

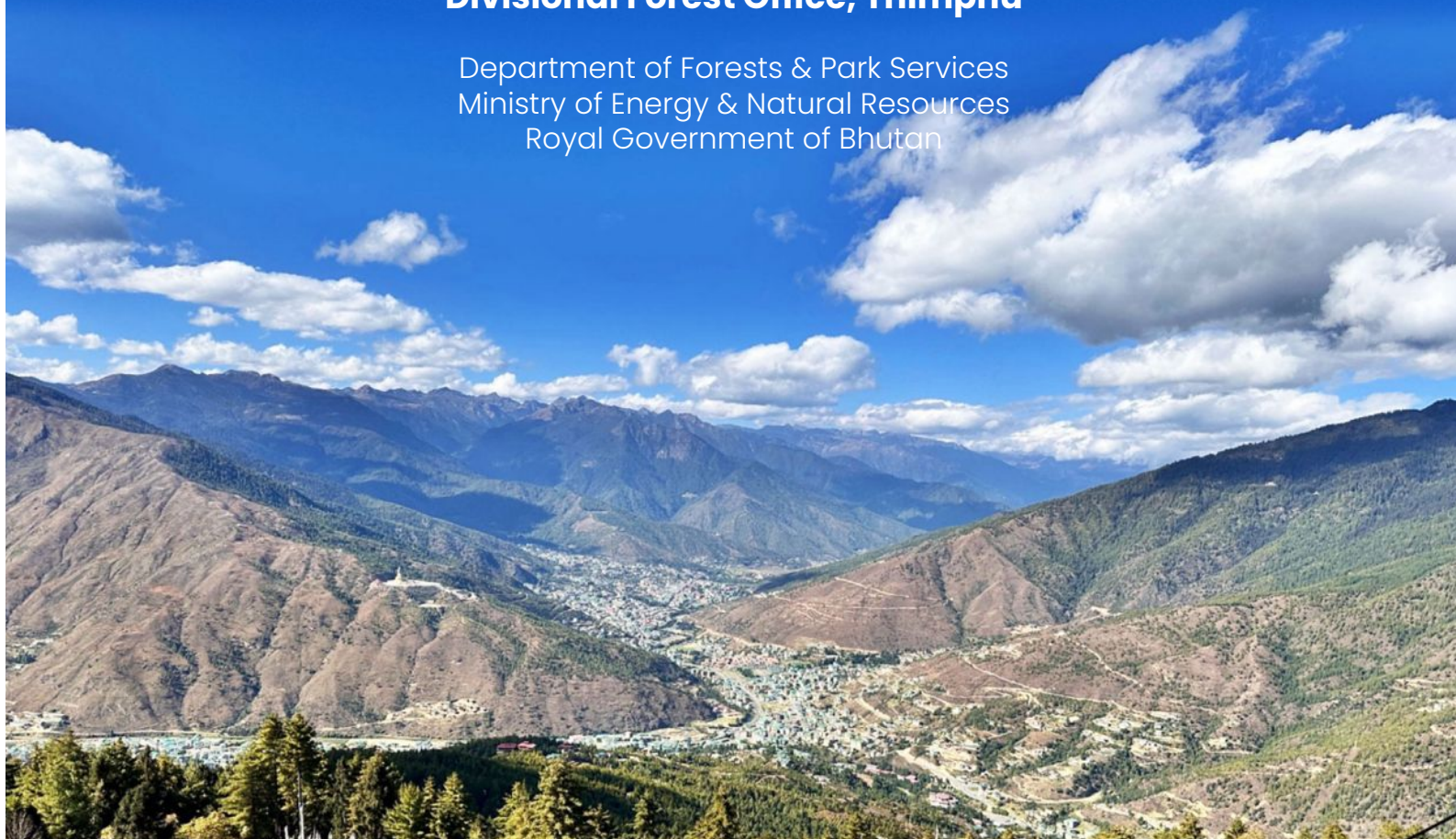
THIMPHU



Divisional Forest Office Management Plan

(January 2026 – December 2035)
Divisional Forest Office, Thimphu

Department of Forests & Park Services
Ministry of Energy & Natural Resources
Royal Government of Bhutan



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Approval Sheet

Period of the Plan

This plan is valid for the period of 10 years from January, 2026 to December, 2035

Submitted for approval:



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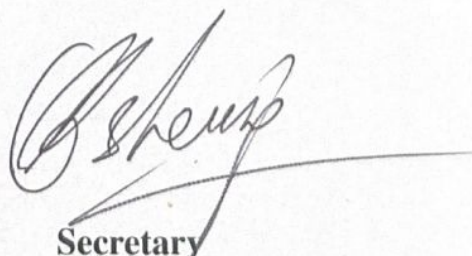
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for approval:**



Director

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and Park Services

APPROVED



Secretary

Ministry of Energy and Natural Resources

Foreword



Forests have long been central to the livelihoods of the Bhutanese people and are deeply interwoven with the country's social, cultural, and traditional values. Beyond their contribution to socio-economic development, forests play a critical role in climate regulation and the provision of essential ecosystem services. Recognizing this importance, Bhutan is among the few countries to enshrine environmental conservation in its Constitution. Article 5 of the Constitution mandates that at least 60 percent of the country's land area be maintained under forest cover for all time. Bhutan has further reinforced its global environmental leadership by committing to remain

carbon neutral at the 15th Conference of Parties to the UNFCCC in 2009, a pledge reaffirmed through its Intended Nationally Determined Contribution submitted in 2015 under the Paris Agreement.

Currently, forests cover over 69.7 percent of Bhutan's total land area, making them an indispensable national asset. These forests sequester an estimated 8.5 million tonnes of carbon annually, sustain reliable water flows critical for hydropower generation, and provide essential resources such as timber and firewood to citizens. In light of Bhutan's national and international commitments, as well as the social, cultural, economic, and ecological benefits derived from forests, sustainable forest resource management remains imperative, particularly through targeted and effective interventions at the Divisional level.

Accordingly, this Divisional Forest Management Plan has been developed as a comprehensive framework for sustainable forest management within the Divisional Forest Office. The plan takes stock of existing management initiatives and presents the current status of forest area, biodiversity conservation, growing stock, resource allocation, local socio-economic conditions, and human-wildlife conflict. It prescribes strengthened conservation measures, sustainable resource utilization, climate change adaptation and mitigation actions, and human-wildlife conflict management, supported by a phased implementation plan, financing framework, and monitoring system. Developed through broad stakeholder consultation, the plan ensures shared ownership and institutional endorsement. The Division Forest Office is commended for this important milestone toward advancing sustainable forest management and biodiversity conservation.

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Director

Acknowledgement

The Divisional Forest Office Management Plan is the result of a collective and dedicated effort by the staff of the Divisional Forest Office, Thimphu. The Division sincerely acknowledges the commitment, professionalism, and teamwork demonstrated by all officers and staff who contributed their time, experience, and technical inputs toward the successful formulation of this plan. Their sustained engagement throughout the planning process ensured that the document is comprehensive, practical, and grounded in field realities.

The formulation of this Management Plan was made possible through the unwavering support and guidance of the IKI Task Force Members under the IKI Project. The Division is deeply grateful for their strategic direction, technical advice, and continuous encouragement throughout the planning process. The Division further expresses its sincere gratitude to the IKI Project, “*Living Landscapes: Securing High Conservation Values in South-Western Bhutan*,” for its generous financial support, which enabled the conduct of comprehensive socio-economic and field surveys. The data generated through these assessments formed a critical foundation for evidence-based planning and significantly informed the management prescriptions contained in this plan. WWF–Bhutan, together with the Project Coordination Unit, played a pivotal role in facilitating the timely procurement of essential equipment and field gear, and in delivering capacity-building programs both within and outside the country. These interventions greatly strengthened the technical capacity of the field teams involved in the assessment.

The Division would like to extend special appreciation to Mr. Lhaba who played a crucial leadership role in guiding and coordinating the formulation of this Management Plan. His dedication, technical oversight, and leadership were instrumental in bringing the planning process to completion. Finally, the Division extends its heartfelt thanks to all individuals, institutions, and stakeholders who, in various capacities, contributed to the development of this Management Plan. Their collective efforts have resulted in a key milestone that will guide sustainable forest management and biodiversity conservation in the Division in the years to come.

Abbreviations

AGB	Above Ground Biomass
AM	Alpine Meadow
ABMR	Area Based Management Regimes
BA	Basal Area
BGB	Below Ground Biomass
BMG	Biodiversity Monitoring Grids
BC	Biological Corridor
BPF	Blue Pine Forest
BLF	Broad Leaved Forest
CWD	Coarse Woody Debris
CF	Community Forest
CCMR	Cross-Cutting Management Regimes
DoW	Department of Water
DBH	Diameter at Breast Height
DFO	Divisional Forest Office
FF	Fir Forest
FNCA	Forest and Nature Conservation Act of Bhutan
FNCRR	Forest and Nature Conservation Rule and Regulations
FIRMS	Forest Information Reporting and Monitoring System
FMU	Forest Management Unit
G2C	Government to Citizen
ha	hectare
HCV	High Conservation Value
HCVA	High Conservation Value Area
HWC	Human Wild Life Conflict
IUCN	International Union for Conservation of Nature.
JDNP	Jigme Dorji National Park
LULC	Land Use Land Cover
LFMA	Local Forest Management Area
LG	Local Leaders
MoAF	Ministry of Agriculture and Forest
MoENR	Ministry of Energy and Natural Resources
MCF	Mixed Conifer Forest
NCD	Nature Conservation Division
NWFPMA	Non Wood Forest Product Management Area
NA	Not Applicable

OHP	Occupational Health and Safety
OP	Operational Plan
PES	Payment for Ecosystem Services
PA	Protected Area
RBA	Rapid Biodiversity Assessment
RGoB	Royal Government of Bhutan
SDS	Service Delivery Standard
SOC	Soil Organic Carbon
SMART	Spatial Monitoring and Reporting Tool
Sq.km	Square kilometer
SRFL	State Reserved Forest Land
SFM	Sustainable Forest Management
TBD	To Be Decided
T/L	Truck Load
WBIs	Wood Based Industries

Glossary of Bhutanese Terms

<i>Balu Sulu</i>	<i>Rhododendron anthopogon and R.setosum leaves</i>
<i>Chhuzhing</i>	<i>Wetland/Paddy Field</i>
<i>Chiwogs</i>	<i>Sub-Blcok</i>
<i>Gewog</i>	<i>Sub-District</i>
<i>Sokshing</i>	<i>forest land for collection of leaf litter</i>
<i>Tsamdro</i>	<i>forest land for grazing</i>

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Executive Summary

The DFO Management Plan for DFO Thimphu will be implemented beginning January 2026 to December 2035 (10 years). It provides a comprehensive framework for sustainable forest management. The plan which is developed with funding support from International Climate Initiative (IKI), WWF Bhutan under the project titled “Living Landscapes: Securing High Conservation Values in Southwestern Bhutan” emphasizes the integration of scientific principles, conservation priorities and community well-being.

The plan aligns with Bhutan’s constitutional mandate of maintaining a minimum of 60% forest cover addressing national policies and legislation that guide forest and biodiversity conservation. It highlights the significance of forests in maintaining ecological balance, supporting biodiversity and sustaining local livelihoods.

A unique feature of this plan is the identification and management of High Conservation Value Areas. Besides the existing management regimes, Dagala Water Catchment Area with an area of 2221 hectare has been identified following a robust screening process. Threats to High Conservation Value Areas such as: forest fire, illegal logging, road development, pest and disease have been identified.

The plan also provides insights into the current status of forest resources, biodiversity and socioeconomic dynamics within the landscapes. It underscores the importance of community participation in achieving conservation goals while ensuring sustainable resource utilization. Since climate induced impacts on sustainable forest management and livelihood aspects of communities are evident and already visible, climate vulnerability of the division and strategic mitigation measures are detailed.

The plan adopts a forward-looking approach, prescribing targeted interventions for biodiversity conservation, ecosystem services, and community resilience. The management prescriptions focus on safeguarding High Conservation Value Areas, promoting sustainable livelihoods, and reducing human-wildlife conflict.

The implementation framework outlines clear strategies for achieving the plan’s objectives, supported by a detailed financial outlay. Robust monitoring and evaluation mechanisms are incorporated to ensure accountability and adaptability in meeting conservation and management targets.

This plan serves as a strategic tool for sustainable forest management, securing biodiversity, enhancing community livelihoods, and mitigating climate change impacts in the IKI Living landscapes of Divisional Forest Office, Thimphu. It sets a benchmark for integrated forest management under five broad objectives.

To summarize, Chapter I of the plan document talks on significance of forest, overview of sustainable forest management and legal framework within which sustainable forest management practices get implemented. More importantly, this chapter also talks on vision, and mission of the XIII Department based on which the purpose and objectives of developing this plan document is aligned.

Chapter two basically describes the current situation and status of biodiversity conservation. It highlights on human resources, infrastructure, budget allocation and revenue col-



lection of the division. Similarly, it also mentions on existing management regimes with which forest ecosystem have been managed before developing this plan. It also touches on forest cover, growing stock, carbon stock and carbon sequestration potential of the division. Function mapping is one important section which will be crucial to understand areas under different management circles within which developmental activities including forestry operations take place within the purview of FNCA and FNCRR 2023. Social or people and livelihood aspects is also described under this chapter. Special component under this chapter is the climate change and its impacts where climate vulnerability of the division is described where Mewang Gewog is found to be the most vulnerable gewog followed by Chang Gewog. Additionally, a new management regime which is categorized as cross-cutting management regime is described in detail.

Chapter 3 which is related to review of the past management plan is currently left blank as this the first DFO management plan. Finally, the descriptive part of the plan ends with Chapter 4 which talks on Threat and Challenges facing the division. It describes in detail the thirteen threats and challenges identified through SWOT analysis. The Threat ranking output and conceptual model under this chapter clearly depict the overall threat situation and strategic approaches to address the them.

The prescriptive part of the plan document begins with Chapter 5 where a total of 14 strategies and 67 actions have been identified to achieve the five broad objectives. Chapter 6 outlines the implementation plan and financial requirement for the plan period of 10 years followed by Chapter 7 which talks on monitoring and evaluation of the planned activities. Chapter 8 which is the final part of the plan document touches on public consultation and endorsement with detailed list of stakeholders who have been consulted particularly on management prescriptions.

This plan which intends to manage a total area of 87641.20 hectares for the next 10 years require a total financial support of Nu. 246.71million.

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Key facts of DFO Thimphu

Sl.No.	Forest statistics		
1	Total Forest Area	ha	57647.93
2	Forest Cover Percent	%	65.78
3	Broadleaved forest	%	6.65
		ha	3835.96
4	Conifer forest	%	93.35
		ha	53811.97
5	Basal area per hectare	m2/ha	38.67
6	Growing stock per hectare	m3	359.28
7	Biomass stock per hectare (AGB, BGB, DoM)	t/ha	197.51
Protected Areas			
1	Biological Corridors	ha	NA
		No.	NA
2	Bey Biodiversity Areas	ha	NA
		no.	NA
3	High Conservation Value Area	ha	2220.94
		no.	1
4	Botanical Garden	ha	NA
		No.	NA
Sustainable Forest Management Regimes			
1	Forest Management Unit Areas	ha	17610.03
		No.	2
2	Total area of Community Forest	ha	2438.37
	Total Community Forest	No.	21
	Total household involved in CF	No.	843
3	Local Forest Management Area	ha	11717
		No.	2
4	NWFP Groups	ha	8587.62
		No.	2
Wood-based industries			
1	Wood-based industries	No.	107
Field Division and field offices			
1	Divisional Forest Office	No.	1
2	Range Office	No.	4
3	Beat Office	No.	5
4	Forest Check Post	No.	1
5	Biodiversity Information Center	No.	NA



Chapter 1: Background

1.1 Rationale

Bhutan though a small country, is widely recognized across the world for its environmental conservation initiatives and as a carbon-negative country in 21st century. The intact natural resources that we have today is a testimony to the farsighted conservative visions of our successive monarchs and the sound environment conservation policies of the country. However, over the years the forest management policies have undergone significant changes from that of more conservation focused to sustainable utilization of forest resources. Though scientific management of our forest resources has adhered to the principles of sustainability, it has become more crucial than ever in the face of a changing climate and its impacts. Today climate change and its impacts has widely affected many countries. Bhutan by virtue of being located in a most fragile mountain ecosystem is even more poised to the impacts of climate change. Thus, Bhutan is one of the few countries in the world that enshrines forest and environmental conservation aspects in its Constitution. Article 5 of the Constitution of the Kingdom of Bhutan reflects commitment to ensure that, in order to conserve the country's natural resources and to prevent degradation of the ecosystem, a minimum of sixty percent of Bhutan's total land shall be maintained under forest cover at all time.

Divisional Forest Office, as the custodian of our forest resources in the Dzongkhags, plays an integral role in conserving and protecting our natural forest resources besides catering forestry services to the people of the country. It is one of the main players in implementing our sound environmental conservation policies and ensuring our commitment to remain carbon neutral and maintain 60% forest cover for all times to come. Though management of forest resources within the divisional jurisdiction is guided by the noble principles of sustainability, it is even more important to be scientific along with long term divisional goals and objectives. It is also equally important to review and evaluate such goals and objectives on a periodic basis.

Therefore, in order to do so, a comprehensive and climate smart Divisional Forest Management Plan with time bound vision, mission, objectives and goals is imperative. It shall serve as an overarching scientific Forest Management Plan in scientifically managing the forest resources within the jurisdiction of the Forest Division.

1.2 History and Significance

1.2.1 Importance of Forests

Article 5 of the Constitution of the Kingdom of Bhutan proclaims that every Bhutanese is a guardian of the nation's natural heritage. It entrusts the Royal Government with the responsibility to conserve and enhance the environment, safeguard Bhutan's rich biodiversity, and harmonize economic and social development with the principles of sustainability. Central to this vision is the constitutional mandate to maintain a minimum of 60% of the country's land under forest cover for

all time. Forests form the backbone of Bhutan's ecological integrity, providing essential ecosystem services, sustaining water resources, protecting against climate change, and supporting the wellbeing and livelihoods of its people. As one of the world's few carbon-neutral nations, Bhutan absorbs more carbon than it emits and has pledged to preserve this status for future generations, an achievement made possible largely through its thriving forests.

1.2.2 Overview of the Sustainable Forest Management

Sustainable Forest Management (SFM) is vital for Bhutan, a nation celebrated for its exceptional biodiversity which is deeply rooted into socio-cultural values. Guided by its constitutional mandate to maintain at least 60% forest cover, Bhutan strives to balance socio-economic development with environmental conservation. This commitment is firmly anchored in its legal and policy instruments, including National Forest Policy (NFP) 2011, Forest and Nature Conservation Act (FNCA) 2023 and the Forest and Nature Conservation Rules and Regulations (FNCRR) 2023. These frameworks provide a clear roadmap for managing forest resources for community wellbeing while upholding ecological integrity.

Within the landscape of DFO Thimphu, SFM adopts an integrated approach that embeds conservation into any developmental projects and programs. For instance, 21 community forests are established to empower local communities in managing the forest resources surrounding their villages. Similarly, two Local Forest Management Areas (LFMAs) cater to the need of the local communities based on annual allowable cut. Besides the demand placed for rural requirement, commercial timber demand primarily from construction sector placed through wood-based industries are met from Forest Management Units. All these allotments be it rural or commercial are guided by technical prescriptions and annual harvesting limit worked out for each of the management regimes. As to compensate the forest degradation in various forms such as loss to forest fire, forest pest and diseases, die-back and for developmental activities, reforestation activities in the form forest plantation are done on targeted areas based on available resources.

An additional feature of SFM is the identification and management of High Conservation Value Area (HCVA) initiated under the IKI Living Landscape Project. This new management regime not only looks at sustainable forest management but wholistically targets at the management of other ecosystem services on which human kind depend on daily basis.

1.3 Policies and Legislations

1.3.1 National Forest Policy 2011

The National Forest Policy 2011 was formulated to keep up with changing times and the evolution of forest management concept of the SRFL. Since 1957, Forest governance has transitioned from providing “free access” to “almost no access” to “managed access”.

The Forest Policy 2011 broadly stipulates to apply scientific management approaches to all of Bhutan's forest and biodiversity resources for the benefit of people without

compromising the conservation values and the constitutional mandate of maintaining a minimum of 60 % forest cover for all time.

The Policy while stating about different management regimes also has provisions on the forest-based industries and need of proper utilization and marketing in developing private sector and rural communities. Some of the main features of the Policy include a science-based participatory approach to forest governance and sustainable forest management with emphasis on efficient and environment friendly technologies for value-addition and waste minimization.

1.3.2 Forest and Nature Conservation Act of Bhutan (1969, 1995, 2023)

The Bhutan Forest Act 1969 is one of the first Acts passed by the RGoB. The Act nationalized “all land under which no person has acquired a permanent heritable and transferable right of use and occupancy” as forests. It further identified and provided directives regarding the forest rights, uses, royalties and penalties. The Act stipulated that at least 60% of the country should remain forested at all times.

The Bhutan Forest Act 1969 was repealed and ratified in 1995. The Forest and Nature Conservation Act of Bhutan 1995 identified and outlined the requirement of management plan for production and protection of forest and wildlife. Emphasis was given to community and social forestry and encouraged the participation of community and private individuals. The Act also provided the legal basis for defining management restrictions in the process of forest planning and function mapping.

In 2023, the Bhutan Forest Act of 1995 was both revoked and endorsed. Forest and Nature Conservation Act of Bhutan 2023 places a significant focus on achieving a harmonious balance between socio-economic development and ecological considerations. The Act underscores the importance of sustainable management practices to preserve the diverse array of plant and animal life, ensuring their benefits endure for present and future generations. Equitable access and sharing of benefits arising from and ecosystem services are emphasized, aiming to promote fairness and inclusivity. Moreover, the Act aims to bolster the resilience and adaptability of forests in the face of climate change and human activities. Lastly, it underscores the critical role of rejuvenating and safeguarding watersheds and wetlands to ensure a continuous and dependable supply of water for long-term sustainable use.

1.3.3 Forest and Nature Conservation Rules (2000, 2003, 2006, 2017, 2020, 2023)

The Forest and Nature Conservation Rules (FNCRR) 2000 was revised in 2003 and again in 2006 to mainly accommodate a broader scope of the power and duties vested by the FNCA 1995 which were not covered by earlier FNCRR. The FNCA 1995 mandated the Department to manage SRF including Community Forests (CF) protect and conserve wildlife, soil & water and related natural resources of Bhutan. The FNCRR 2006 issued authority and provisions for the preparation of management plans for Protected Area (PA), Forest Management Units (FMU), CF, NWFP (Non-Wood Forest Produce Management Area), Soil & Water conservation. Various amendments to the

FNCR 2006 have been done over the year due to changing times but keeping in line with the provisions of the NFP 2011. Further, a separate amendment to the FNCR 2006 was carried out due to the adoption of the revised rule for the rural timber allotment as part of the implementation of the Government to citizen services program. The FNCR 2006 was again revised in 2017 which was an amalgam of all the different amendments made to the FNCR 2006 and the provision on the Rules on Biological Corridors (BC) 2007, which defined the protection status and prescription of the BC plan.

