR statistics 2016
LUP/EIA	Deforestation rate (current)	5 798.00	ha/year	Drivers of deforestation and forest degradation -study
Fire	Average growing stock lost in fires	50.00	m3/ha	Key assumption
NWFP	Annual value of NWFP (current)	6 500 000.00	USD/year	Data obtained from social forestry
PES/Ecotourism	Annual value of PES/Ecotourism (in the project area)	500 000.00	USD/year	Key assumption
Agriculture and livestock	Value of the agricultural and livestock sector	86 524 000.00	USD/year	Derived from agricultural statistics
Cattle	Dairy		USD	
	Beef		USD	
	Stocking - units per hectare			
Plantation establishment	Average cost of native species		USD/ha	
Enrichment planting				

8.3 Annex 3: Stakeholder Consultation

Community/ District	Participants	Date of Meeting (2017)
Dagana	Bhutan Power Corporation Ltd. Individuals representing forestry timber harvesting agriculture & livestock Firewood usage forest fire hydropower	5th & 6th October
Bumthang	National Highland Research Development Center Jakar; Brown Swiss Farm; Bhutan Herbal tea processing unit; Chumey BHU; Wangchuck Centennial National Park; Bumthang Dzongkhag Administration; Bhutan Power Corporation Ltd; Natural Resource Development Corporation Ltd; KSY Sawmill; Department of Road Bumthang; Dekhey Sawmill; Nasiphel Sawmill; Thinley Tobzur Sawmill; Chogyal Furniture House; Dekiling Sawmill; Pema Sawmill	26th & 27th September
Trongsa	Trongsa Dzongkhag; Langthel Beat; Trongsa Range; Kuenga Rabten Beat; Green Bhutan Corporation Ltd; Tashiling Beat; Nubi Beat	14th & 15th September
Zhemgang	Renewable Natural Resources-Extension Department of Agriculture; Agriculture Dzongkhag; Livestock Dzongkhag; Rural Development Training Center Ministry of Agriculture and Forests; Bhutan Power Corporation Ltd; Department of Road; Municipal; Dzongkhag Land Section; Department of Engineer Section; Kawang Furniture House; Pradhan Furniture House; Tserzo Group; BAWCL; Zhemgang Range Office; Zhemgang Forest Division; Nimshong Range Office; Panbang Range Office; Mangduechu Beat Office; Bermo Botanical Garden; Diegala Beat Office; Shingkhar Beat Office	11th & 12th September
Haa	SFS Haa DoFPS; EA Bji DoFPS; EA Gakiling Department of Forest and Park Services; EA Sangbaykha DoFPS; EA Katsho DoFPS; EA Eusu DoFPS; Haa Range DoFPS; Tobjur Sawmill; Meri Puensum Sawmill; Samba Sawmill; Tshaphel Yarab Sawmill; Sherab Wangchuk Sawmill ; Ri Department of Forest and Park Services key Sawmill; Deujong Sawmill; Dago Sawmill; G.T. Sawmill; Jigme Khesar Strict NR; Haa East Forest Management Unit DoFPS; Selela Forest	11th & 12th October

Community/ District	Participants	Date of Meeting (2017)
	Management Unit; Langchu Forest Management Unit; Natural Resource Development Corporation Ltd; Department of Agriculture; Department of Livestock Haa; Bhutan Power Corporation Ltd	
Paro	District Vet.Hospital; Direct Aid Program; Kuenga sawmill; Indo furniture sawmill. Individuals representing forestry environment agriculture survey	2nd & 3rd October
Chukha	Phuntsho Timber Industry; Bhutan Board Product Ltd; Samphelling Gewog Ranger; Gedu; Jigme Sawmill; Bhutan Ply; Lokchina Gewog Ranger; Staple and Jattu Sawmill; Phunstholing Range; Natural Resource Development Corporation Ltd; Green Bhutan Corporation Ltd; Metakha Gewog Ranger; Bongo Gewog ; Gelling Gewog Ranger; Tshimasham Ranger office; Darla Gewog Ranger ; Chukha; Getana Livestock; Getana Agriculture; Dungna Gewog Ranger; Chapcha Forest Ranger; Getana Gewog Ranger; Gedu Forest Range; Druk Green Power Corporation Limited; Phuntsholing Range; Forest Range office; Nonwoof Forest Products Technology Centre	20th & 21st October
Punakha	Dzomi Gewog; Toeb Gewog; Toewang Gewog; Talo Gewog; Punakha; Forest Division; chhubu Gewog; Guma Gewog; Kabjisa Gewog; Shangana Gewog; Limbukha Gewog; Guma Gewog	17th & 18th September
Thimphu	Dagala Gewog; Forest Division; Department of Road; GBCL; Thimphu Throm; Mewang Gewog; Geney Gewog; Livestock section; Kawang Gewog; Chang Gewog; Agriculture section; Land Record Section	4th & 5th September
Trashiyangtse/ Trashiyangtse	DYT; BWS; NSC; DcForest Management Unit; Range Office; BWS; KHEL; Clean Bhutan; TFD; Beat Office; Dzongkhag Administration; Doksum Range; Bhutan Power Corporation Ltd; TFD; Agriculture; Local Government	31st October & 1st November