1.3.4 Land Lease Rules and Regulations of Bhutan 2018

The Land Lease Rules and Regulations of Bhutan 2018 implements the provision of the Land Act of Bhutan 2007 and necessitates the requirement of forestry clearance for issuance of lease of SRF Land. Further, it strongly discourages and forbids lease of land registered under Government institutions and areas which are under different management namely designated Parks, Nature Reserve, PA, BC, Buffer Zones, CF, Critical Watershed, Wetland, High Risk Zones, Nyes, religious sites & important monuments and Restricted Zones. However, the Secretariat can make exemptions for only those critical infrastructures of national importance and public need under only special circumstances as deemed relevant by it.

1.3.5 Biodiversity Act of Bhutan 2003

The Biodiversity Act of Bhutan 2003 provides for the conservation and sustainable utilization of biological resources & associated traditional knowledge and ensures Sui Generis protection of plant varieties. It also authorizes the implementation of the Access and Benefit-sharing regime to derive additional benefits fairly and equitably.

1.3.6 Land Act of Bhutan 2007

The Land Act of Bhutan 2007 provides for the leasing of state land for economic and various other activities. All Tsamdro (forest land for grazing) and Sokshing (forest land for collection of leaf litter) rights shall revert to the State and convert to leasehold uses with management plans giving preference to previous rights holders.

1.3.7 National Environment Protection Act of Bhutan 2007

The National Environment Protection Act 2007 provides for the establishment of an effective system to conserve and protect the environment through the National Environment Commission or its successors, designation of competent authorities and constitution of other advisory committees, to independently regulate and promote sustainable development equitably. The Act also calls for the conservation and protection of wetlands, alpine regions, watersheds, and other vulnerable ecosystems in addition to the existing protected areas.

1.3.8 Waste Prevention and Management Act of Bhutan 2009

The Waste Prevention and Management Act of Bhutan 2009 promotes the minimization and sound management of waste in the country through the 3 Rs (Reduce, Reuse and Recycle). The Act further identifies different agencies for the regulation of waste in the

country wherein it empowers the MoAF to ensure the prevention and management of waste concerning the agricultural sector, including livestock and forestry.

1.3.9 Climate Change Policy of the Kingdom Bhutan, 2020

Bhutan, a landlocked country in the Eastern Himalayas, is highly vulnerable to the impacts of climate change due to its fragile mountain ecosystems, dependence on climate-sensitive sectors (like agriculture, hydropower, and forestry), and limited adaptive capacity. Despite being a net carbon sink absorbing more greenhouse gases than it emits. Bhutan faces increasing risks from climate-induced disasters such as glacial lake outburst floods (GLOFs), erratic rainfall, landslides, and droughts.

To address these challenges and align with its international commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, Bhutan adopted the Climate Change Policy of Bhutan 2020. This policy provides a strategic framework for coordinated action on climate change mitigation and adaptation, while ensuring that development remains sustainable and resilient. It also provides strategic guidance to ensure that Bhutan remains carbon neutral and protects the wellbeing of the people by adapting to climate change efficiently and effectively. Additionally, the policy also aims to address challenges and opportunities such as international support in the form of finance, technology, capacity building, research and awareness arising from recent developments in the national and international arena of climate change, which will be critical in implementing climate actions. This policy also ensures meaningful participation of all relevant stakeholders in climate change actions in a coordinated and coherent manner with clear roles and responsibilities.

1.3.10 Nationally Determined Contribution, 2021

Bhutan's 2nd NDC was officially launched on June 5, 2021, coinciding with World Environment Day and ahead of COP26. It reaffirms Bhutan's pledge to remain carbon neutral, and outlines enhanced mitigation measures via sector-specific Low Emission Development Strategies (LEDS) and updates to the National REDD+ Strategy and Action Plan. Bhutan's 2nd NDC advances LEDS across multiple sectors to decouple development from emissions. It also highlights key sector specific adaptation and mitigation measures and initiatives that will be taken by Bhutan. In presenting the second NDC, Bhutan maintains the commitment to remain carbon-neutral where emission of greenhouse gases will not exceed carbon sequestration by our forests and sinks as first pledged in 2009 and reaffirmed in the first NDC. At the same time, Bhutan calls on the international community to continue and enhance the support for Bhutan's efforts to mitigate and adapt to climate change. While Bhutan's first NDC covered broad priority action areas, the second NDC further enhances our actions by elaborating priority mitigation actions in the form of LEDS, roadmaps and strategies.

1.3.11 National Adaption Plan of the Kingdom of Bhutan, 2023

The National Adaptation Plan (NAP) process was initiated by Bhutan in line with the UNFCCC Cancun Adaptation Framework (2010), which called on countries to formulate medium- and long-term strategies to address climate change impacts. While Bhutan had earlier prepared two National Adaptation Programmes of Action (NAPAs) focused

on urgent and immediate needs, the NAP aims to provide a comprehensive, long-term framework for integrating climate change adaptation into national planning and development.

Bhutan began developing its NAP with support from the Green Climate Fund (GCF), the UNDP, and other partners around 2019. The objective is to identify, prioritize, and mainstream adaptation needs across key sectors such as agriculture, forestry, water resources, health, energy, and infrastructure, ensuring that climate resilience is embedded within the country's socio-economic development guided by the philosophy of Gross National Happiness (GNH). The NAP process also emphasizes strengthening institutional coordination, scientific data and climate information systems, and financing mechanisms to support sectoral adaptation. Importantly, it helps Bhutan align national adaptation planning with its Climate Change Policy (2020) and the Second Nationally Determined Contribution (2021).

1.3.12 Water Act of Bhutan, 2011

The Water Act of Bhutan, 2011 provides the legal framework for the protection, conservation, development, and sustainable management of water resources in Bhutan. The Act recognizes water as a public trust and a vital national resource, ensuring its equitable and sustainable use for present and future generations. The Act establishes principles for integrated water resources management, regulates water abstraction and pollution, and sets out institutional roles for water governance at national and local levels. It also provides for the protection of watersheds, water sources, and water quality, while promoting efficient water use, conflict resolution, and environmental sustainability in line with Bhutan's development and conservation priorities.

1.3.13 Mines and Mineral Act of Bhutan 1995 and Regulation

The Mines and Minerals Act of 1995 provides the legal framework for the exploration, extraction, management, and conservation of mineral resources in Bhutan. It recognizes minerals as a state-owned resource and aims to ensure their sustainable utilization while safeguarding the environment and supporting national development. The Act establishes licensing and permit systems for prospecting, mining, and processing of minerals, defines the roles and responsibilities of regulatory authorities, and sets out procedures for revenue collection, royalty payments, and enforcement of compliance. The Mines and Minerals Regulations operationalize the Act by detailing application procedures, safety and environmental standards, reporting requirements, and penalties for violations. Together, the Act and its Regulations aim to balance economic development, environmental protection, and responsible resource management in Bhutan.

1.3.14 Economic Development Policy of Bhutan 2016

The Economic Development Policy of Bhutan outlines the nation's strategy to achieve sustainable, inclusive, and equitable economic growth while maintaining the country's unique cultural heritage and environmental conservation priorities. Rooted in the philosophy of Gross National Happiness (GNH), the policy emphasizes that economic development must contribute not only to income generation but also to social well-being and ecological balance. Key objectives include diversifying the economy, promoting private

sector development and entrepreneurship, fostering rural development, enhancing human capital and skills, and ensuring sustainable use of natural resources. The policy also encourages investment in infrastructure, innovation, and trade, while prioritizing environmental stewardship and social equity. Overall, it provides a roadmap for Bhutan to achieve balanced economic growth that aligns with its development philosophy and long-term national goals.

1.3.15 National Biodiversity Strategy and Action Plan of Bhutan, 2025

The National Biodiversity Strategy and Action Plan (NBSAP) of Bhutan is a strategic framework aimed at conserving biodiversity, promoting sustainable use of biological resources, and ensuring equitable benefit-sharing. Aligned with the Convention on Biological Diversity (CBD), the NBSAP integrates Bhutan's development priorities, traditional knowledge, and conservation commitments into a coherent national plan. The strategy focuses on ecosystem and species conservation, habitat restoration, and protection of genetic resources, while emphasizing community participation and mainstreaming biodiversity into sectoral policies such as agriculture, forestry, and tourism. The Action Plan outlines priority activities, targets, and institutional responsibilities to achieve these goals, ensuring that biodiversity contributes to both environmental sustainability and socio-economic development in Bhutan.

1.4 Purpose and Objectives

1.4.1 Vision

A Sustainable Forest Ecosystem for the People, Nature, and Economy

1.4.2 Mission

To conserve and manage Bhutan's natural resources through the adoption of innovative technologies to ensure socio economic and environmental well-being, while maintaining a minimum 60% of the land under forest cover for all times to come.

1.4.3 Purpose

To contribute towards the overall vision and mission of the Department of Forest and Park Services, Divisional Forest Office, Thimphu comes out with this management plan to conserve forest ecosystem by clearly outlining the targets, implementation timeframe and financial requirement during the next 10 years.

1.4.4 Objectives

The objectives of the DFO management plan for the IKI landscapes of DFO Thimphu are;

- To enhance effective service delivery through development of technical capacities of staff with improved infrastructure and equipment
- To ensure sustainable management of forest resources and generate revenue

- To ensure biological integrity of flora and fauna through periodic assessment and monitoring
- To enhance sustainable forest management through community participation and income generation towards improving community livelihood
- To combat the adverse impacts of climate change on forest ecosystems and foster coexistence between humans and wildlife

Chapter 2:

Current status

2.1 Boundary and Area

Thimphu Forest Division covers a total area of 876.412 sq.km. It stands between N27°12' to N27°48' latitudes and E89°24' to E89°48' longitudes. It spans across six gewogs under Thimphu Dzongkhag namely: Chang, Dagala, Geney, Kawang, Mewang and a small portion of Naro Gewog with an area of 5.76 sq.km. Administratively, it delivers forestry services through four field offices spread across four strategic locations as indicated in table 1. It shares its boundary with Wangdue Division to the east, Paro Division to the West, Jigme Dorji National Park to the north, Gedu and Dagana Divisions to the south (figure 1).

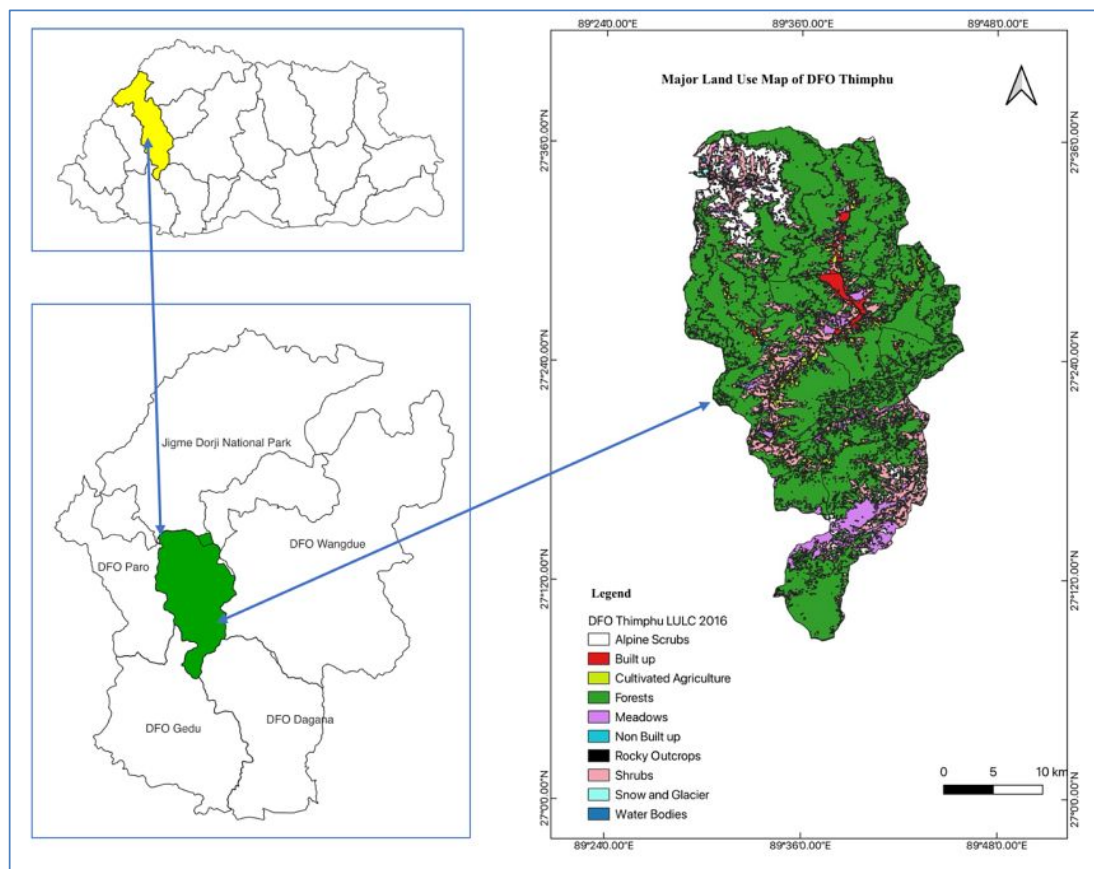


Figure 1: Location map of DFO Thimphu with its adjoining boundaries and major land use type

Like in most parts of the country, Thimphu is located on the mountainous slopes. The altitude ranges from 2100m to 6800m. The slope ranges from 0-70. While moderate slopes are sparse, they are mostly confined along the river valleys. The topography

becomes steeper at higher elevations towards the north in scarified alpine cliff edges. Because of very rugged terrain in the northern part of the division, the cultivated agricultural land is limited. Most of the cultivated agricultural land are located in the southern part and along the Wangchu valley.

Thimphu valley is dominated by its main river, the Wang Chhu, which is fed by glaciers at around 6000 meters above sea level. As it traverses south, it is joined by several important tributaries. Chief tributaries among these is Bjemi Rong Chhu in Mewang gewog, Ola Rong Chhu in Chang and Geney Rongchu in Geney geog. These are fed by snow-capped mountains, lakes and springs. The northern regions are dotted by several lakes. Some of the prominent ones include Dung Tsho, Janya Tsho and Bjemi Lang Tsho. Such a wide range of water bodies provide a rich network of watersheds. It is part of the Wangchhu basin, where it joins the Ha Chhu and Paa Chu, covering a total area of 4,596 km², almost 12% of the country. It serves as a lifeline not only to the people of Thimphu but also the country as it is used to power the Chukha and Tala Hydropower stations generating a total of 1356 MW of electricity.

The climate in Thimphu follows the four seasonal cycles. In general, it starts from the moderate spring followed by warm and wet monsoon, cool autumn, and cold winters. Temperature can drop up to -3.3°C to -5°C in the coldest months depending on the altitude. These are characterized by freezing nights, frosty mornings, and the occasional annual snow fall. June to August is considered the hottest months with temperatures rising to about 25°C to 30°C. Mean annual precipitation ranges from 0 mm per month during dry seasons to 144mm in monsoons. Light to moderate showers begin at the onset of March, corresponding with the coming of Spring. The monsoon starts at the start of June and extends up to August, where it receives more than 60% of the total annual rainfall. The precipitation gradually tapers off at the end of September as it gives way to colder climate.

2.2 Administration

2.2.1 Administrative Set-up

Thimphu Forest Division provides forestry services to the public of the six gewogs under Thimphu Dzongkhag. This includes Chang, Dagala, Geney, Kawang, Mewang and Naro. Administratively, forestry services are also provided to Thimphu municipal area, in collaboration with Thimphu Thromde.

Within the Division, there are two Range offices located at Thimphu and Khasadrapchhu and two Forest Management Units located at Chamgang and Gidakom. Thimphu Range Office is one of the oldest range offices under the division catering forestry services to Kawang and Chang Gewogs, which are covered by its four Beat Offices spread across Dechencholing, Langjophakha, Simtokha and Hongtsho. This Range Office also caters services to urban residents of Thimphu Thromde.

Khasadrapchu Range office looks after forestry services for Geney through a beat office located at Geneykha and three chiwogs of Mewang Gewog viz Namseling, Sisisna and Khasadrapchu. Likewise, Gidakom FMU covers two Chiwogs of Mewang viz Tshaluna and Bjemina and caters services to yak herders of Naro Gewog who migrate down to

lower elevation during winter season. Similarly, the Chamgang FMU caters forestry services to five chiwogs of Dagala Gewog.

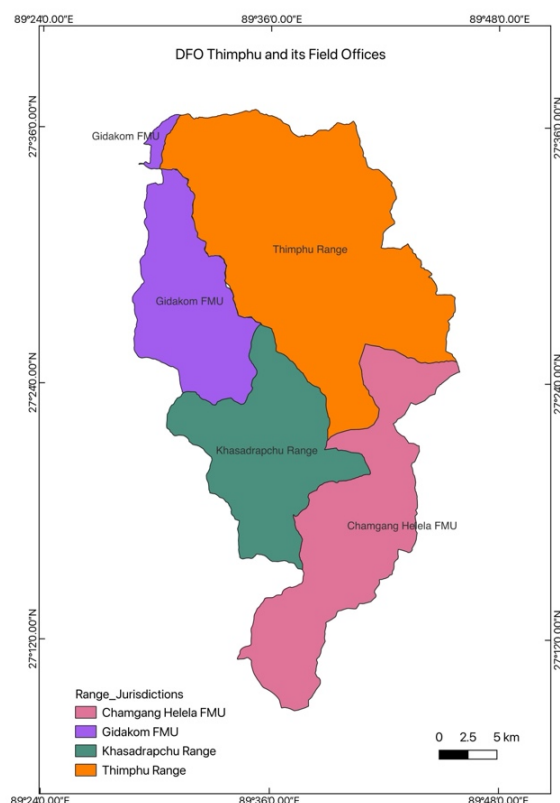


Figure 2: DFO Thimphu and its field Offices

Table 1: Field offices and service areas

Name of Office	Beat Offices	Jurisdiction/Service area
Khasadrapchu Range	Genekha	Namseling, Khasadrapchu and Sisina Chiwogs of Mewang Gewog and Geney Gewog
Thimphu Range	Dechecholing Hongtsho Langjophakha Simtokha	Kawang Gewog Chang Gewog Thimthrom
Chamgang FMU	-	Dagala Gewog
Gidakom FMU	-	Tshaluna, Bjemina Chiwogs of Mewang Gewog and a small portion of Naro Gewog with no permanent settlement

Within the Division there are three technical sections which are aligned to the three Functional Divisions of the Department.

Forest Resource Planning and Management Section looks after sustainable manage-

ment and utilization of forest resources for commercial and rural requirements in line with FNCA and FNCRR. This is done through planning and implementation of different management regimes such as forest management units, community forest management areas, non-wood forest management areas and local forest management areas. It is responsible for the preparation and review of the Forest Management Plans, Operational Plans for the Forest Management Units, Community Forest Management Plans and Local Forest Management Area Plan including Non-Wood Forest Management Plans. Additionally, this section coordinates with different agencies in plantation programs including prevention of forest fires, pests and diseases. Conducting of awareness and sensitization to the public on forest fires including coordination of forest fire suppression through mobilization of fire fighters is one of the important mandates of this section. Forest fire management includes creation of fire lines, conduct damage assessment, disposal of damaged forest resources and reforestation of burnt area. Similarly, it is also responsible for planning and implementation of scientific thinning activities including export facilitation following due verification process.

Forest Monitoring and Information Section is mandated to look after forestry clearances required for all developmental activities on state reserved forest land (SRFL) including land acquisition for various developmental projects such as land lease, acquisition, road, transmission line, irrigation channel/water pipeline, archery range and related activities as per requirement and provisions in the Forest and Nature Conservation Rules and Regulations of Bhutan. It is also responsible for monitoring all the existing management regimes including resource utilization and wood-based industries. Similarly, it is also mandated to review rural timber applications applied through G2C portal. It also serves as the data repository through Forest Information Reporting and Monitoring System (FIRMS). It is also responsible to mobilize human resource and monitor the forest check post under the division HQ with additional mandate to deal with forest offence cases forwarded to the Division HQ from the field offices.

Further, this also ensures prompt and complaint free public services within reasonable turnaround time. It also coordinates and upscale SMART patrol tool in the division through technical backstopping to the field offices on regular basis. Similarly, it is responsible to facilitate timely settlement of the forest offence cases referred to the division from field offices and forest check post. It shall also serve as the focal point for waste management.

Nature Conservation Section is mandated to look after biodiversity conservation programs including national and divisional level surveys on priority flora and fauna. With the increasing Human Wildlife Conflict issues both at national and district level, this section is also mandated to coordinate appropriate mitigation interventions with technical support from Nature conservation Division, Department of Forest and Park Services. The section also looks after wildlife offence cases requiring legal prosecution as per Forest and Nature Conservation Act of Bhutan 2023. It is also responsible for coordinating wildlife rescue and rehabilitation activities. This section is also responsible for annual monitoring of Biodiversity Monitoring Grids covering all the taxa (Plants, Mammals, Birds, Herpetofauna, Insects and Fish) and reporting to Department.

Administration Section is responsible for the processing of promotion, transfer, training, leave, personal files, new recruitments, etc. It is also responsible for maintaining records of leave, and personal files. It coordinates with various field in-charges to attend

to grievances and facilitates the timely awarding of welfare grants. The section ensures the timely submission of performance evaluation reports, IWPs, Annual Asset Declaration, Leadership feedback etc.

Accounts Section which is clubbed under Cluster Finance Division of the MoENR functions to prepare budget proposals for the planned activities of the division in coordination with sections and field offices. It is responsible for timely disbursement of salaries, entitlements, allowances, payments, and monthly remittances to financial institutions. In addition, this section is responsible for the preparation and submission of financial reports.

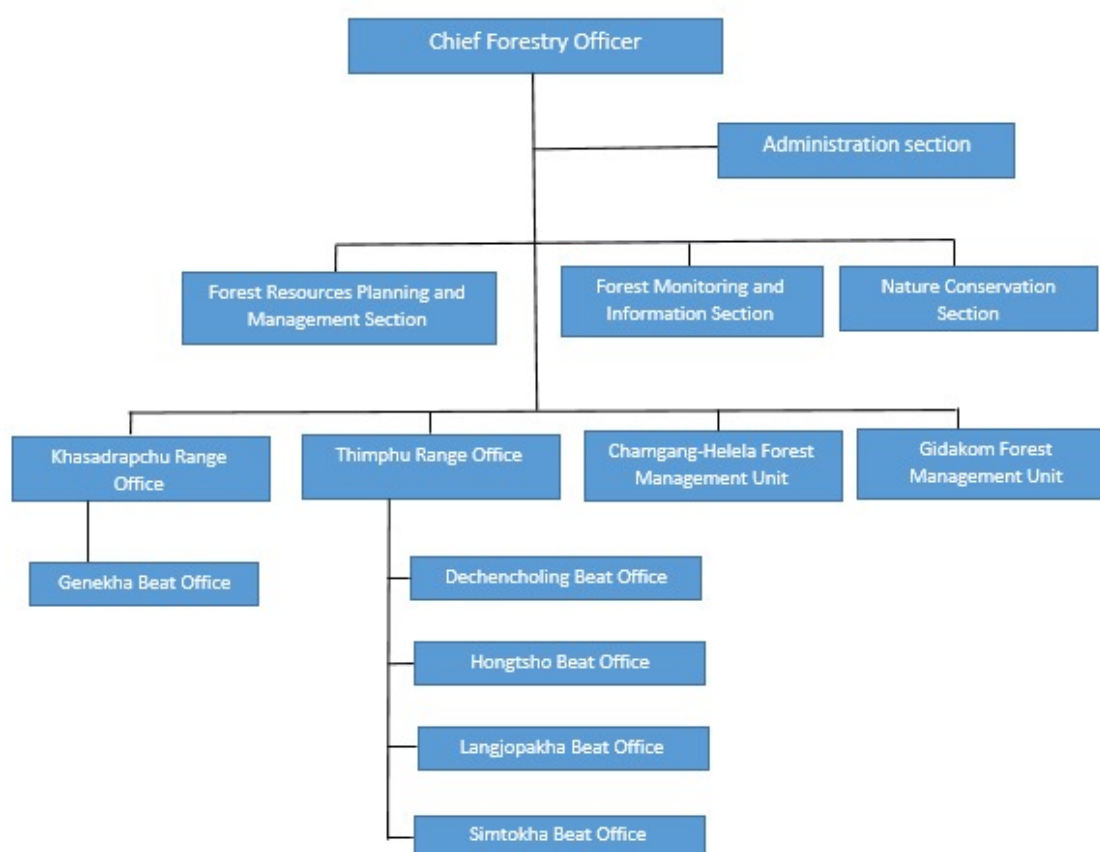


Figure 3: Organogram of the division

2.2.2 Mandates

1. Conserve and manage natural resources including biodiversity, forest and water resources through science and research-based actions;
2. Sustainably utilize and promote optimal allocation of forest resources as per approved management plans;
3. Conduct periodic monitoring and evaluation of natural resources to ensure sustainability;
4. Control illegal timber harvesting and wildlife poaching including exploitation of NWFP resources through implementation of standing rules, regulations and guidelines;
5. Develop and implement plans to effectively mitigate human-wildlife conflict;

6. Maintain a viable population of fauna species through periodic patrolling, enforcement, rescue and rehabilitation, and awareness programs;
7. Provide efficient and effective forest related public services to facilitate developmental activities and fulfill public aspirations;
8. Promote participatory approach in the conservation and management of natural resources focusing on enhancement of rural livelihoods;

In a nut shell, the mandates of the division can be summarized into Conservation of forest ecosystem/biodiversity and deliver efficient forestry services to enhance community livelihood.

2.2.3 Human Resource

In line with the approved staffing pattern for the division, there are a total of 87 numbers of staff. These include 56 technical staff, 1 Administrative Assistant, 4 drivers and 26 Elementary Support Personnels who provide key services. Most of the staff are dominated by S and SS categories accounting for 52 of the total staff. These are complemented by 5 numbers of PMCs providing a good balance. In terms of qualification for the technical staff, two staff members under the Division has a Masters degree, 3 with a bachelor's degree, 14 Diploma and 38 certificate level course.

Working experience among the staff as of July 2024 ranges from 3 to 38 years while the mean working experience of the existing staff stands at 23.4 years. Within the technical category, there are 18 female employees accounting for 32% representation. The staff with 30 and more working years are completely dominated (100%) by males. Meanwhile, there are 16 male and 13 female between 20-29 years of service, of which 44.8 percent represents female.

These figures ensure a good working balance between youth and experience enabling us to efficiently deliver our mandates. Coupled with field experience, many of the staff have undergone trainings in various domain ranging from online forestry services, forest survey, wildlife rescue, GIS application, drone operation, SMART patrolling, Habitat management, plantation and nursery management, Monitoring and Evaluation of management Regimes, legal documentation for wildlife crime prevention, prevention of forest fire, research and survey methodologies etc which are critical for delivering efficient forestry services.

Despite diverse field experiences and numerous trainings being imparted, there are several challenges and issues that hinder service delivery and fulfillment of mandates. Firstly, most of the senior existing staff are not able to cope up with the new technologies such as drone operations, GIS tools, web-based service platforms (Online Forestry Services) etc. Thimphu being the capital city, the DFO Thimphu has to cater to over 100000 people, which is one of the highest populations in the country. These are exacerbated by the presence of 17 wood-based industries, especially under Thimphu Range and Gidakom FMU, which demand dedicated personnel to provide efficient services and prevent illegal activities. Furthermore, many of our staff are continually required to perform many adhoc activities beyond the Division's mandates. Similarly, with rising human-wildlife conflicts and wildlife entering into human settlement, the cases for wildlife rescue operations also increased further encumbering our staff.

In addressing these challenges, there is a critical need to enhance the staff strength under the Division through proper rationalization of the workload. There are also opportunity to enhance the IT literacy, including but not limited to Microsoft office, GIS and GPS, data analysis and SMART patrolling. Similarly, further training is required in wildlife behavior, proper release techniques and health and safety protocols to ensure that wild-life rescue operations are carried out in a manner that is safe for both the animals and the handlers.

Table 2: Staff strength of the division

Office	PMC	SS	S	O	ESP	Total
Division HQ	4	3	4	2	1	14
Chamgang FMU	0	4	2	0	0	6
Gidakom FMU	0	2	5	0	0	7
Khasadrachhu Range	0	2	8	0	0	10
Thimphu Range	1	7	13	1	17	39
Royal Takin Preserve	0	1	1	1	8	11
Total	5	19	33	4	26	87

2.2.4 Infrastructure

The Division's headquarter in Thimphu is centrally located making it ideal for the general public to avail its services. Its proximity to the Department and other Functional Divisions allows prompt communication. Likewise, Range Offices and FMUs and Beat Offices are strategically located. The Division along with all its field offices are equipped with electricity, internet, and telecommunication facilities with the exception of Dechencholing Beat Office. The Division, for the most part, is equipped with computer and laptop facilities enabling its employees to deliver forestry services through the online forestry services. Also, most of our staff members are equipped with GPS and smart phones aided by good telecom coverage allowing for data collection and submission in real time. However, most of the computers and laptops are old which hinder smooth service delivery.

The Division has three Hilux as pool vehicles, of which two is placed under Division HQ and one under Thimphu Range office. Additionally, there are also four bikes (2 in Gidakom FMU, 1 in Chamgang FMU and one in Genekha Beat office). These facilities are currently used for fieldwork, patrolling and wildlife rescue operations. However, all the pool vehicles are old requiring frequent maintenance and the lack of adequate fund for fuel and maintenance hamper our service delivery and conservation efforts.

One of the key issues faced by the Division is in the delivery of its mandate of providing enabling environment for wildlife conservation and protection through rescue operations and rehabilitation programs. Although basic wildlife rescue equipment has been provided by the Department, there is a need for critical equipment such as search light, safety equipment and drug storage facilities. Likewise, the centralized wildlife equipment housed at the Division HQ can be further reinforced by additional sets in the field offices to facilitate prompt rescue actions. With growing HWC cases, there is a lack of rehabilitation centre and limited sites to release and relocate the rescued animals especially bear and cat species.

2.2.5 Budget and Revenue

Looking at the budget allocation for the Divisional Forest Office across four categories over two financial years, 2022-2023 and 2023-2024, the maximum allocation in both the years was for Personal Emoluments, with 43.817 million in 2022-2023 which was slightly reduced to 42.355 million in 2023-2024. A slight decrease in personal emoluments was observed as few staff went on Extraordinary Leave. However, it is observed that a substantial portion of the total budget is allocated to staff salaries.

Conversely, the minimum allocation was observed for Conservation Activities, with a mere 0.385 million Ngultrum in 2022-2023 which increased significantly to 4.06 million Ngultrum in the following financial year. This sharp upsurge highlights increased investment in conservation-specific initiatives in the division.

For Operations and Management Services, the budget declined from 4.856 million in FY2022-2023 to 3.837 million in FY2023-2024. However, Monitoring and Mobility of Staff saw an increase, rising from 4.166 million in FY2022-2023 to 6.727 million in FY2023-2024. This increment suggests a growing emphasis on staff oversight and mobility-related needs.

Overall, the trend shows a consistent budget allocation with incremental increase for Conservation Activities and staff mobility. Despite the slight dip in the largest allocation for personal emoluments, it remains the predominant expense. The shifting budget priorities could reflect changes in operational strategies or emerging needs within the division.

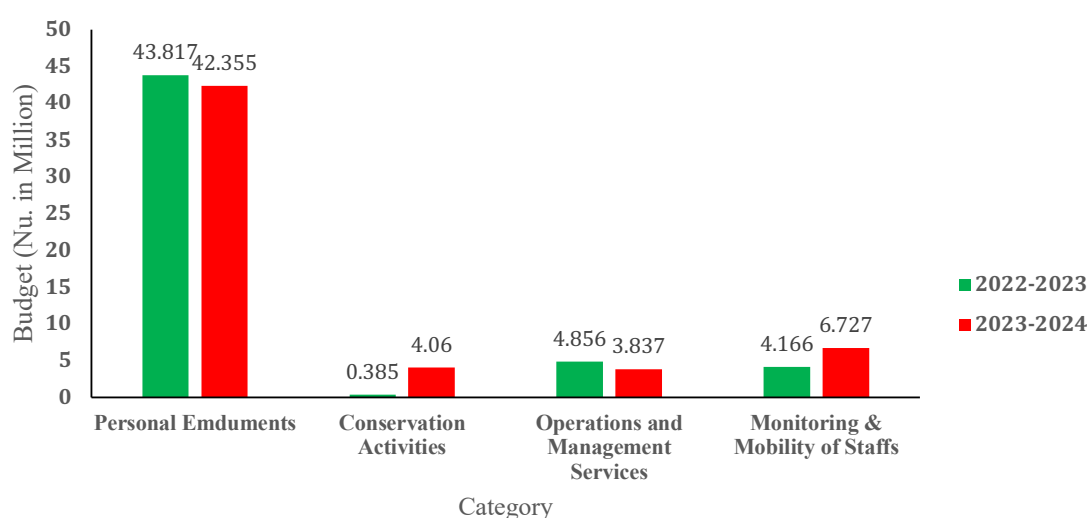


Figure 4: Budget allocation for the division during past two financial years

The figure on revenue collection from various sources for the past five years (July 2019 to June 2024) measured in million ngultrum highlights the contributions from different revenue streams. Some of the key observations include:

- The allotment of timber in different forms generated the highest revenue, exceeding 8 million Ngultrum. This underscores timber as the most important source of revenue, indicating increasing demand on timber;

- Fines and penalties rank second, with generating revenue of Nu. 5 million. This suggests a proactive enforcement mechanism in place for forest regulations, with significant contributions coming from fines and penalties;
- Compensation on forest offenses and timber in log form contributed significantly, both contributing close to Nu. 3 million each;
- Timber allotment in sawn form and standing form followed closely, emphasizing timber products' consistent demand and revenue potential;
- Other notable contributors include fishing permit fees, marking fees, and from firewood with collections as high as Nu. 2 million;
- Revenue from sources like registration fees (Primary and Secondary WBIs), mobile sawmill registration fees, power chain registration fees, and non-wood forest produce (NWFP) remained negligible.

The data highlights the dominance of revenue generation from timber. Comparatively high revenue from fines and penalties also implies stringent enforcement of forest regulations. Non-timber forest products and service fees play a minor role in overall collections.

The revenue structure indicates a dependency on timber-related activities, both legal and regulatory, as primary income drivers. While fines reflect strong governance, the reliance on timber may raise sustainability concerns. To diversify, there could be potential in promoting non-timber forest products and innovative service-based revenue collection.

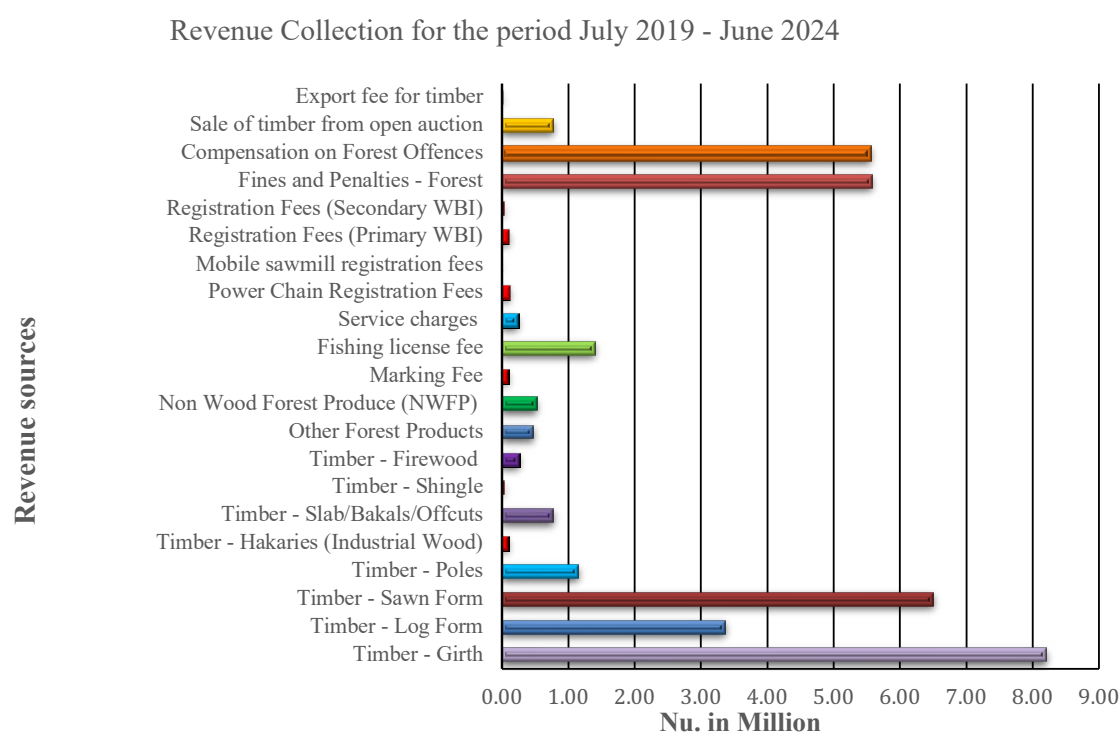


Figure 5: Revenue collection of the division during the past five years

2.3 Biodiversity Conservation

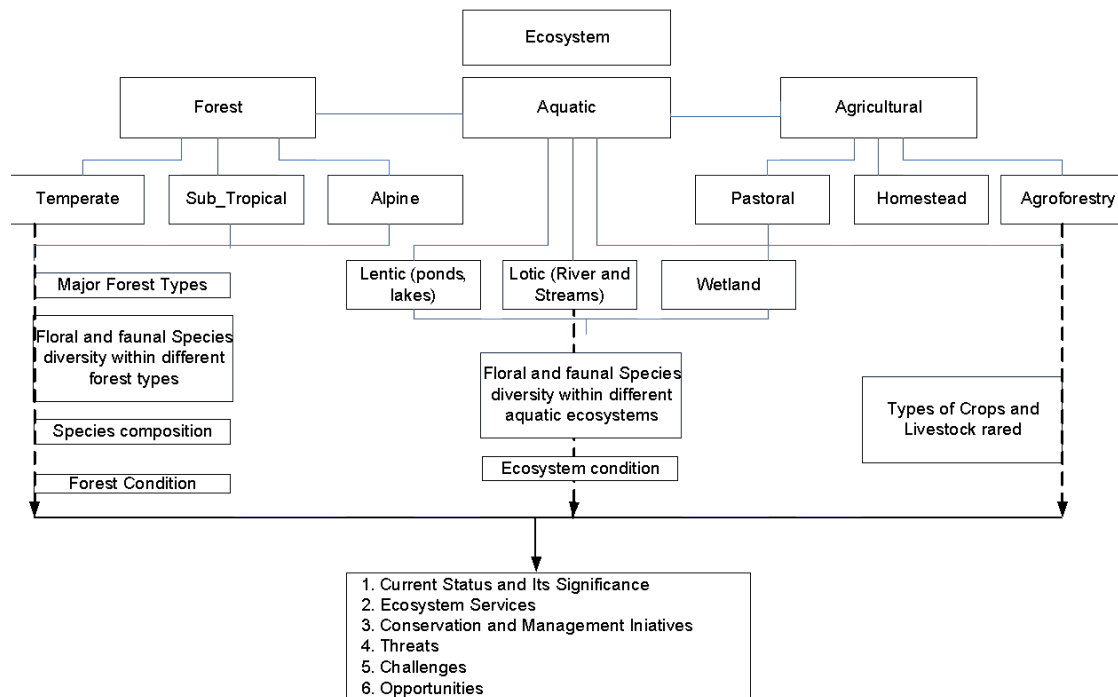


Figure 6: Thematic representation of major ecosystems

To obtain a comprehensive understanding of biodiversity across the division measuring an area of 876.412 sq.km, a Rapid Biodiversity Assessment (RBA) was conducted following the Biodiversity Monitoring Protocol developed by the Nature Conservation Division (NCD), Department of Forests and Park Services (DoFPS). Out of the 58 Biodiversity Monitoring Grids (BMG), 17 grids were sampled for the RBA focusing on flora and avifauna.

Those 17 grids were strategically selected to represent the five habitat types, employing a stratified random sampling approach (figure 7).

The collection of floral data involved enumeration of four plots at each of the 17 grids. Similarly, data on Avifauna was gathered from all the 17 grids using the MacKinnon species listing method by deploying a standardized format developed in the Epicollect5.

It is noteworthy to mention that mammal data was not collected during the survey, as comprehensive information is already available from the National Tiger and Snow Leopard Surveys conducted at the national level. Likewise, data on other taxa were extracted from available documents on the existing management regimes such as FMU plans and CF plans.

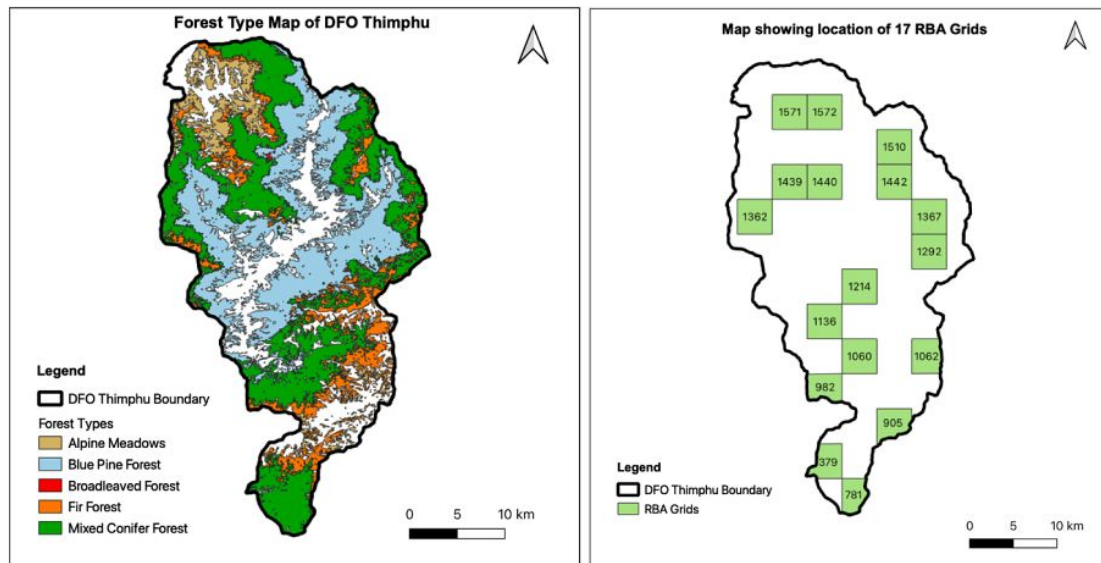


Figure 7: Samling grids spread across division area

2.3.1 Forest Vegetation

A total of 68 plots (four plots at each of 17 grids) were covered to collect data on trees and shrubs found within (20mx20m) major plots. Similarly, data on ground vegetation and regeneration were collected from all the 68 minor plots measuring 2mx2m plots established within the major plots spread across all the five habitat types. The data collection was done using the survey form developed in the EpiCollect5 and navigation to plot was guided by SW Maps.

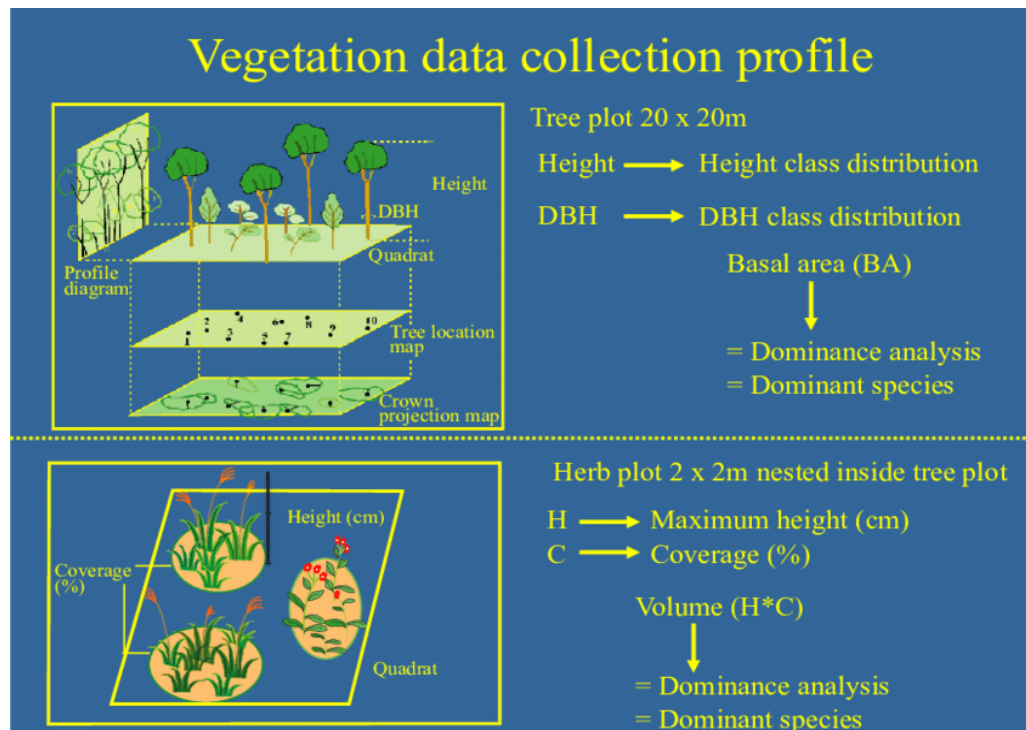


Figure 8: Design of vegetation sampling for trees and ground cover (NCD, 2020)

Data collected from the field was compiled and processed using PivotTable of the Microsoft Excel 2016 and PC-ORD version 5.10 for vegetation analysis. For the species richness, evenness index and index of dominance, Shannon-Wiener index was used.

A total of 79 species of trees and shrubs were recorded where blue pine was found to be the most dominant species followed by *Quercus semecarpifolia* (refer figure 9).