Community/ District	Participants	Date of Meeting (2017)
Samdrup Jongkhar/ Samdrup Jongkhar	DoFPS; Bhutan Power Corporation Ltd; Khenchab Sawmill; Natural Resource Development Corporation Ltd; DAS; Thromde; Department Of Roads; Department of Livestock; DZO	12th & 13th September
Darla/ Chukha	Bongo Gewog; Geling Gewog; Lokchina Gewog; Dungna Gewog; Darla Gewog; Bjabcho Gewog; Getena Gewog; Phuntsholing Gewog; Sampheling Gewog; Metakha Gewo; Chapcha Gewog; Sharphu Gewog; Community Forest Member	17th & 18th September
Chumey and Tang Geogs/ Bumthang	Chumey Gewog; Tang Gewog; Bumthang	21st and 22nd September
Chokhor Gewog/ Bumthang	Nasiphel Chiwong; Nasiphel Zangling & Zhabjithang Chiwong; Kharsong tsawa Chiwong ; Wangchuck Centennial National Park Central Park Range; Dhur Chiwog ; Dhur-Lusbi Chiwog ; Gewog Administration Chokhor Bumthang ; Tamshing Chiwog; Kashingtsawa ; Dorjibee Chiwog; Kashingtsawa-Dorjibee Chiwong ; Kharsa Thangbee Chiwog; Kharsa Chiwong	21st and 22nd September
Dewathang/ Samdrup Jongkhar	Dewathang Gewog; Samdrup Jongkhar; Wangphu Gewog; JWS; Orong Gewog; Gomdar Gewog	18th & 19th September
Phuntshothang/ Samdrup Jongkhar	Local Government; DoFPS; MoAF; Tshalingkhar Community Forest; Ralling Community Forest	12th & 13th September
Minjiwoong/ Samdrup Jongkhar	Local Government; DoFPS; Suskar Kuenphen Norbuling; Monmola Jehung Phendey; Kuenphen Yizhin Norbuling; Denphu; DoFPS; Serthi; Langchen-agurung; Rigsar Community Forest; Kuenphen Yizhin Norbuling; Khanduphung Gayjung	27th & 28th September
Dagana Forest Division/ Dagana	Geserling Gewog; Tshendagang Gewog; Tshangkha Gewog; Drujeygang Gewog; Laja Gewog	9th & 10th October