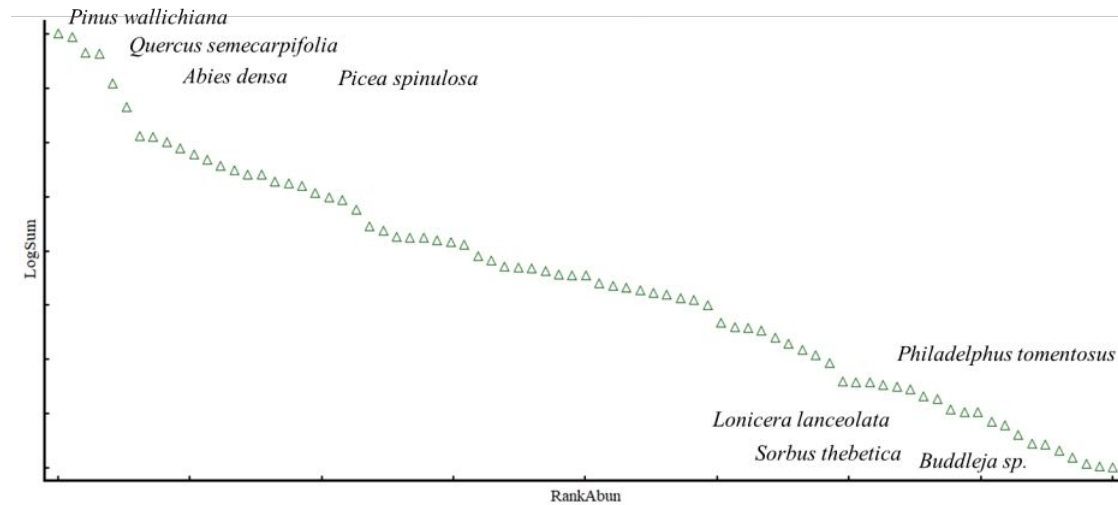


Figure 9: Dominance curve showing 79 species ranked on abundance from highest to lowest

Similarly, those trees and shrubs represent 28 families where Rosaceae and Ericaceae are found to have more species (13 under Rosaceae and 11 under Ericaceae). Fourteen families are found to have only one species each (refer figure 10).

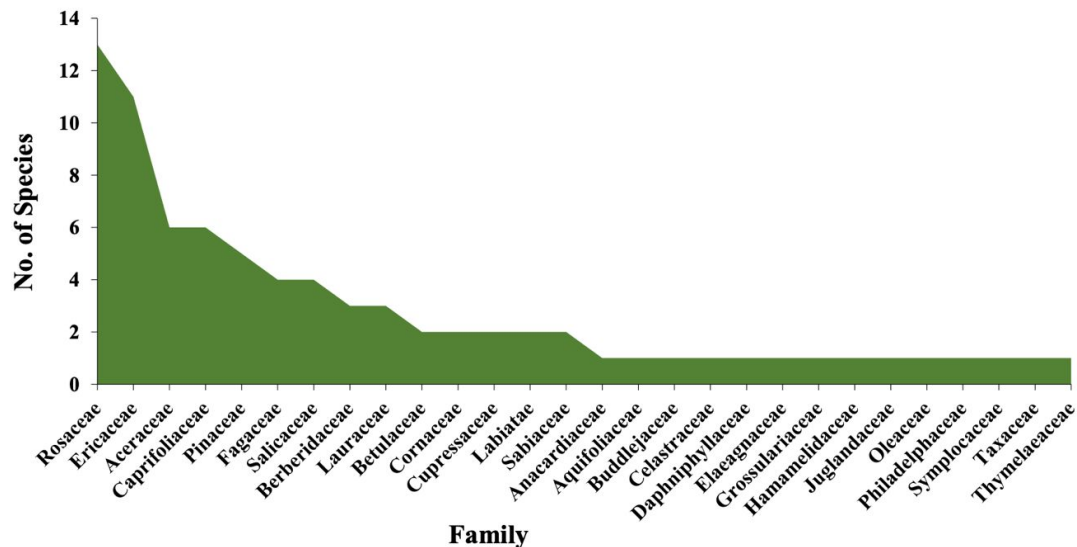


Figure 10: Family distribution of trees and shrubs

Tree Species Accumulation Curve

The species accumulation curve was generated based on Relative Sorensen (Bray-Curtis Method). The curve did not flatten completely (figure 14), indicating a requirement of more sample efforts to get higher diversity composition in the study area. The first-order jackknife estimates 117 species while the second-order estimates 138 species in the survey area against the 79 species actually recorded during the rapid assessment exercise. Of the total species recorded, 39 species showed only one occurrence while 18 species showed two occurrences.

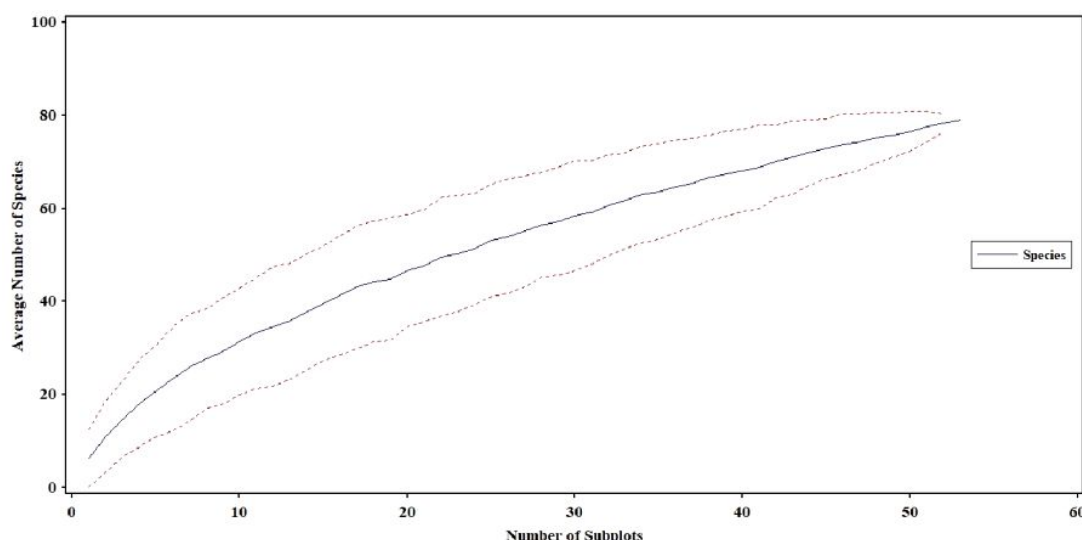


Figure 11: Species-area curve showing likelihood of recording additional species by increasing sampling effort

Stem Density

The assessment revealed that the highest stem count was recorded in Blue Pine (BPF) with 1000 stems per hectare followed by Mixed Conifer Forest (MCF) with 850 stems per hectare. The lowest stem count was recorded in Broad Leaved Forest (BLF) with as low as 100 stems per hectare. The Fire Forest (FF) also recorded as low as 200 stems per hectare. Contrary to this observation, the highest stem density was recorded in Fir Forest at 1100 stems per hectare followed by 1050 stems per hectare in Broad Leaved Forest. This information therefore suggests that although stem count and density are related, they do not follow the same trend revealing the complexities in the natural forest (figure 12).

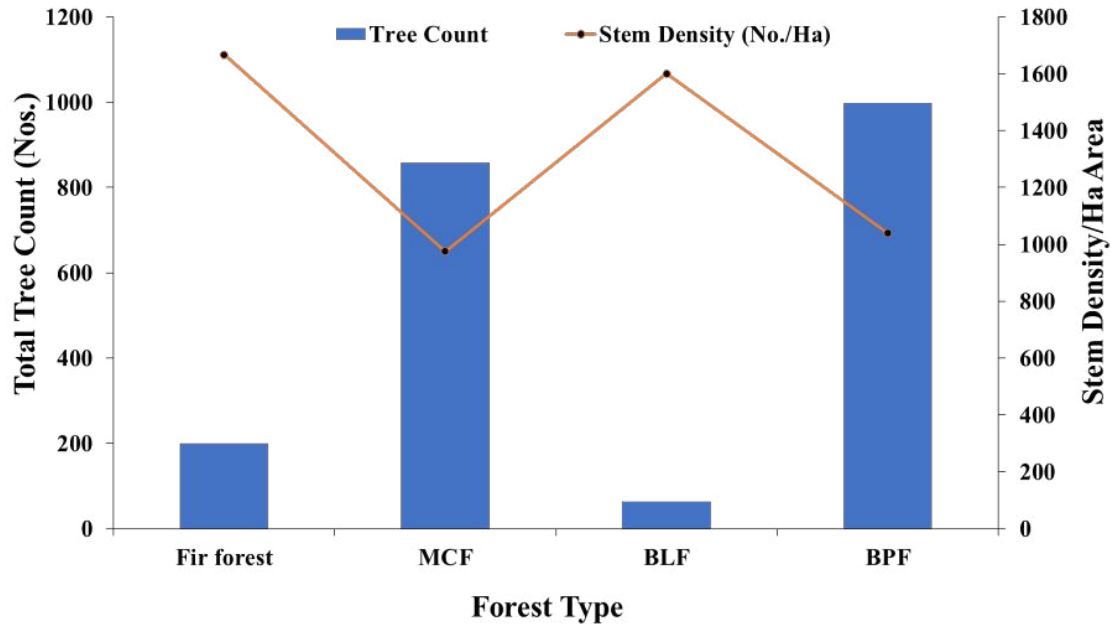


Figure 12: Stem count and density by forest type

DBH Class Distribution

The diameter class distribution offered valuable insights into the forest's structural composition and its capacity to meet both present and future timber demands. The assessment serves as a key indicator of forest health, regeneration status and sustainable productivity. The analysis revealed that the division is predominantly characterized by younger forest stands reflecting a vibrant stage of growth and renewal. Such a composition not only signifies a promising future for timber production but also aligns with the observation, where younger stands dominate the landscape. The prevalence of young forests suggests active regeneration and potential for long-term sustainability, provided appropriate management practices are implemented. This structural profile highlights the forest's resilience and its ability to continue supplying timber resources while supporting broader ecological functions. It also underscores the importance of sustainable forest management to ensure that this youthful forest matures into a productive and ecologically balanced landscape over time (figure 13 and 14).

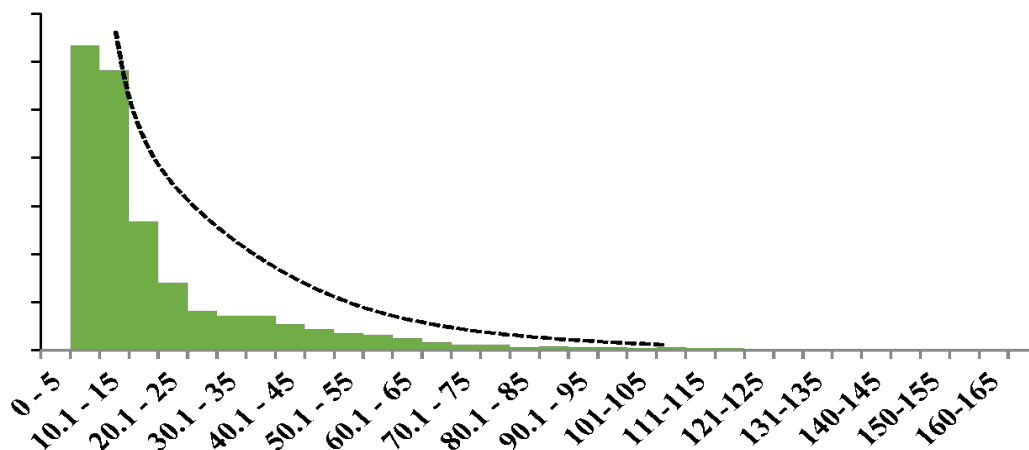


Figure 13: DBH Class distribution and age pattern

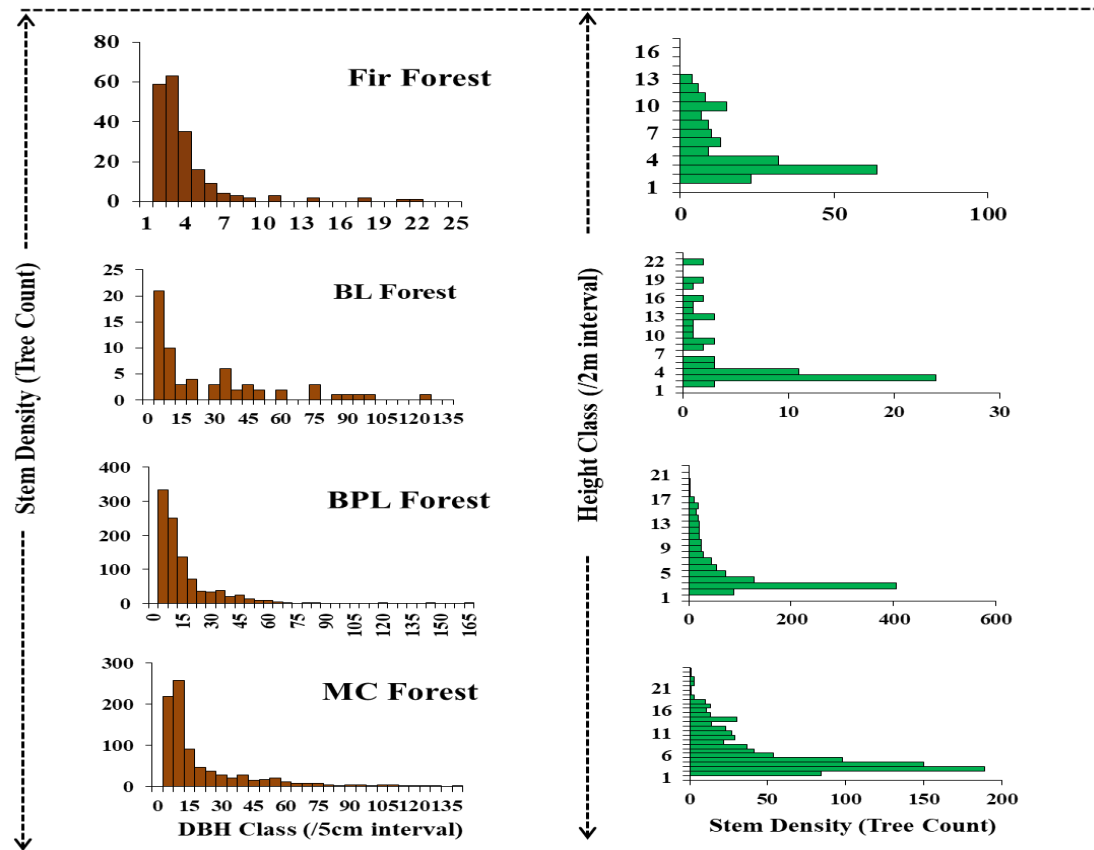


Figure 14: Forest structure and regeneration pattern by forest type

Forest Classification

Cluster Analysis using PC-ORD 5 software grouped the homogenous plant communities into a cluster of forest type zones by species similarity index value of 50% in the dendrogram. The similarity index of 50% was performed for the species using the Relative Basal Area for the species gathered from 50 plots from 15 sample grids spread across the different forest types. The cluster analysis at 50% similarity index revealed four distinct clusters or forest-type zones (figure 15).

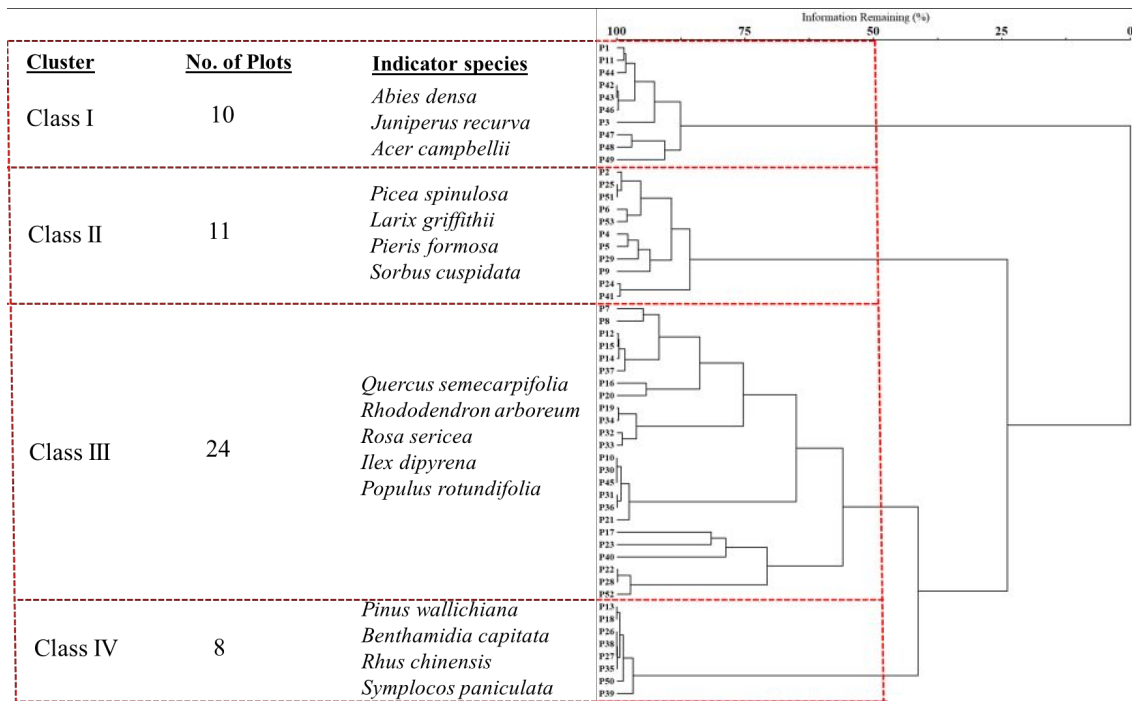


Figure 15: Cluster dendrogram based on 50% similarity index

The indicator species of Cluster I is *Abies densa* (IV = 95.1, $p = 0.0002$), *Juniperus recurva* (IV = 51.9, $p = 0.0018$), *Rhododendron cinnebarinum* (IV = 29.2, $p = 0.0646$), *Acer campbellii* (IV = 23.3, $p = 0.1188$), Cluster II is *Picea spinulosa* (IV = 85.1, $p = 0.0002$), *Larix griffithii* (IV = 27.3, $p = 0.0148$), *Pieris formosa* (IV = 19.9, $p = 0.04755$), and *Sorbus cuspidata* (IV = 18.2, $p = 0.0916$), the Cluster III is *Quercus semecarpifolia* (IV = 83.5, $p = 0.0002$), *Rhododendron arboreum* (IV = 61.9, $p = 0.0016$), *Rosa sericea* (IV = 34.1, $p = 0.0954$) and *Populus totundifolia* (IV = 17.4, $p = 0.2971$) and the Cluster IV is *Pinus wallichiana* (IV = 76.9, $p = 0.0002$), *Benthamidia capitata* (IV = 25.0, $p = 0.0184$), *Rhus chinensis* (IV = 25.0, $p = 0.0234$) and *Symplocos paniculata* (IV = 23.3, $p = 0.1164$).

Ground layer plant composition

Ground vegetation composed of 202 different types of species with 53 families which constituted perennial herb, annual herbs, climber and grasses. The dominant families recorded include Asteraceae (n=21, 10%), Rosaceae (n=18, 9%), Ranunculaceae (n=17, 8%), Polygonaceae and Primulaceae (n=11, 5%) and rest 20 families recorded one species each (Figure 16).

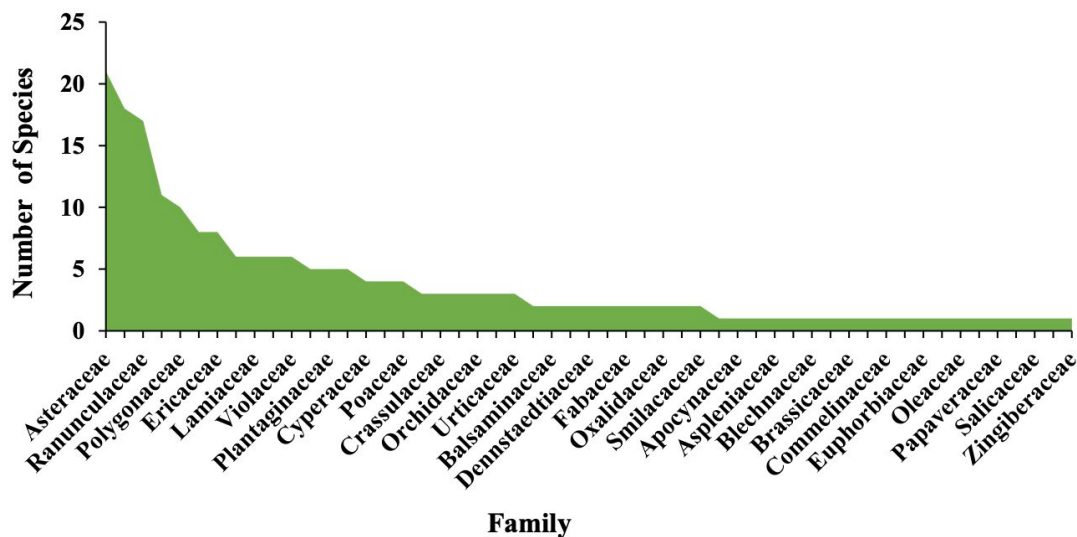


Figure 16: Family distribution of ground layer

Epiphytes

A vegetation survey was also focused on data collection on epiphytes which provides valuable insights into the diversity and distribution of these unique plants within a specific ecosystem. A total of 17 different epiphytic plants that grow on the surface of land, logs, often on trees, and on boulders were recorded during the survey. Climbers dominate the Dagala gewog constituting 89.47% of its vegetation. They are entirely absent in Kawang gewog. In Chang, Geney, and Mewang gewog, climbers exhibit significant presence, representing 60.61%, 85.29%, and 90.83% of the flora, respectively.

Ferns thrive predominantly in the Kawang gewog, comprising 98.68% of its vegetation. It is absent in the Dagala and Geney gewog. In Chang and Mewang gewog, ferns exhibit minor presence, representing 15.15% and 0.46% of the flora, respectively (figure 17).

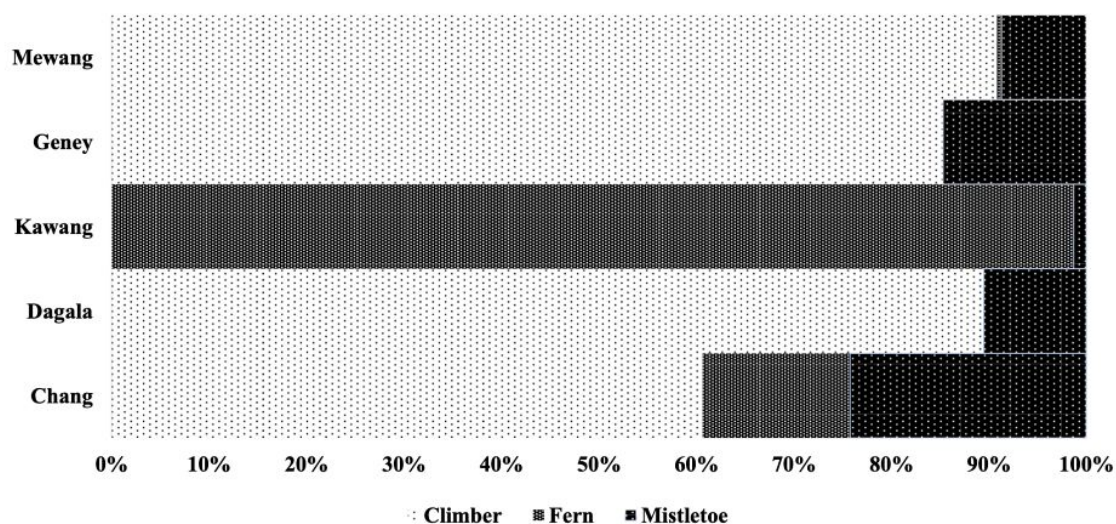


Figure 17: Epiphytes recorded under the division

However, mistletoes show a dispersed distribution across the gewogs. It exhibits notable presence in the Chang and Geney gewog, representing 24.24% and 14.71% of the flora, respectively. Mistletoes are less prevalent in Dagala and Mewang gewogs, constituting 10.53% and 8.72% of the vegetation, respectively. They are nearly absent in the Kawang representing only 1.32% of the flora.

2.3.2 Avifauna (Birds)

With significant altitudinal variation ranging from 2060m to 4743m, a total of 100 bird species were recorded during the Rapid Biodiversity Survey. This list represented 36 families as recorded from seventeen (4kmX4km) grids deploying Mackinnon's Species Listing Method.

At the grid level, which to some extent represent habitat type, Grid 15 and Grid 7 both falling within Blue Pine Forest (BPF) recorded highest diversity indices of 0.23 and 0.22 respectively. Grid 10 which also falls within the same habitat type recorded the lowest diversity index of 0.01 indicating the variation even within the same forest type.

Similarly, at the habitat level, Blue Pine Forest (BPF) and Mixed Conifer Forest recorded the highest diversity indices of (H') 0.36 and 0.35 respectively. In contrast, Broadleaved Forest and Alpine Meadow recorded the lowest diversity indices of (H') 0.21. Overall, the bird diversity index for Divisional Forest Office, Thimphu is recorded at (H') 1.37 as per the first RBA Survey executed in May-June 2023.

Table 3: Bird species richness and diversity by habitat type

Forest Type	Count	RSC %	Richness (S)	H'	Evenness (J)
Alpine Meadow (AM)	37	8.853	27	0.214	0.065
Broadleaved Forest (BLF)	31	8.853	23	0.215	0.069
Blue Pine Forest (BPF)	178	46.010	70	0.357	0.084
Fir Forest (FF)	36	10.100	27	0.232	0.070
Mixed Conifer Forest (MCF)	114	26.185	66	0.351	0.084
	396			1.369	

Based on percent relative abundance, the White-throated Laughingthrush (11%, n=88) was the most frequently recorded bird species under the division. It was followed by the Green-backed Tit (5%, n=40), Spotted Nutcracker (5%, n=37), Large Hawk Cuckoo and Oriental Turtle Dove (4%, n=31 each), and Chestnut-crowned Laughingthrush (3%, n=27). Variations in bird abundance across habitat types are likely influenced by food availability, habitat conditions, breeding seasons and survey timing. The highest species richness was observed in the family Muscicapidae (10 species), closely followed by Leiothrichidae (9 species), Phylloscopidae (7 species), while both Fringillidae and Phasianidae recorded 6 species each (figure 18).

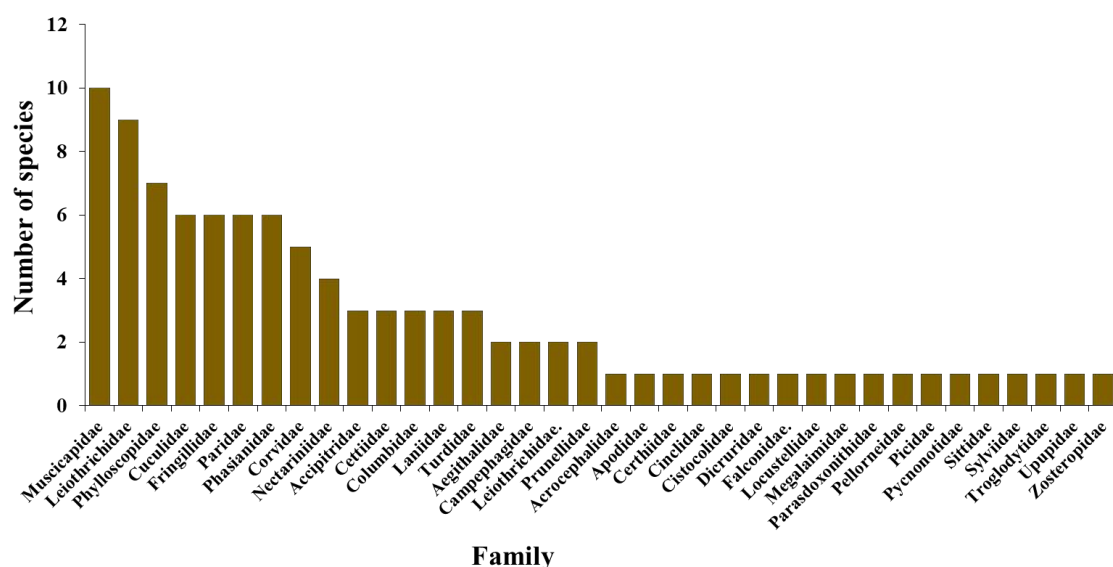


Figure 18: Bird species by family

Of the 100 bird species documented during the survey, 99% were classified as Least Concern, while the Satyr Tragopan was the only species recorded as Near Threatened under the IUCN category (refer Annexure I).

2.3.3 Mammals

For mammals, camera trap data from National Tiger and Snow leopard Survey-II were used for this formulating this plan. DFO Thimphu is found to shelter 27 mammal species distributed across 13 families. Among them, the Felidae is the most dominant family comprising six species. It is followed by Bovidae with four species, Mustelidae with three species, Canidae, Cercopithecidae, Cervidae, and Sciuridae each represented by two species. The remaining families are represented by a single species each (figure 19).

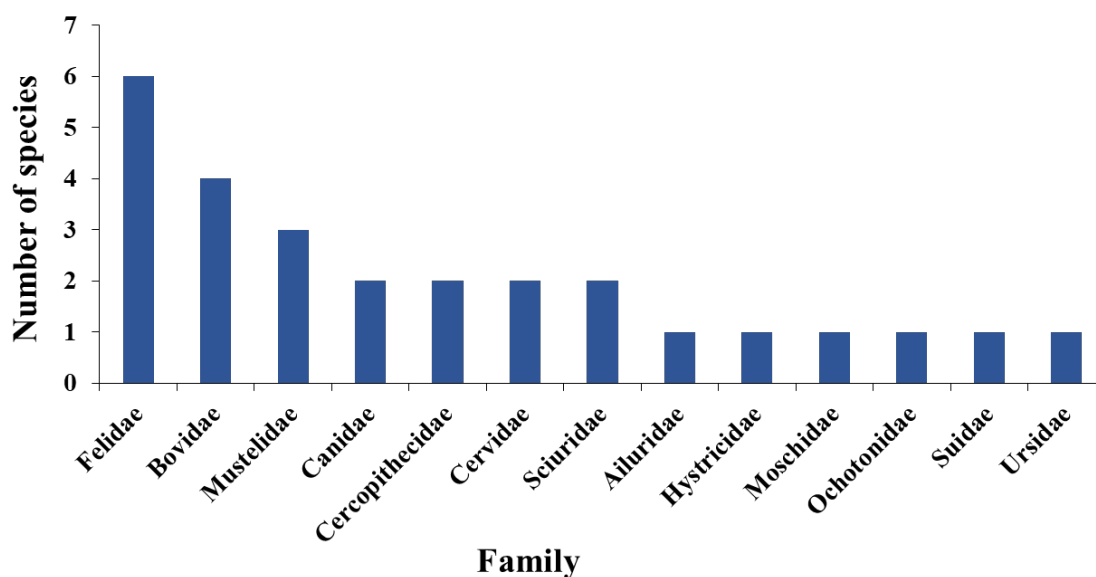


Figure 19: Mammal species count by families

Among the 27 mammals recorded, four species: Bengal Tiger, Alpine Musk Deer, Wild Dog, and Himalayan Red Panda are listed “Endangered” on the IUCN Red List. Similarly, five species namely: Snow Leopard, Himalayan Serow, Asiatic Black Bear, Common Leopard, and Bhutan Takin are classified as “Vulnerable,” while another five: Asiatic Golden Cat, Himalayan Goral, Marbled Cat, Assamese Macaque, and Eurasian Otter are categorized as “Near Threatened”. The remaining 13 species, accounting for 48% of the total, fall under “Least Concern” category. According to the Forest and Nature Conservation Act of Bhutan 2023, four species are strictly protected under Schedule I, 14 species under Schedule II and nine species under Schedule III (table 4).

Table 4: Mammal species recorded under the division

Sl	Common Name	Scientific Name	Family	IUCN Status	FNCA Protection
1	Alpine Musk Deer	<i>Moschus chrysogaster</i>	Moschidae	Endangered	Schedule I
2	Bengal Tiger	<i>Panthera tigris</i>	Felidae	Endangered	Schedule I
3	Wild Dog	<i>Cuon alpinus</i>	Canidae	Endangered	Schedule II
4	Himalayan Red panda	<i>Ailurus fulgens fulgens</i>	Ailuridae	Endangered	Schedule II
5	Snow Leopard	<i>Panthera uncia</i>	Felidae	Vulnerable	Schedule I
6	Himalayan Serow	<i>Capricornis sumatraensis</i>	Bovidae	Vulnerable	Schedule II
7	Himalayan Black Bear	<i>Ursus thibetanus</i>	Ursidae	Vulnerable	Schedule II
8	Common Leopard	<i>Panthera pardus</i>	Felidae	Vulnerable	Schedule II
9	Bhutan Takin	<i>Budorcas taxicolor whitei</i>	Bovidae	Vulnerable	Schedule I
10	Asiatic Golden Cat	<i>Catopuma temminckii</i>	Felidae	Near Threatened	Schedule II
11	Himalayan Goral	<i>Naemorhedus goral</i>	Bovidae	Near Threatened	Schedule II
12	Marbled Cat	<i>Pardofelis marmorata</i>	Felidae	Near Threatened	Schedule II
13	Assamese macaque	<i>Macaca assamensis</i>	Cercopithecidae	Near Threatened	Schedule III
14	Eurasian otter	<i>Lutra lutra</i>	Mustelidae	Near Threatened	Schedule II
15	Sambar	<i>Rusa unicolor</i>	Cervidae	Least Concern	Schedule II
16	Red Fox	<i>Vulpes vulpes</i>	Canidae	Least Concern	Schedule II
17	Leopard Cat	<i>Prionailurus bengalensis</i>	Felidae	Least Concern	Schedule II
18	Blue Sheep	<i>Pseudois nayaur</i>	Bovidae	Least Concern	Schedule II
19	Grey Langur	<i>Semnopithecus entellus</i>	Cercopithecidae	Least Concern	Schedule II

20	Barking Deer	<i>Muntiacus muntjak</i>	Cervidae	Least Concern	Schedule III
21	Wild Pig	<i>Sus scrofa</i>	Suidae	Least Concern	Schedule III
22	Yellow-throated Marten	<i>Martes flavigula</i>	Mustelidae	Least Concern	Schedule III
23	Himalayan-striped Squirrel	<i>Tamias maclellandi</i>	Sciuridae	Least Concern	Schedule III
24	Himalayan Marmot	<i>Marmota himalayana</i>	Sciuridae	Least Concern	Schedule III
25	Himalayan Crestless Porcupine	<i>Hystrix brachyura</i>	Hystriidae	Least Concern	Schedule III
26	Himalayan weasel	<i>Mustela altaica</i>	Mustelidae	Least Concern	Schedule III
27	Large-eared Pika	<i>Ochotona macrotis</i>	Ochotonidae	Least Concern	Schedule III

Based on the number of images captured on camera traps, the naïve occupancy detection rate for each species was determined (refer figure 20) which shows frequency of detection/capture on camera traps.

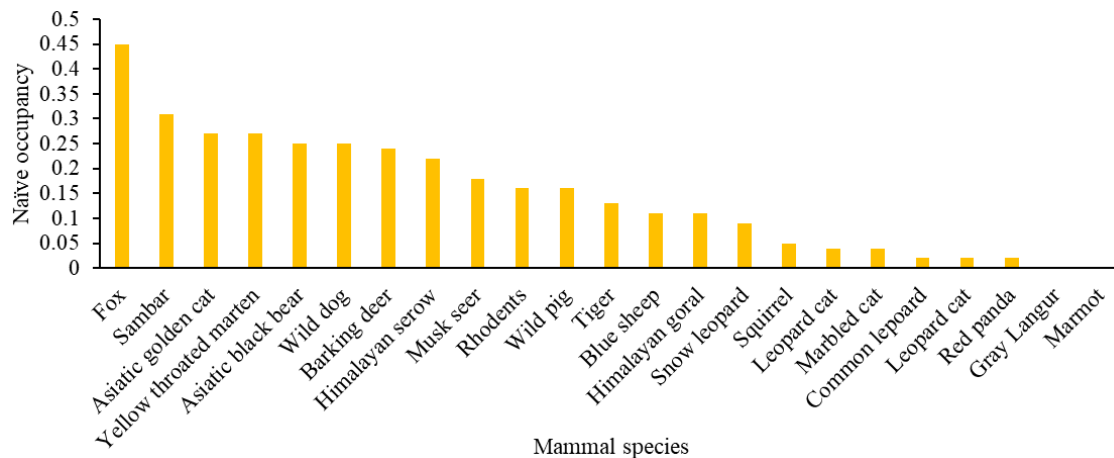


Figure 20: Naïve occupancy detection rate of mammal species

Tigers being one of the top predators in the region exhibited a Naïve Occupancy Detection Rate of 0.15 indicating their presence in about 15% of the camera trap locations. The Snow Leopard, a species renowned for its secretive behavior recorded a slightly lower detection rate of 0.10 meaning it was captured in approximately 10% of the sites. Red Foxes, with their striking appearance, showed the highest Naïve Occupancy Detection Rate among the recorded mammals at 0.45, being detected in 45% of the surveyed locations.

In terms of species diversity, the northeastern part of Kawang Gewog hosted the richest assemblage of wildlife, followed by the upper Mewang Gewog area (figure 21).

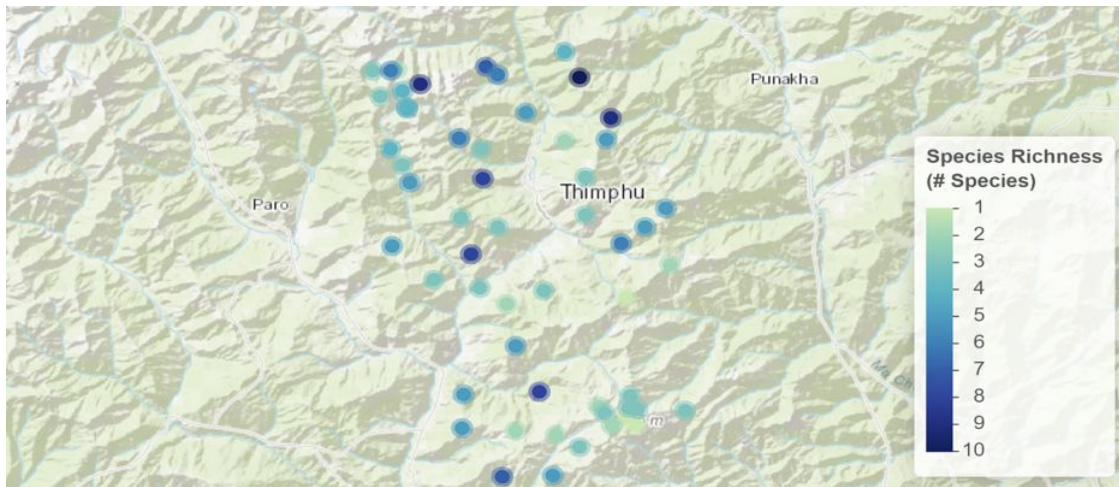


Figure 21: Mammal species detection under the division

Activity pattern of top carnivores

Tiger

Like in other parts of the country, Tigers (*Panthera tigris*) primarily prey upon four key species: Sambar (*Rusa unicolor*), Barking Deer (*Muntiacus muntjak*), Wild Pig (*Sus scrofa*), and Himalayan Serow (*Capricornis sumatraensis*). Analysis of their activity patterns revealed a predominantly crepuscular behavior with peak movements occurring at dawn and dusk (figure 22). These apex predators are highly adept hunters often taking advantage of the tranquil early hours to stalk and ambush their prey in the coolness of the morning. Their movement is most commonly recorded within the altitudinal range of 2,700–3,700 meters above sea level.

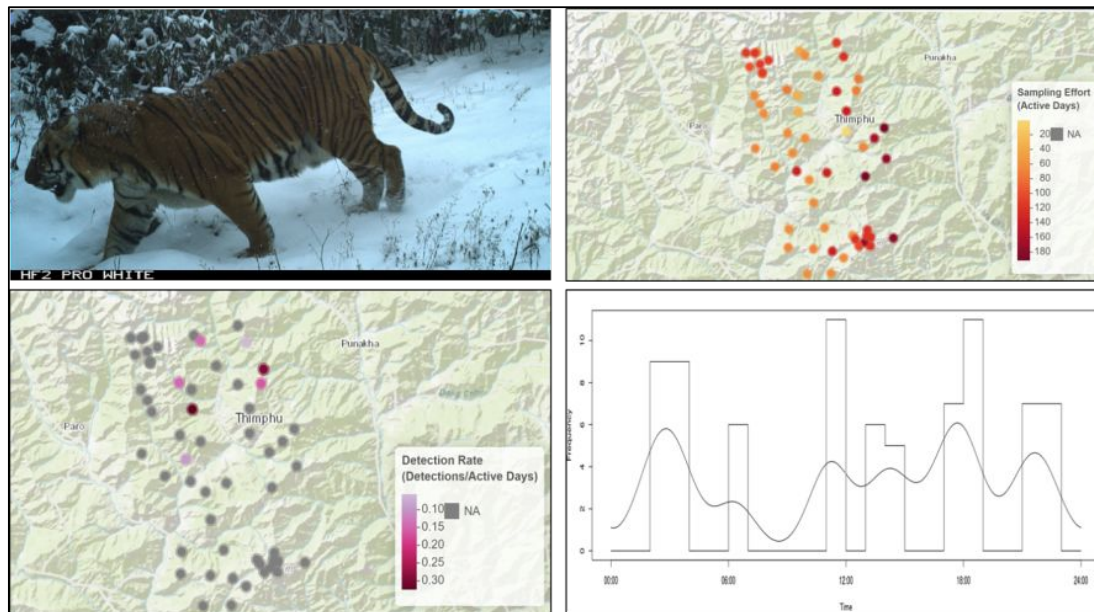


Figure 22: Activity pattern and detection of tiger

Snow Leopard

The activity pattern of the Snow Leopard (*Panthera uncia*), analyzed on a 24-hour scale using camera trap images from multiple locations, revealed a predominantly crepuscular behavior (figure 23). As opportunistic predators, Snow Leopards are found most active during the dawn hours, when the subdued light offers natural cover to aid their stealth. During this time, they often traverse the slopes and cliffs, scanning for potential prey. This crepuscular tendency is a remarkable facet of their ecology, with peak activity observed during the transitional periods of dawn and dusk. These majestic cats utilize these hours not only for hunting but also for marking their territory and engaging in social interactions.

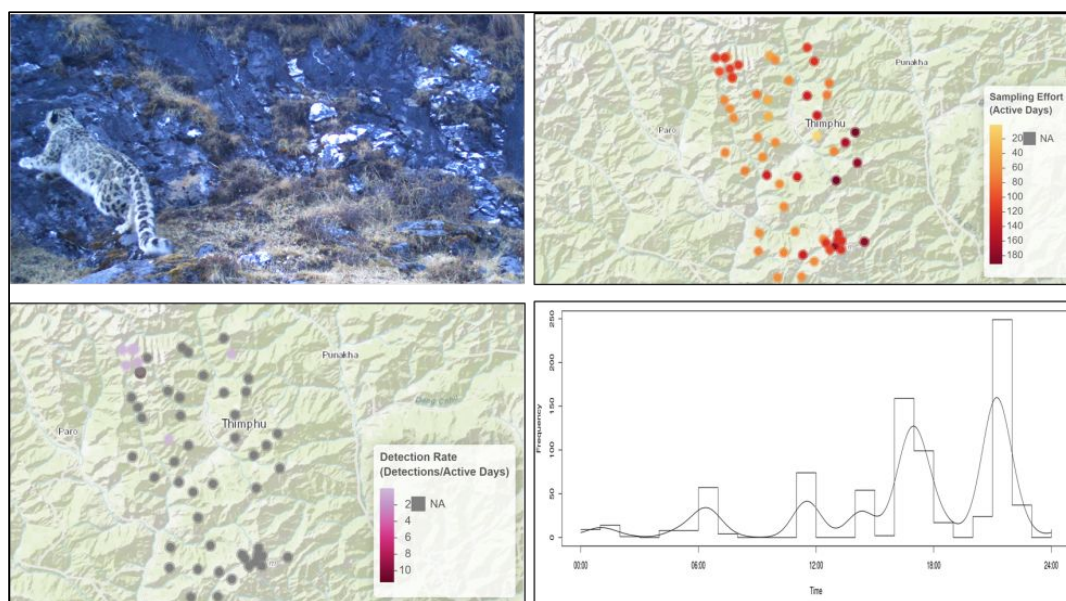


Figure 23: Activity patterns of snow leopard as captured from camera trap data

Asiatic Black Bear

The distribution of the Asiatic Black Bear (*Ursus thibetanus*) was observed to be widely distributed, predominantly displaying nocturnal behavior (figure 24).

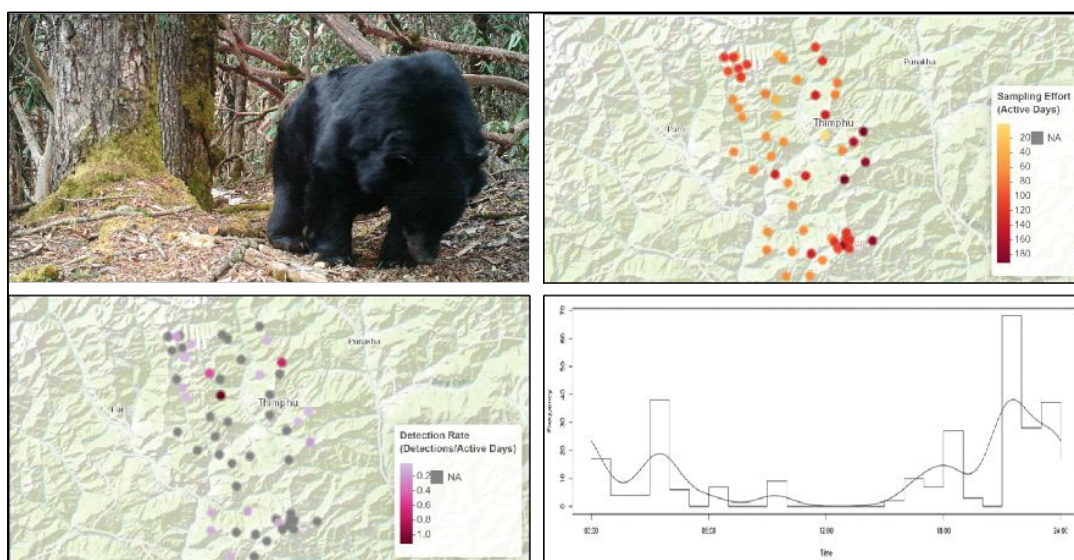


Figure 24: Activity pattern of Asiatic Black Bear

Wild Dog

Camera trap images of the wild dog (*Cuon alpinus*) from various locations have provided valuable insights into its behavior and ecology. The species exhibited predominantly diurnal activity with most movements recorded during daylight hours (figure 25). The daytime activity pattern is closely linked to the availability of prey including domestic animals (cattle).