Community/ District	Participants	Date of Meeting (2017)
Trong/ Zhemgang	Community Forestry Representative; Dangkhar Community Forest Representative; Trong ; Subrang; Zurphel/Tshajing ; Tali; Buli; Shingkhar; Thrisa; Nimshong ; Bardho; Digala; Khomshar; Bjoka; Goshing; Rebati; Panbang ; Tama Berti; Gomphu; Phulabi; Dangkhar	11th & 12th September
Royal Manas National Park/ Trongsa	Community Forest; Eco-lodge; Local Government	20th & 29th September
Haa	Ketshen Community Forest; Luciana Berger; Gensa Community Forest; Yangthang Community Forest; Phurb Community Forest; Eussu Community Forest; Sektena Community Forest; JKSNR Department of Forest and Park Services; Dumcho Community Forest; Mochu Community Forest; Dorib Community Forest; Shari Community Forest; Nakha Community Forest; Balam Community Forest; Betsho Community Forest; Sangbeyama Community Forest; Local Government; Sangbeykha; Tarayana Foundation; Haa Range DoFPS	9th & 10th October
Lamgong/ Paro	Local Government; Doteng Community Forest; Namje Community Forest; Bara Phenday Community Forest; Non-wood forest products-mushroom; Khangkhu Pendeling Community Forest; Chubjakha Community Forest/ Local Government; Jariphuensum Community Forest; Juka Jeklng Community Forest; Shair Community Forest; Druk Pegong Community Forest; Dagophu Community Forest	14th & 15th September
Pema Karpo/ Punakha	Punakha Range; Samdingkha Beat; Kabesa Beat; Talo Forest; Phendhey Community Forest	14th & 15th September
Rochog Pel/ Thimphu	Tendrelgang Community Forest; Zanglakha Community Forest; Tshaphu Community Forest; Nobrig Community Forest; Goenday Kuenzom Community Forest; Geney Tashi Wanchey Community Forest; Tashi Tangyal Community Forest; Rinchending Community Forest; Dalukha	7th & 8th September

Community/ District	Participants	Date of Meeting (2017)
	Community Forest; Kuzuchen Community Forest; Geney Mushroom Management Group; Shershong Community Forest; Hongtso Community Forest; Khariphu Community Forest; Damchoe Community Forest; Jom Daga Ngomen Tshogpa; Hongtso Community Forest; Dashi Community Forest	
Trashigang	Local Government; Community Forestry; Livestock; Beat Office; RO Wamrong; Agriculture	25th & 26th October
Samste	Local Government; Community Forest; Kyingkhor Consultancy Services	25th &26th September
Sephu Gewog/ Wangdue Phodrang	Busa-Zeri Chiwog Sephu Gewog administration; Wangchuck Centennial National Park; Sephu Gewog Administration; Rukubji Chewog Sephu Gewog administration; Bumilo Chewog Sephu Gewog administration; Longtoe–Gangchukha Chewog Sephu Gewog administration; Sephu Gewog Administration	12th & 13th September
Shumar/ Pemagatshel	Community Forest; Shumar; Nanong; Zobel; Forest Division	26th & 27th September
Chongshing/ Pemagatshel	Local Government; Community Forest; Non-wood forest products; Khar; Shumar	2nd & 3rd October
Nganglam/ Pemagatshel	Local Government; Community Forest; Livestock; Renewable Natural Resources; Non-wood forest products; Non-wood forest products	6th & 7th October
Pemagatshel	Dzongkhag; Business; Zobel; Shumar; Khangkarina; Nangkhor; Bartsheri; Urichi/DGC; Range Office; Druk Satair Corporation Ltd; Gypsum; Division; Community Forest; Samrang	10th & 11th October

Community/ District	Participants	Date of Meeting (2017)
Samste	Tashicholing Range; Dorokha Geog; Samtse Range; Tading; Dorokha; Tading Beat Office; Taging Geog; Samtse Division; Samtse Dzongkhag; Norbugang; Samtse Geog; Norbugang Range; Ugyentse; Norbugang Range; Phuntshopelri; Yoeseltse; Dorokha; Tenduk Geog; Tashicholing Geog; Tashicholing Range; Namgaycholing geog; Sangacholing Geog; Tading Beat office	12th & 13th September
Tsirang	Phungtenchu Geog; Mendrelgang Geog; Barsong Geog; Dunglagang Geog; Gosaling Geog; Patshaling Geog; Semjong Geog; Kilkhorthang Gewog; Rangthaling Geog; Tsirangtoed Gewog; Sergithang Geog; Tsholingkhar Geog; Shemjong; Semjong Geog; Patshaling Geog; Kikhorthang geog; Shemong geog; Rangthaling Geog; Tsirang Forest Division	11th & 12th October
Trashigang	Local Govt; RO Wamrong; Community Forestry; Livestock; Beat Office; Agriculture; Royal University of Bhutan; Sakteng Wildlife Sanctuary; Watershed Management Division	25th & 26th October