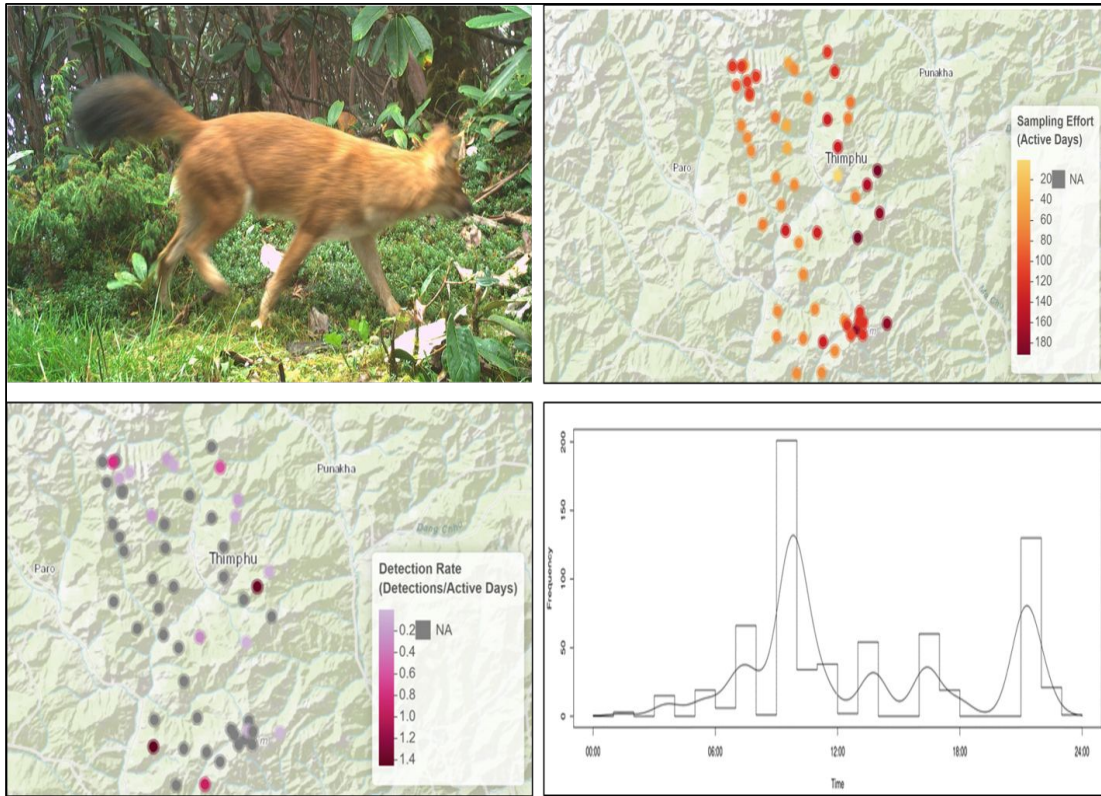


Figure 25: Activity pattern of wild dog as recorded from camera traps

Activity pattern of herbivores

Herbivores play a vital role in maintaining ecosystem balance. Understanding their activity patterns is essential for effective conservation. Camera trap data revealed that Himalayan Serow, Sambar and Barking Deer exhibited predominantly crepuscular behavior with occasional nocturnal activity. Wild Pigs, on the other hand displayed diurnal patterns (figure 26). These activity rhythms are shaped by the need to evade predators such as Tigers, Leopards, and Wild Dogs.

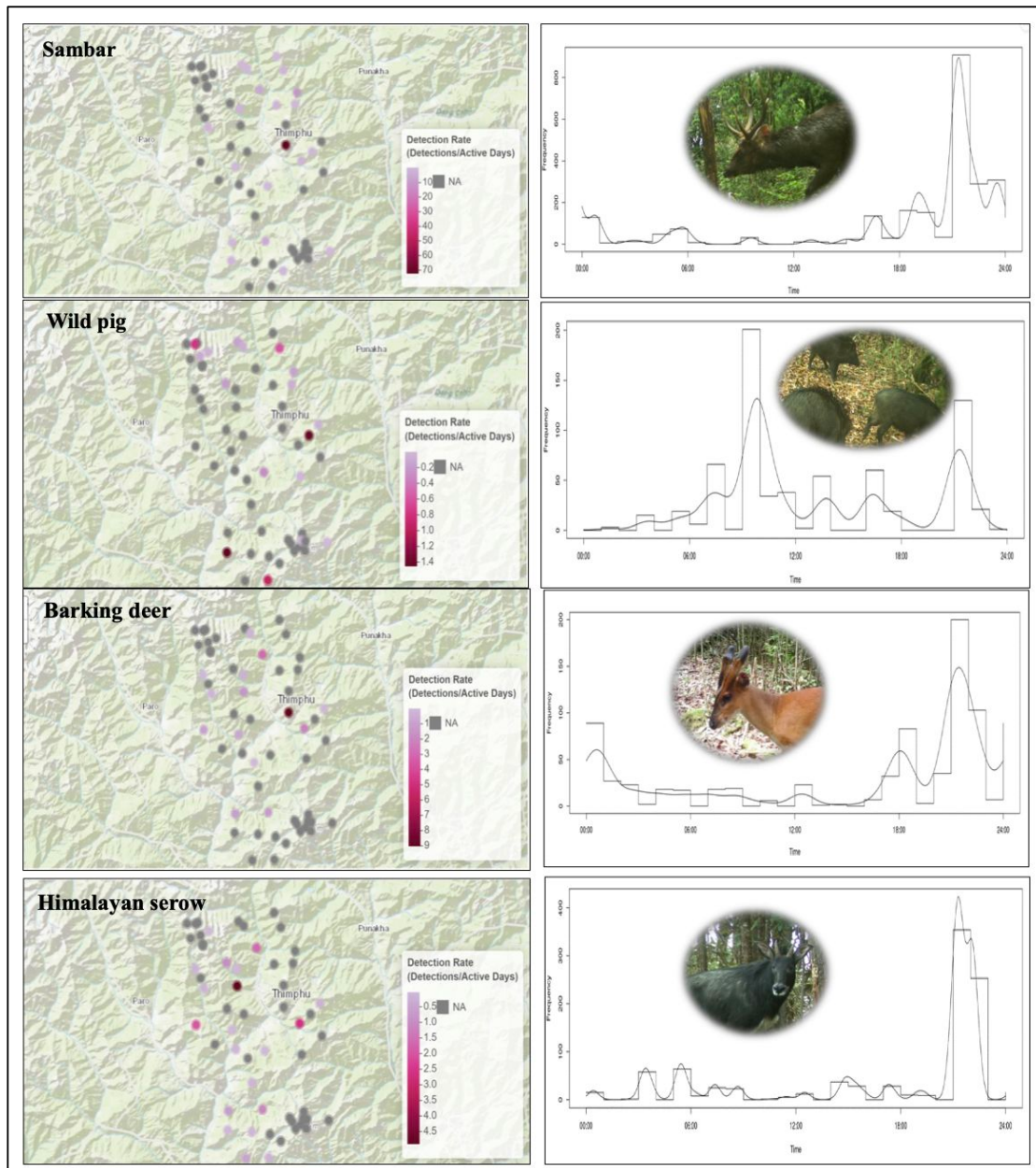


Figure 26: Activity patterns of herbivores as captured from camera trap data

2.3.4 Butterfly Diversity

As of March 2023, a total of 91 butterfly species representing five families have been recorded based on available secondary data (existing forest management regimes). The most dominant family is Nymphalidae comprising 42% (n=38), followed by Lycaenidae at 21% (n=19), Pieridae at 17% (n=16), Papilionidae at 12% (n=11), and Hesperidae at 8% (n=7) (figure 27). Commonly observed species in the lower parts of Thimphu include Blue Pansy, Chocolate Pansy, Common Peacock, Common Rose, and Painted Lady.

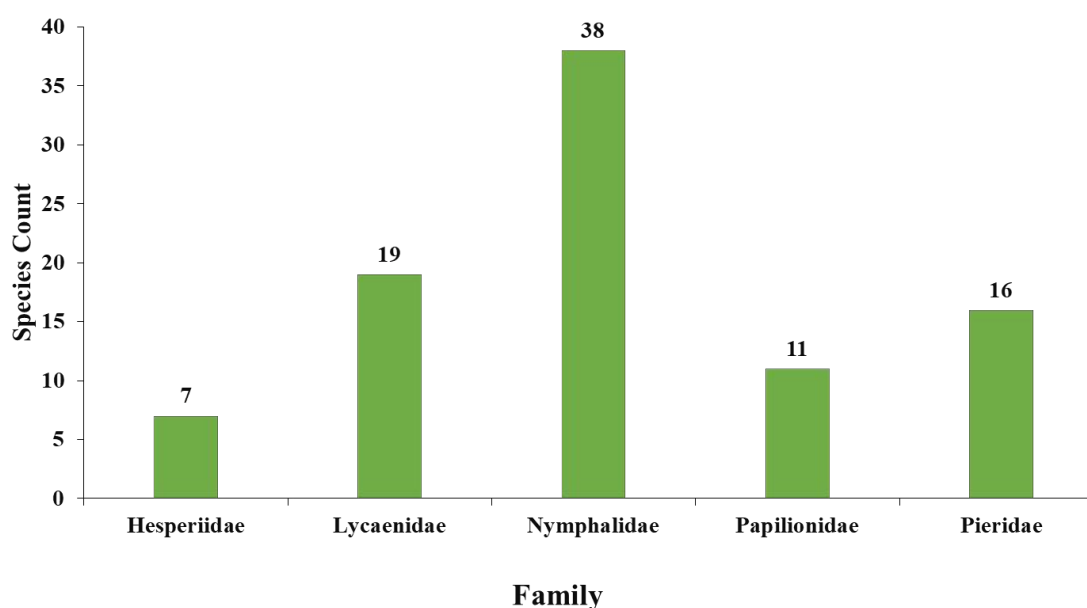


Figure 27: Butterfly species count by family

2.3.5 Herpetofauna Diversity

Being in dry temperate belt, DFO Thimphu is not diverse in terms of reptiles and amphibians. It recorded 6 species as per available official document (existing forest management regimes and reports) (table 5). However, the list may increase as we continue to monitor the Biodiversity Monitoring Grids (BMG).

Table 5: List of reptiles and amphibians under the division

Sl#	Common Name	Scientific name	Family
1	Chinese false cobra	<i>Pseudoxenodon macrops</i>	Colubridae
2	White spotted supple skink	<i>Riopa albopunctata</i>	Scincidae
3	Blyth's short Limed frog	<i>Scutiger sikkimenses</i>	Megophryidae
4	Himalayan toad	<i>Duttaphrynus himalayanus</i>	Bufonidae
5	Sikkim Paa	<i>Nanorana leibigii</i>	Dicroglossidae
6	Torrent Paa Frog	<i>Nanorana ercepeae</i>	Dicroglossidae

2.3.6 Fish Diversity

Two species of fish (table 6) have been recorded as of 2023 viz snow trout/Asla (*Schizothorax richardsonii*) and Brown trout (*Salmo trutta*). Snow trout which is a native species is categorized as vulnerable under IUCN Red list while the Brown trout is listed under Least Concern. Both the species face threats from illegal fishing and deteriorating water quality as a result of anthropogenic activities.

Table 6: Fish species under the division

Sl#	Common Name	Scientific Name	Family	IUCN Status
1	Asla/Snow Trout	<i>Schizothorax richardsonii</i>	Cyprinidae	Vulnerable
2	Brown Trout	<i>Salmo trutta</i>	Salmonidae	Least concern

2.4 Existing Management Regimes

Existing forest management regimes under Divisional Forest Office, Thimphu include both Area Based Management Regimes (ABMR) and Cross-Cutting Management Regimes (CCMR) where 21 Community Forest spread over five gewogs, 2 Local Forest Management Areas and 2 Forest Management Units are managed for sustainable allotment of resources. Similarly, existing Cross-Cutting Management Regimes include 2 Non-Wood Forest Produce Management Areas, 1 High Conservation Value Area and 10 Scientific Thinning Sites.

These management regimes are initiated to ensure sustainable supply of forest resources through direct or indirect involvement of local communities. However, existing management regimes face both anthropogenic and natural threats such as illegal timber harvesting, degradation of forest from numerous developmental activities, forest fire, forest pest and diseases.

The effective implementation of existing management regimes is often hindered by several interconnected challenges. Inadequate monitoring results in inconsistent oversight, leaving plans untracked and opportunities for improvement being overlooked. Discrepancies in implementation further exacerbate the issue, creating uneven progress and outcomes. Limited resources, particularly insufficient budget constrain the ability to conduct thorough monitoring and ensure seamless execution of the plans. Additionally, the lack of consistent adherence to strategies often lead to ineffective implementation undermining the intended objectives. Together, these challenges underscore the need for a more cohesive, well-resourced, and accountable approach to management through enhancement of technical capacities of frontline field conservationists and local communities alike.

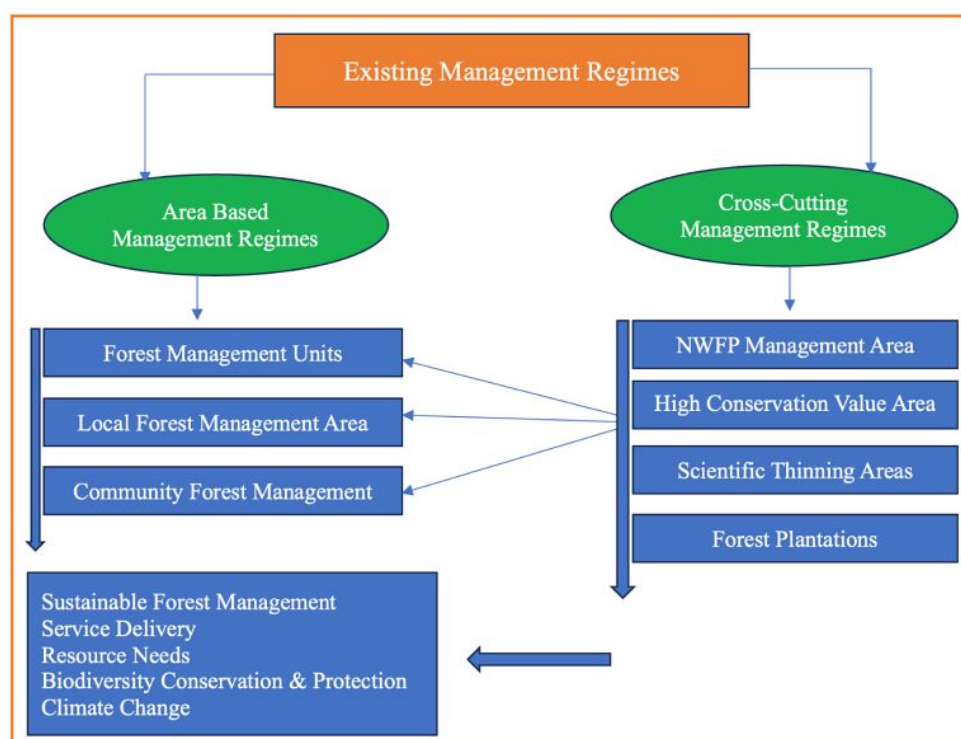
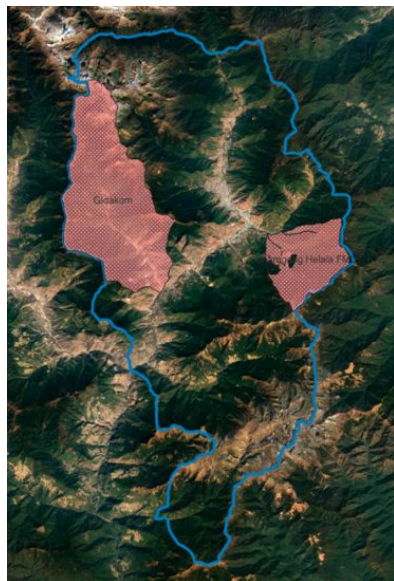


Figure 28: Skeletal of the existing management regimes under the division

2.4.1 Area-Based Management Regimes (ABMR)

2.4.1.1 Forest Management Units



Forest Management Units (FMUs) are established to sustainably address both commercial and rural timber needs. The Divisional Forest Office, Thimphu oversees two FMUs: Gidakom and Chamgang Helela. The Gidakom FMU, located in Mewang Gewog, is currently in its fourth management cycle, with an Annual Allowable Cut (AAC) of 7,400 m³. Its management plan spans from 1st April 2022 to 31st March 2032. Similarly, the Chamgang Helela FMU, situated in Dagala Gewog, is in its third management cycle, with an AAC of 1800 m³. The plan period runs from August 2017 to July 2027.

Figure 29: Map showing two FMUs under the division

Table 7: Table showing existing FMUs with their basic details

Name of FMU	Dzong-khag	Gewog	Year of Establishment	Total Area (Ha)	Production Area (Ha)	Annual Allowable Cut (m ³)			Plan Period	Plan Cycle
						Commercial	Rural	Total		
Gidakom	Thimphu	Mewang	1977	13101.25	6844.28	5000	2400	7400	April 2022-March 2032	4th
Chamgang Helela	Thimphu	Dagala	1993	4508.78	2101.69	0	1800	1800	Aug 2017-July 2027	3rd

2.4.1.2 Local Forest Management Area

Local Forest Management Areas are gewog-based management plans prepared to meet rural timber demand of local communities. It is prepared to ensure that no repeated timber demand is placed from the same site over and over again. Such plans in place ensure that all potential timber production areas are equally or sustainably managed.

Table 8: LFMA with their basic information

Name of LFMA	Dzong-khag	Gewog	Year of Establishment	Total Gewog Area (Ha)	Area covered by the plan (Ha)	Annual Allowable Cut (m ³)	Plan Period	Plan Cycle
Chang	Thimphu	Chang	2020	15687.66	7911.5	4674	July 2020-June 2030	1st
Geney	Thimphu	Geney	2019	6092.54	3805.5	1805	July 2019-June 2029	1st

2.4.1.3 Community Forest Management Areas

The Community Forestry (CF) program in Bhutan began as a transformative initiative following the declaration of Social Forestry Day in 1985 by His Majesty the Fourth Druk Gyalpo. Guided by His Majesty King Jigme Singye Wangchuck's visionary proclamation in 1979 that "the participation of the local community is the key to conservation and utilisation of forest resources," the program has evolved from a pilot initiative into a robust, full-fledged endeavor under the Department of Forest and Park Services. This commitment underscores Bhutan's holistic approach to sustainable forest management, empowering communities to take an active role in preserving and responsibly utilizing the nation's invaluable forest resources.

DFO Thimphu as one of the field divisions took its share of responsibilities and instituted 21 community forest spread over five gewogs refer table 9.

Table 9: Community Forest with their basic information

Name of CF	Estd Year	Dzong-khag	No of HHs	Gewog	Total Area (Ha)	Area under Forest Cover (Ha)	Annual Allowable Cut (AAC) in m3	Plan Period	Plan Cycle
Samden	2010	Thimphu	51	Chang	149.6	143.66	290.48	2021-2031	2nd
Tashi Pelkhil	2009	Thimphu	23	Chang	69	69	197.14	2019-2029	2nd
Trendrelgang	2010	Thimphu	21	Chang	56.91	51.69	125.5	2021-2031	2nd
Yatshap	2009	Thimphu	14	Chang	42	42	75	2019-2029	2nd
Kachupoen-zshu	2010	Thimphu	50	Dagala	144.4	137.6	197.58	2021-2031	2nd
Rinchending	2012	Thimphu	48	Dagala	134.69	134.69	157	2022-2032	2nd
Domchoe	2012	Thimphu	24	Geney	72	63.49	112.6	2023-2033	2nd
Tashi Wang-chey	2009	Thimphu	22	Geney	66	66	301.5	2019-2029	2nd
Tashi Yangyel	2009	Thimphu	41	Geney	125	125	243	2020-2030	2nd
Zanglungkha	2009	Thimphu	28	Geney	81	81	521	2019-2029	2nd
Goenday Kuenzom	2010	Thimphu	28	Kawang	84	84	221.54	2021-2031	2nd
Chanda	2010	Thimphu	36	Kawang	107.4	91.28	193.77	2021-2031	2nd
Dazhi Zoshel	2011	Thimphu	135	Kawang	345	296.39	1184.61	2022-2032	2nd
Kuzhukchen	2010	Thimphu	27	Kawang	81	81	197.44	2021-2031	2nd
Chokhor	2009	Thimphu	29	Kawang	87	87	323.59	2019-2029	2nd
Chamina	2012	Thimphu	21	Kawang	57	57	52.97	2023-2033	2nd
Nobrig	2012	Thimphu	22	Kawang	75.84	68.14	125.173	2024-2034	2nd
Darlokh	2009	Thimphu	29	Mewang	87.05	63.48	82.37	2019-2029	2nd
Khariphu	2009	Thimphu	53	Mewang	159	115	236.9	2019-2029	2nd
Khasakha	2010	Thimphu	95	Mewang	264.48	226.58	250	2021-2031	2nd
Tshangphu	2012	Thimphu	46	Mewang	150	144	295.06	2023-2033	2nd
					2438.37				

2.4.2 Cross-Cutting Management Regimes (CCMR)

2.4.2.1 Non-Wood Forest Produce Management Area

Non-Wood Forest Products (NWFPs) play a pivotal role in enhancing community participation in sustainable forest management and improving local livelihoods. By offering tangible economic benefits through the collection, processing, and sale of resources like medicinal plants and mushrooms, NWFPs create direct incentives for communities to actively engage in forest conservation. This participation fosters a sense of stewardship among local population, encouraging sustainable practices that preserve biodiversity and forest health. Additionally, NWFPs contribute significantly to income generation, especially in rural areas, by supporting small-scale enterprises and promoting value-added products. These activities not only diversify livelihood options but make local communities take ownership whereby aligning conservation efforts with economic development. By integrating NWFP-based initiatives into forest management policies, communities are empowered as key stakeholders, ensuring forests are sustainably managed for both ecological integrity and long-term socio-economic benefits. Understanding both short-term and long-term benefits from such programs, local communities have come forward to manage NWFPs at two different locations viz Geney and Dagala.

2.4.2.2 High Conservation Value Area

A key cross-cutting management initiative within this division is the establishment of High Conservation Value Area (HCVA), aimed at safeguarding critical environmental, social, and cultural values within forest production landscapes. In this endeavor, the Divisional Forest Office, Thimphu, has designated an HCVA under Dagala Gewog, focusing on vital ecosystem services. The ultimate vision is to develop a Payment for Environmental Services (PES) scheme, fostering a sustainable and mutually enriching partnership between the upstream communities of Dagala Gewog and the urban population of Thimphu Thromde. By bridging rural stewardship with urban reliance, this initiative aspires to harmonize conservation efforts with socio-economic growth, creating enduring bonds rooted in shared environmental responsibility.

2.4.2.3 Scientific Thinning Areas

Scientific thinning is a cornerstone of sustainable forest management, designed to enhance the productive potential of forest stands while generating economic returns through judicious removal of excessive stems. Left unmanaged, these surplus stems can hinder stand productivity, making thinning an essential intervention. By channeling growth potential towards high-quality trees, it promotes healthier, more robust forests ecosystem. Furthermore, scientific thinning addresses commercial timber demands for developmental activities, fostering economic growth. Simultaneously, it bolsters stand stability, mitigates fire hazards, and elevates the quality and size of future timber yield. Beyond these tangible benefits, it contributes to richer ecosystem services, ensuring forests thrive as resilient and sustainable landscapes. Following are scientific thinning sites identified and approved for implementation till 2026.

Table 10: Approved Scientific Thinning Areas for 2023 to 2026

Sl. No	Thinning Area	Thinning Production Area (Ha)	Thinning Volume (standing volume in m3)	Thinning Volume (Standing Volume in cft)	Approximate Log Volume (cft)
1	Ngabiphu (RTC)	605.49	3239.37	114382.21	68629.32
2	Changgaphu	1072.24	5736.49	202555.457	121532.77
3	Tashiganggoenpa	1003.23	5367.28	189518.66	113711.2
4	Khariphu	639.3	3420.26	120769.38	72461.63
5	Namseling	391.99	2097.15	74050.24	44430.15
6	Tshochekha	382.82	2048.09	72317.95	43390.77
7	Geney Paga	266.46	1425.56	50336.56	30201.94
8	Geney Zamtog	284.08	1519.83	53665.13	32199.08
9	Geney, Genekha	158.91	850.17	30019.45	18011.67
10	Thimthrom	5017.2	26842.02	947791.73	568675.04
		9821.72	52546.22	1855406.767	11,13,243.57

2.4.2.4 Forest Plantations

Forest plantations are one of the cross-cutting management regimes falling across different management regimes including Local Forest Management Areas, Forest Management Units and Community Forest. Although, plantations have been taken up at different scale and locations, the figure for this plan is limited to the ones which have certain details on area (shapefile), funding source, species planted and year of creation. The ones without these details have not been reflected in this plan. The figure under this regime is likely to increase as DFO Thimphu has the largest degraded and barren area among the field divisions as per Degraded and Barren Area (DBA) Mapping and Validation exercise conducted in March 2025. It stands at 1395.90 hectare (source ThFD/FRPMS/17(a)/2024-2025/656 dated 20th March 2025). Figure 30 depicts some of the major plantation sites under the division.

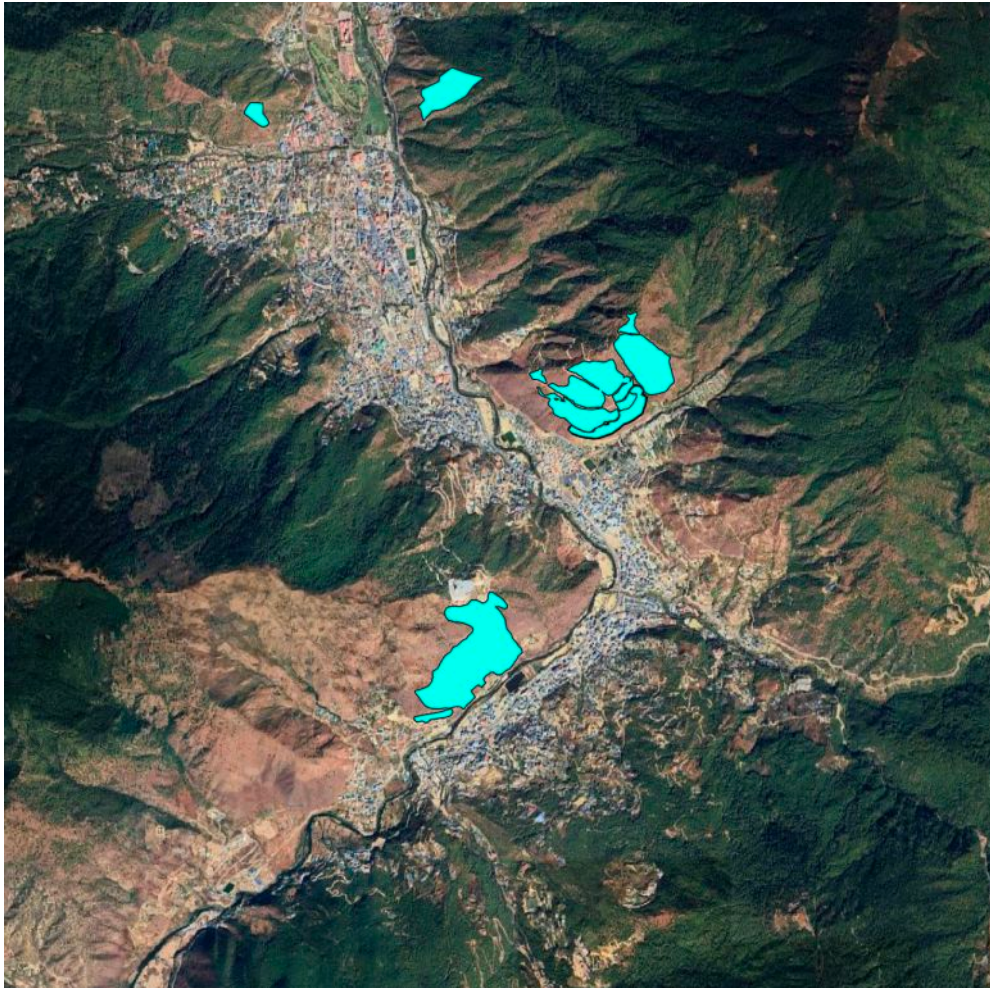


Figure 30: Forest Plantation Sites

To summarize, the following are the areas currently managed under Cross-Cutting Management Regimes covering an area of 20760.91 hectares which roughly translates to 24% of the total geographic area of the division, details of which is given in table 11.

Table 11: List of cross-cutting management regimes with their basic information

Sl#	Name of Cross-cutting Management Regime	Name of Area-Based Management Regime (ABMR)	Dzongkhag	Gewog	Year of operationalization of CCMR	Total Area under Mgmt Intervention (Ha)	Area covered by ABMR (Ha)	Key Management Interventions	Plan Period of ABMR
1	Geney Community Mushroom Management Group	Local Forest Management Area, Geney	Thimphu	Geney	2008	857.5	3805.5	Annual collection and marketing of Matsutake Mushroom and conservation of mushroom growing area	July 2019 - June 2029
2	Jhomdaga Ngomen Tshogpa	Chamgang Helela FMU	Thimphu	Dagala	2022	7730.12	175.94	Annual collection and marketing of Juniper species, Nardostachys jatamensis, Picrhorhiza etc	August 2017 - July 2027
3	High Conservation Value Area	Chamgang Helela FMU	Thimphu	Dagala	2023	2220.94	1018.05	Conservation or protection of water sources including recharge zone and initiation of PES in future	August 2017 - July 2027
4	Scientific Thinning	Local Forest Management Area, Geney and Chang	Thimphu	Chang, Geney, Mewang	2023	9821.72	9821.72	Thinning of forest stand under approved thinning action plan (2023-2026)	July 2019 - June 2030
5	Plantations	Chang LFMA	Thimphu	Chang		130.63	130.63	Restoration of degraded landscape	July 2019 - June 2030
						20760.91			

2.5 Forest Resources and Utilization

2.5.1 Forest Resources

Since the Rapid Biodiversity Assessment (RBA) conducted in 2023 at the division level was not comprehensive with low sampling intensity, data from the National Forestry Inventory, Volume I, State of Forest Report, 2023 is used to report on forest type, forest cover, stem density, basal area, and growing stock for this plan. Similarly, the National Forestry Inventory, Volume II, State of Forest Carbon Report, 2023, is used to calculate the carbon stock and carbon sequestration potential at the division level. Likewise, using the Forest Type Map of Bhutan 2022 (shapefile), DFO Thimphu has eight forest types, including Dry Alpine Scrub and Juniper Rhododendron Scrub (refer figure 31).

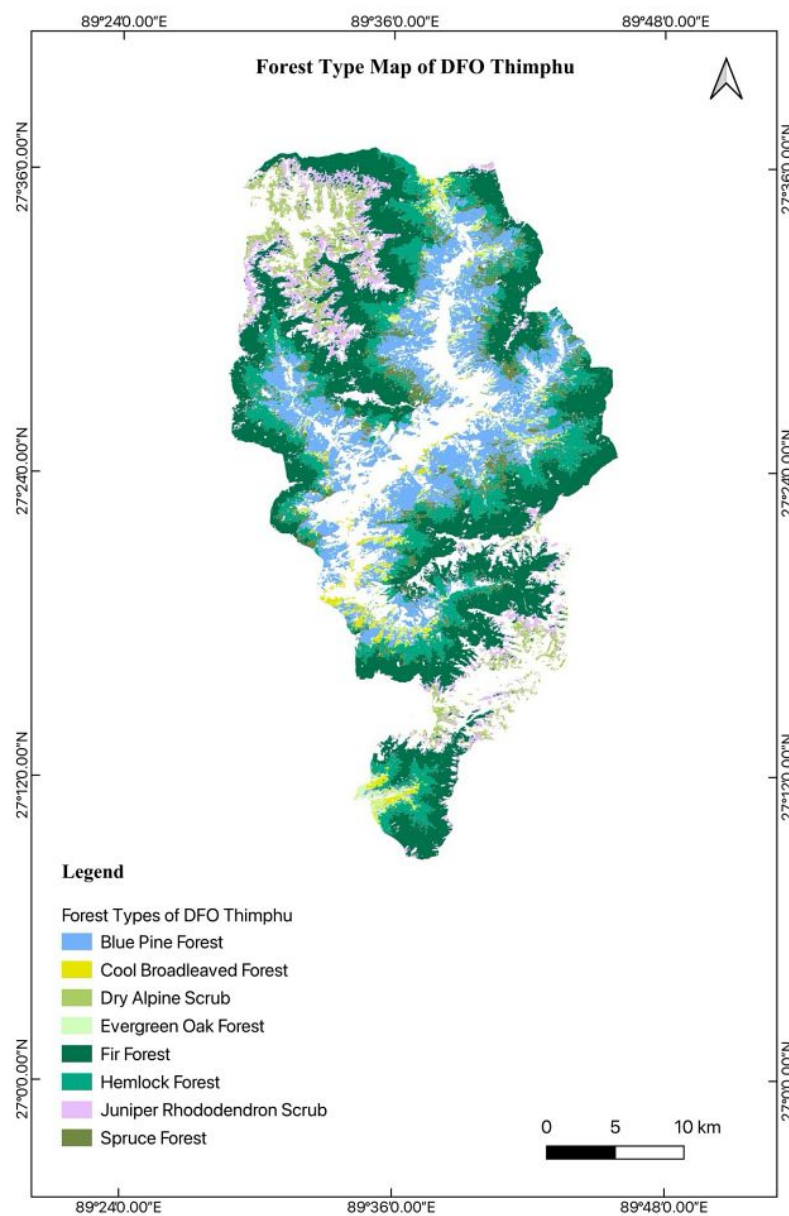


Figure 31: Forest types within the division

Within this forest landscape, the division is responsible for allotment of at least 16 forest products including timber. It caters to both commercial and rural demand. As per the FIRMS data maintained with the division for the period July 2023 to June 2024 where 386.27 acres of state reserved forest land has been granted with Forestry Clearance for various developmental activities. Similarly, 167.11 acres of forest land has been damaged by forest fire and another 344.87 acres have been affected by forest pest and disease mainly attributed by bark beetle and pine die-back. Among the 16 forest products, 9 are collected substantially as indicated in table 12 where commercial timber stands out as the most allotted resource recorded at 6394.43 m³ in a year followed by rural timber, which measured 4690.12 m³. Mushroom billets allotment is recorded at 9200 pieces. Additionally, Rhododendron leaves locally called as Balu Sulu amounts to 4112 kilograms.

In a comparative sense, commercial timber exceeds rural timber by approximately 1704.31 m³, indicating its larger allotment. Among the other resources collected in truckload basis, Topsoil recorded at 608 T/L, surpassing stone and boulders (41 T/L) and sand (16 T/L). Similarly, *Nardostachys jatamensis* collection in the same period is recorded at 2158 kilograms.

Table 12: Forest resources consumption between July 2023 – June 2024

Sl. No	Resources Allotted	Form	Quantity	Unit	Remarks
1	Volume of Commercial Timber Allotted	Sawn	726.17	m ³	
		Logs	5179.10	m ³	
		Poles	198.24	m ³	
		Standing Form	290.92	m ³	
2	Volume of Rural Timber Allotted	Standing Form	4517.46	m ³	New House Construction: 4322.06 m ³ for 51 households and Renovation: 195.4 m ³ for 9 households.
		Poles	172.66	m ³	73 households
3	Firewood		3207.50	m ³	Commercial Purpose: 3019 m ³ Rural Purpose: 188.5m ³
4	Mushroom Billet		9200	pcs	Domestic Market
5	Juniper leaves		4	T/L	Domestic use
6	<i>Nardostachys grandiflora</i>		2158	kg	
7	Leaf mould		790	T/L	Domestic use
8	Bamboo Allotted (<i>Yushiania maling</i>)		20	Bundles	Domestic Market
9	<i>Picorrhiza</i> spp		77	kgs	Domestic Market
10	Rhododendron leaves		4112	Kgs	Domestic Market
11	Blue Pine Leaves		8	T/L	Domestic Market
12	Boulders/Stone		328	m ³	Domestic Market

13	Dolep (Flat stone)		40	m ³	Domestic Market
14	Top Soil		608	T/L	Domestic Market
15	Sand		16	T/L	Domestic Market
16	Granular Sub Base Materials		15	T/L	Domestic Market
17	Total SRF Land Allotted for Developmental Activities		386.27	acres	Includes SRF land allotted for roads, transmission lines, land substitutes, land exchanges, land leases, and project development
18	SRF Land Destroyed by Forest Fires		167.11	acres	SRF land destroyed by forest fires
19	SRF Area Affected by Pests and Diseases		344.87	acres	SRF land destroyed by pests and diseases

Wood-based industries play a crucial role in adding values to the forest produce particularly timber to eventually meet both rural and commercial timber demand. To facilitate this, Thimphu Forest Division through the authorized agency supply timber to wood-based industries. The details of WBIs under this division include 62 furniture units, one briquette manufacturing unit, 18 stationary sawmills, 8 incense manufacturing units, 14 logging firms, 2 mobile sawmills, and 2 Wood-based Handicraft Units as indicated in figure 32.

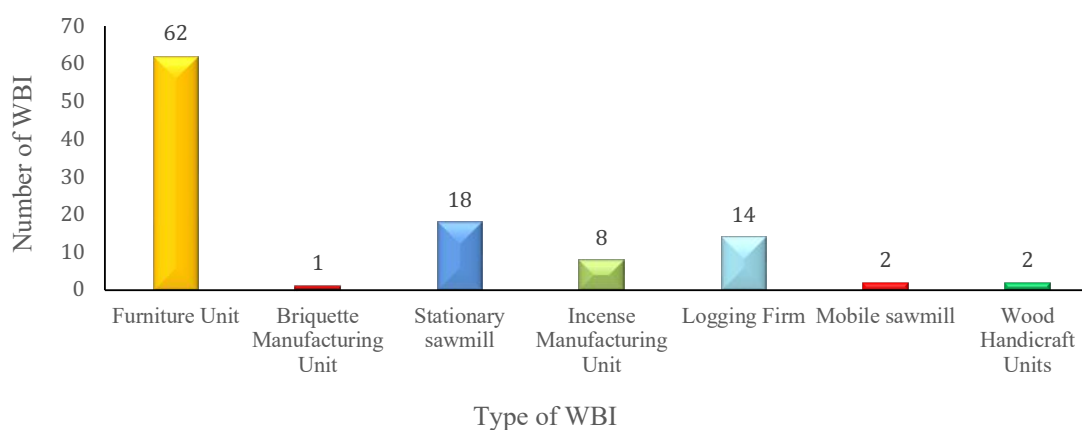


Figure 32: Wood-Based Industries

2.5.1.1 Forest Cover

As per NFI Volume I (State of Forest Report 2023), the forest cover of Thimphu Dzongkhag is estimated at 45.18% of its total geographical area of 179,577.14 hectares. However, since the Divisional Forest Office (DFO) Thimphu covers only part of the Dzongkhag, forest cover for the division has been calculated based on its geographical area of 87,641.20 hectares. In this calculation, two of the eight forest types viz Dry Alpine

Scrub and Juniper Rhododendron Scrub are excluded as they do not meet the technical definition of “forest cover” under FNCA 2023. As the northern part of Thimphu Dzongkhag is largely dominated by these two forest types, the forest cover at Dzongkhag level appears relatively low at 45.18%. In contrast, the division-level forest cover appears higher at 65.78%, as areas under these two forest types are not included in the calculation.

Table 13: Forest cover of the division

Division Area (Ha)	Forest Area (Ha)	Forest Cover (%)
87641.20	57647.93	65.78
Forest Type	Area (Ha)	Percent (%)
Blue Pine Forest	13880.61	24.07824531
Cool Broadleaved Forest	1796.04	3.115532509
Evergreen Oak Forest	2039.92	3.538583259
Fir Forest	25876.25	44.88669411
Hemlock Forest	10563.1	18.32346799
Spruce Forest	3492.01	6.057476825
Total	57647.93	100

2.5.1.2 Tree Count

At the national level, the highest tree density was recorded at 490 stems/hectare and the lowest at 263 stems/hectare. Thimphu Dzongkhag recorded 415 stems, which is slightly higher than 411 stems per hectare recorded at the division level.

Table 14: Tree count or stem density of the division

Average Tree Count per Hectare = 411			
Forest Type	Area (Ha)	Tree count (No. per hectare)	Total Tree count
Blue Pine Forest	13880.61	426	5913139.86
Cool Broadleaved Forest	1796.04	417	748948.68
Evergreen Oak Forest	2039.92	417	850646.64
Fir Forest	25876.25	402	10402252.5
Hemlock Forest	10563.1	406	4288618.6
Spruce Forest	3492.01	401	1400296.01
Total	57647.93		23603902.29

2.5.1.3 Basal Area

Basal Area of the division is also calculated based on NFI report where it found to be 38.67m²/hectare which is slightly higher than what has been estimated at the national level recorded at 36.65m² hectare. By forest type, the highest BA is recorded for Hemlock (46.51) followed by Fir at 44.47. In contrast, the lowest BA is recorded for Blue Pine Forest.

Table 15: Basal Area of the division by forest type

Total Basal Area = 2246925.61m ²			
Average Basal Area = 38.67m ² /hectare			
Forest Type	Area (Ha)	Basal Area per hectare in m ²	Total Basal Area (m ²)
Blue Pine Forest	13880.61	23.14	321197.32
Cool Broadleaved Forest	1796.04	42.89	77032.16
Evergreen Oak Forest	2039.92	38.07	77659.75
Fir Forest	25876.25	44.47	1150716.84
Hemlock Forest	10563.1	46.51	491289.78
Spruce Forest	3492.01	36.95	129029.77
Total	57647.93		2246925.61

2.5.1.4 Growing Stock

As per NFI Report 2023 (Volume I), the growing stock at the national level for Thimphu Dzongkhag is calculated at 353.33m³ per hectare which is bit more than national average of 283.65 cubic meter per hectare. Calculating for the forest cover of 57647.93 hectare, the division has a growing stock of 259.28m³/hectare which looks reliable as the northern parts of the division with more of Dry Alpine Scrub and Juniper Rhododendron Scrub fall under Jigme Dorji National Park (JDNP). The total growing stock of the division is calculated at 20620124.40m³ or 20.62 million cubic meter.

Table 16: Growing Stock or volume by forest type

Total Growing Stock = 20620124.40m ³			
Average Growing Stock =359.28m ³ /hectare			
Forest Type	Area (Ha)	Volume in m ³ per hectare	Growing Stock by Forest Type in m ³
Blue Pine Forest	13880.61	209.17	2903407.194
Cool Broadleaved Forest	1796.04	379.15	680968.566
Evergreen Oak Forest	2039.92	341.01	695633.1192
Fir Forest	25876.25	398.82	10319966.03
Hemlock Forest	10563.1	442.7	4676284.37
Spruce Forest	3492.01	384.84	1343865.128
Total	57647.93		20620124.4

2.5.1.5 Forest Biomass

Forest biomass encompasses all parts of the plant such as the branches, leaves, bark, trunk, needles, roots, etc., which can be converted to energy (FMID, 2023). Biomass of DFO Thimphu is estimated using the NFI report volume II, 2023 (page no. 89-95). For this report, biomass for five carbon pools: (i) Above Ground Biomass (ABG), (ii) Below Ground Biomass (BGB); (iii) Coarse Woody Debris (CWD); (iv) Litter and (v) Soil Organic Carbon are considered.

Table 17: Forest Biomass of the division

Total Biomass of five pool = 11386265.96 tonnes								
Average biomass per hectare = 197.51 tonnes/hectare								
Forest Type	Area (Ha)	ABG	BGB	CWD	Litter	SOC	Biomass of five pool	Total Biomass
Blue Pine Forest	13880.61	30.95	16.99	6.64	29.23	47.31	131.12	1820025.58
Cool Broadleaved Forest	1796.04	65.47	33.93	8.5	16.9	83.86	208.66	374761.71
Evergreen Oak Forest	2039.92	62.84	32.49	2.92	12.09	82.62	192.96	393622.96
Fir Forest	25876.25	61.08	31.86	11.4	21.73	95.4	221.43	5729778.04
Hemlock Forest	10563.1	65.19	33.77	17.1	17.38	92.7	226.17	2389056.33
Spruce Forest	3492.01	61.44	31.52	6.31	4.58	90.6	194.45	679021.34
Total	57647.93	347	180.6	52.9	101.9	492.5		11386265.96

2.5.1.6 Biomass increment

Biomass increment of the forest under the division is also calculated based on rate of increment from NFI Report (Volume II, page 97). It is observed that a total biomass increment of 36386.39 tonnes is added annually where the highest biomass increment is added in Fir Forest followed by Blue Pine Forest. In contrast, the lowest biomass increment is found in Evergreen Oak Forest with as low as 61.20 tonnes per year.

Table 18: Biomass increment

Forest Type	Area (Ha)	Biomass Increment	Total Biomass Increment
Blue Pine Forest	13880.61	0.36	4997.02
Cool Broadleaved Forest	1796.04	1.6	2873.66
Evergreen Oak Forest	2039.92	0.03	61.20
Fir Forest	25876.25	0.95	24582.44
Hemlock Forest	10563.1	0.32	3380.19
Spruce Forest	3492.01	0.14	488.88
Total	57647.93		36383.39

2.5.1.7 Carbon Stock

At the national level, carbon stock across different forest types varied from as low as 95.47 tonnes per hectare in Chirpine Forest to 263.21 tonnes per hectare in Cool Broadleaved Forest.

The total carbon stock for the Thimphu DFO is estimated taking the five carbon density of the five carbon pools in the forest types found within the DFO. Accordingly, the total carbon stock is estimated to be 13.10 million tonnes. Looking at the carbon stock by forest type, Fir Forest has the highest with 6.62 million tonnes followed by Hemlock Forest

with 2.78 million tonnes. In contrast, Cool Broadleaved Forest has the lowest carbon stock with 0.45 million tonnes.

Table 19: Carbon stock by forest type

Forest Type	Forest Area(Ha)	AGB	BGB	CWD	Litter	SOC	Total
Evergreen Oak Forests	2039.92	0.24	0.06	0.00	0.01	0.17	0.49
Cool Broadleaved Forest	1796.04	0.22	0.06	0.01	0.01	0.15	0.45
Blue Pine Forest	13880.61	0.81	0.22	0.04	0.19	0.66	1.92
Spruce Forest	3492.01	0.40	0.10	0.01	0.01	0.32	0.84
Hemlock Forest	10563.1	1.29	0.34	0.09	0.09	0.98	2.78
Fir Forest	25876.25	2.97	0.77	0.14	0.26	2.47	6.62
Total		5.94	1.56	0.29	0.57	4.74	13.10

2.5.1.8 Carbon Increment

Similar to biomass increment calculation, carbon increment of the division is also based on rate of carbon increment determined at the national level. DFO Thimphu sees carbon increment of 17165.43 tonnes per year with major increment seen in Fir Forest followed by Blue Pine Forest. In contrast, the lowest carbon increment is put up in Evergreen Oak Forest with as low as 20.40 tonnes in a year.

Table 20: Carbon Increment

Forest Type	Area (Ha)	Carbon Increment	Total Carbon Increment
Blue Pine Forest	13880.61	0.17	2359.70
Cool Broadleaved Forest	1796.04	0.75	1347.03
Evergreen Oak Forest	2039.92	0.01	20.40
Fir Forest	25876.25	0.45	11644.31
Hemlock Forest	10563.1	0.15	1584.47
Spruce Forest	3492.01	0.06	209.52
Total	57647.93		17165.43

2.5.1.9 Carbon Sequestration

Using the rate of sequestration determined in the NFI Report 2023 (Volume II), DFO Thimphu with a forest area of 57647.93 hectare has carbon sequestration potential of 240968.35 tonnes/year. At this rate and within the plan period of 10 years, the forest under the division is likely to sequester 24,09,683.50 tonnes of carbondioxide. Similarly, sequestration by non-forest area which also includes Dry Alpine Scrub and Juniper Rhododendron Scrub will remove 49788.83 tonnes of carbondioxide from the atmosphere. To summarize, the division with its geographical area of 87641.20 hectare is likely to sequester 290757.18 tonnes of carbondioxide annually.

Table 21: Carbon sequestration potential by the forest type

Land Class	Area (Ha)	CO2Sequestration Rate (tonnes/Ha/year)	CO2 Sequestration (tonnes/year)
Forest	57647.93	4.18	240968.35
Non-Forest	29993.27	1.66	49788.83
Total	87641.20		290757.18

2.5.2 Function Mapping

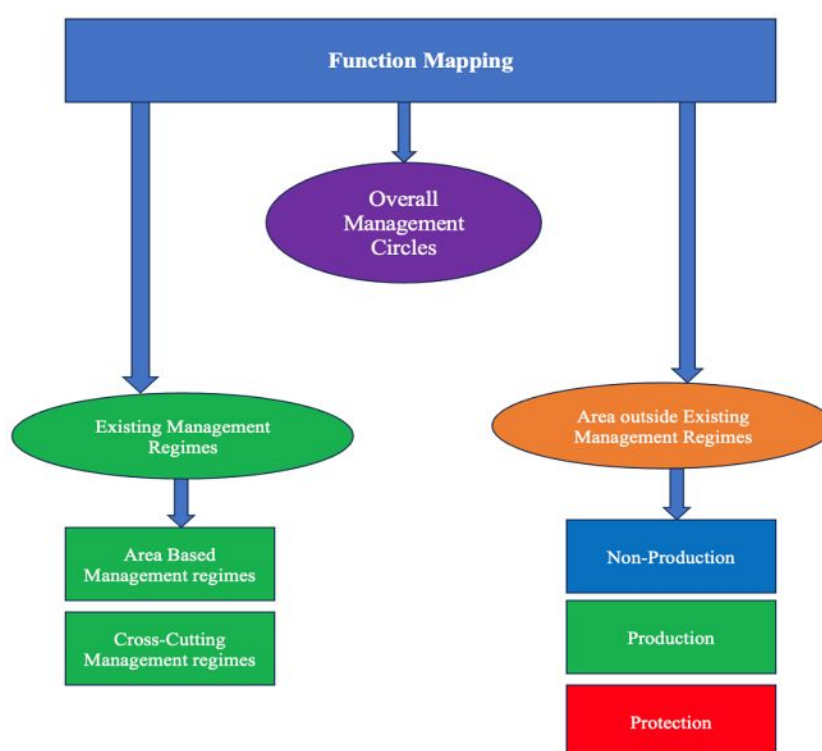


Figure 33: Skeletal of forest function mapping

Forest function mapping is one important aspect of sustainable forest management. It tries to designate the area into different functions to assign relevant management interventions. The result of function mapping which are inserted in the form of map in the management plan will provide instant information to take science-based decisions by the forest managers.

In doing function mapping for DFO Thimphu, the first and foremost step was identifying all the areas which need protection based on FNCA 2023. All those areas were mapped QGIS version 3.34. For instance, important cultural sites were buffered taking 500m radius. Similarly, all water bodies including local water sources were buffered using 30m radius. All slopes with more than 45° with more than 1 hectare area were also included to combinedly map the Protection Management Circle of the division which measured 5796.45 hectare.

It was then followed by mapping all the non-production areas using the LULC 2016 data where land use categories such as: cultivated agriculture land including latest cadastral data; thomde area; water bodies; shrub land; meadows; built up area were mapped to

form the Non-Production Management Circle of the division which measured 26487.86 hectare.

Once these two layers were mapped and merged together, it was straight forward to find the Production Management Circle of the division by calculating the difference between division area and area under these two layers. So, the production management circle of this division was calculated as 55356.89 hectare. This figure however includes all the existing management regimes (both area-based and cross-cutting management regimes) spread across five gewogs.

The main purpose of carrying out function mapping for the entire division area despite it being managed under several management regimes is to provide a clear picture of the division in few seconds. Secondly, it is useful to calculate area under each function outside the exiting management regimes. So, the planner of this division would suggest any reader to refer to figure 34 (Management Circles) to understand DFO Thimphu at a glance.

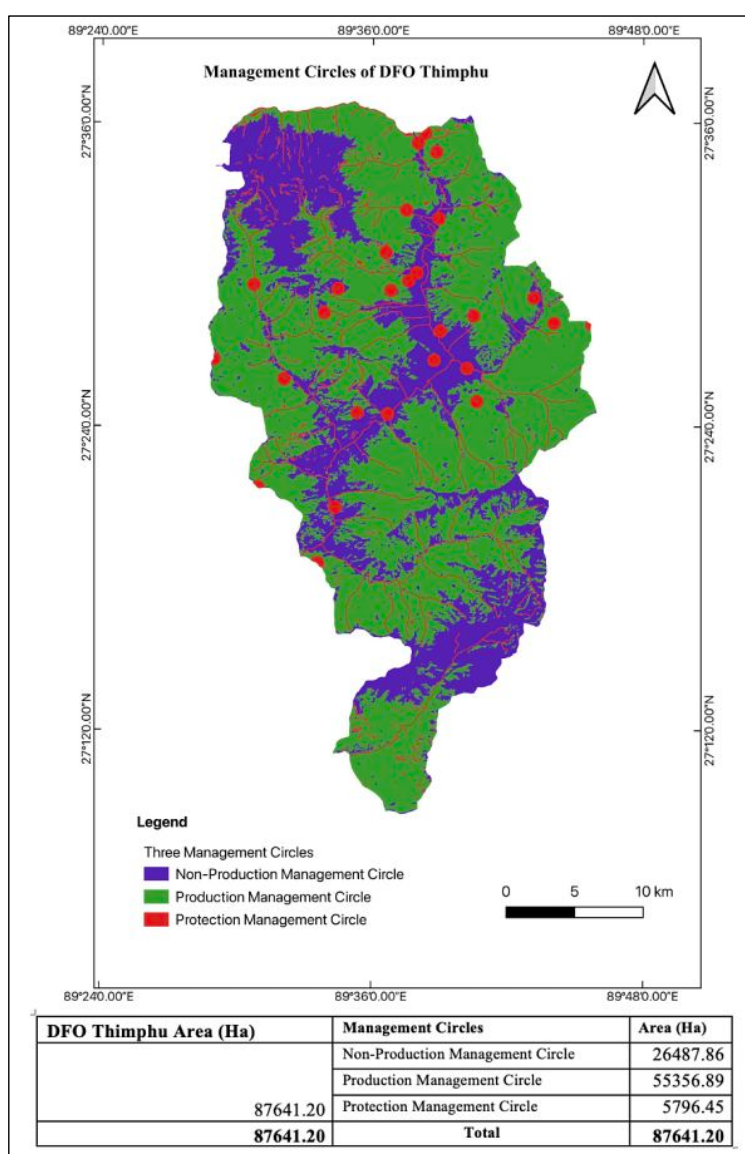


Figure 34: Management Circles of DFO Thimphu

Having given the overall picture of the division, subsequently, it is important to understand the existing management regimes that are spread across the divisional jurisdiction. For this plan, 21 community forests, two forest management units, and two local forest management areas are included under the Area-Based Management Regime covering an area of 29788.03 hectares as tabulated.

Table 22: Table showing Area-Based Management Regimes

SL#	Type of Area-Based Management Regime (ABMR)	Area (Ha)
1	Forest Management Unit (FMU)	17610.03
2	Local Forest Management Area (LFMA)	20863.00
3	Community Forest (CF)	2438.37
Total		40911.4

Similarly, Cross-Cutting Management Regimes such as two NWFP Management Areas viz Geney Community Mushroom Management Group, Jhomdaga Ngomen Tshogpa), one High Conservation Value Area (HCVA), ten Scientific Thinning areas and plantation sites are mapped covering an area of 20760.91 hectares. Refer to table 11.

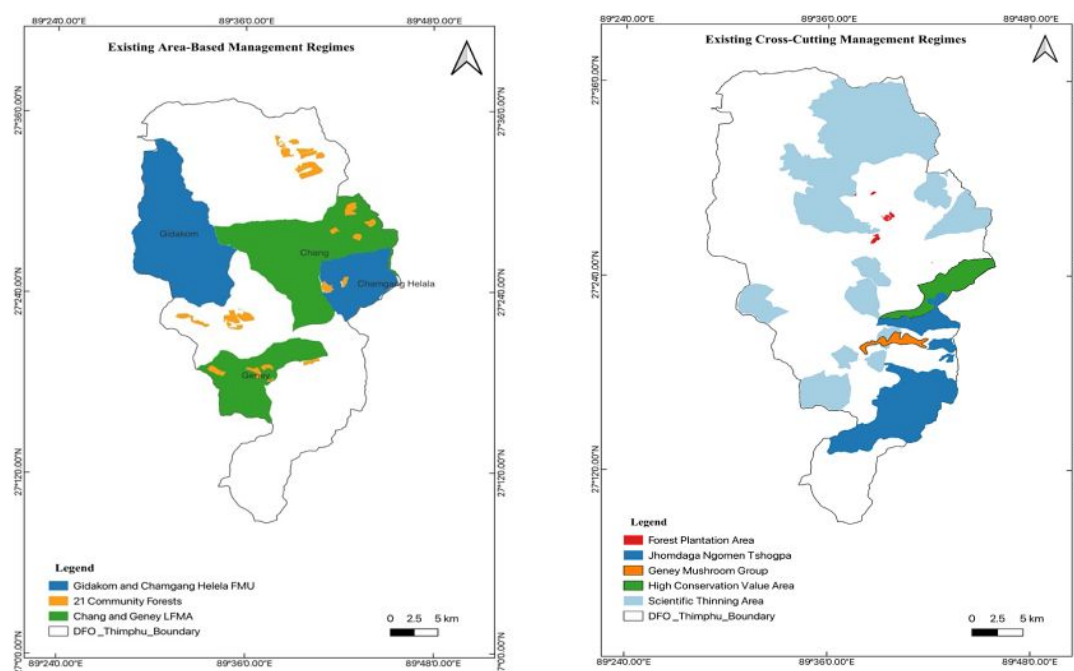


Figure 35: Map showing Area Based Management Regime (ABMR) and Cross-Cutting Management

This section is yet another important part of function mapping to understand the area outside the existing management regimes better. It will instantly and clearly indicate where are the potential timber productions areas, the protections areas and non-production areas to eventually bring under one form of management regime. So having done with function mapping for areas outside the existing management regimes, it is understood that the division still has around 15134.67 hectares of production area which are of course quite far from existing settlement. Refer to figure 36 (MCs outside EMRs).

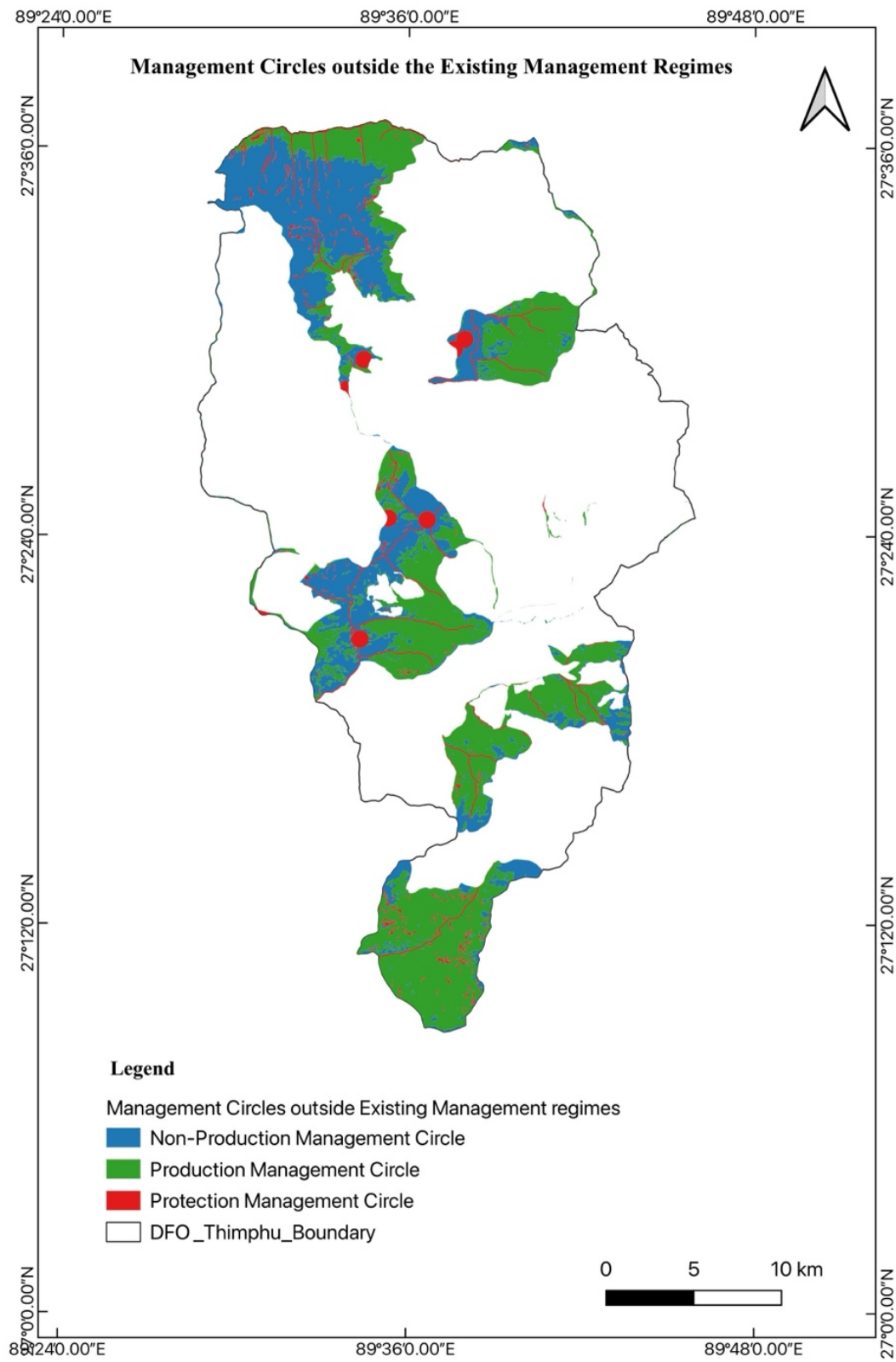


Figure 36: Management Circles outside the Existing Management Regime

Table 23: Management Circles outside the existing management regime and area

Area outside Existing Management Regime (EMR) in Ha	Management Circles outside EMRs (Ha)	Area (Ha)
27336.04	Production Management Circle	15134.67
	Protection Management Circle	1822.76
	Non-Production Management Circle	10378.61
27336.04	Total	27336.04

2.5.2.1 Production Management Circle

The existence of production area outside the existing management regimes underscores the potential for sustainable resource management to meet the demands for economic development without compromising the health and functions of forest ecosystem. The production area outside the existing management regimes for this division is determined at 15134.67 hectares comprising of six forest types/working circles. The Annual Allowable Cut (AAC) for areas outside the existing management regime is calculated using the formula:

$$\text{AAC(m}^3\text{)} = \text{Net Operable Area} \times \text{Average volume per hectare/Rotation Period}$$

However, the sixth forest type (Juniper Rhododendron Scrub) is not considered for determining the AAC as tabulated:

Table 24: AAC for areas outside existing management regime

Sl No	Forest Type/ Working Circle	Gross Area (Ha)	Net Operable Area (70% of Gross Area)	Average Volume/ Ha	Rotation Period (Years)	Annual Allowable Cut/ AAC (m ³)
1	Blue Pine Forest	2363.43	1654.40	283.65	120	3910.59
2	Fir Forest	1068.87	748.21	283.65	180	1179.05
3	Hemlock Forest	7896.35	5527.45	283.65	160	9799.12
4	Spruce Forest	2090.43	1463.30	283.65	160	2594.16
5	Broadleaved Forest	465.11	325.58	283.65	100	923.50
6	Juniper Rodhodendron Scrub	1250.48	0	0	0	0
		15134.67				18406.42

So, the annual allowable cut (AAC) from Production Management Circle outside the existing management regime is worked out at 18406.42 cubic meter per year. Notwithstanding this desktop calculation, the actual volume available for sustainable management has to be validated through resource inventories.

2.5.2.2 Protection Management Circle

In line with restrictions/prohibitions imposed under Forest and Nature Conservation Act 2023 and Forest and Nature Conservation Rules and Regulations 2023 and its amend-

ment 2025, the following area are put under Protection Management Circle. This means sustainable forest management outside the existing management regimes need to consider these restrictions while executing any forestry operation including scientific thinning, rural and commercial timber allotments. In a nutshell, DFO Thimphu has 1822.76 hectares of state reserved forest land (SRFL) to be managed under Protection Area.

Table 25: Break down of Protection Management Circle outside the existing management regimes

Sl No	Protection layers/areas	Area (hectare)
1	Slope >45° (Soil Protection)	426.79
2	Important Cultural Site (500m buffer)	429.87
3	Stream (30m buffer)	831.98
4	Water Sources (30m buffer)	5.35
5	River (30m buffer)	128.77
Total		1822.76

2.5.2.3 Non-Production Management Circle

Areas which fall under Non-Production Management Circle outside the existing management regime of the division include the following land use types as generated from Land Use and Land Class (LULC 2016). This circle also used the available cadastral shapefile 2022. The total area under this management circle stands at 10378.61 hectare.

Table 26: Areas under Non-Production Management Circle outside existing management regime

Sl No	Non-Production Layers/Areas	Area (Ha)
1	Alpine Scrub	3277.64
2	Built up	408.91
3	Cadastral/cultivated agriculture	573.32
4	Meadows	1320.50
5	Non-built up	33.11
6	Rocky Outcrop	79.22
7	Shrubs	4439.62
8	Snow and Glacier	142.12
9	Water bodies	104.17
Total		10378.61

2.6 Local People and Livelihood

2.6.1 Demography and Social Structure

The Thimphu Dzongkhag has a population of 253287 where rural population comprise of 138736 and urban population as high as 114551 according to Population and Housing Census of Bhutan (PHCB 2017). It has relatively higher percentage of male population (52.3%) over female population (47.7%) in rural settings. Similar is the case with urban area where it is estimated at 51.5% male against 48.5% female population under Thim-

phu Thromde. Mewang Gewog has the highest number of households (875). In contrast, Dagala Gewog has as low as 140 households. Mewang Gewog also has highest population (7799) closely followed by Chang Gewog with 6752 while Geney Gewog has the lowest population of 1141 as per Statistical Handbook of Thimphu Dzongkhag, 2021.

Within the jurisdiction of the Divisional Forest Office in Thimphu, women head 60% of the households, while men lead the remaining 40%. The gewogs of Dagala, Geney, and Mewang are predominantly led by women, whereas Chang and Kawang have a slightly higher proportion of male-headed households as revealed from Socio-Economic Survey conducted in October- November 2023.

2.6.2 Literacy

The Thimphu Dzongkhag demonstrates a diverse literacy landscape, as revealed by the Bhutan Living Standard Survey (2017) conducted by the Bhutan Statistical Bureau (BSB). While the overall literacy rate stands at 66.4 percent, the adult literacy rate is notably lower at 60.6 percent. In contrast, the youth literacy rate shines remarkably at 92.8 percent, reflecting significant educational progress among younger generations.

These findings align with a recent socio-economic survey conducted by this division, which analyzed responses from 394 participants, predominantly elderly household heads. The survey highlighted that 45 percent of respondents were illiterate, underscoring the challenges faced by older populations in accessing education. Furthermore, 19 percent of respondents had attained primary-level education, while 10 percent had completed higher or middle secondary schooling. Notably, only 5 percent held a bachelor's degree, indicating a relatively low prevalence of higher education among adults.

This disparity in literacy rates across age groups underscores the need for targeted human resource development initiatives, particularly for adults, to bridge the generational gap in contributing towards sustainable forest management where most of the community-based forest management programs are currently headed by elderly people who lack competency as a result of low literacy or educational qualification. The figure 41 highlights the current literacy landscape of the five gewogs falling under this division. However, if households falling under Thimphu Thromde are considered for evaluating the literacy rate, it is likely to change the whole scenario as urban populations have higher literacy rate.

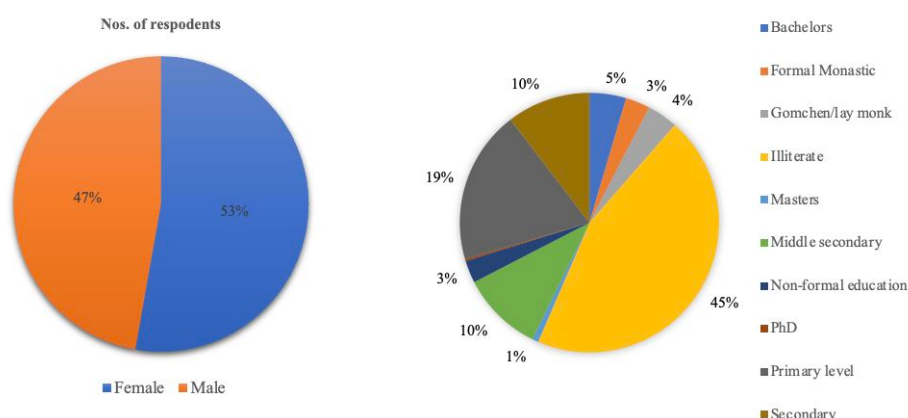


Figure 37: Literacy rate as per SES 2023

2.6.3 Livelihood and Income

In general, nine income sources were identified through the socio-economic survey conducted in the month of October -November 2023 covering 394 households spread over five administrative blocks (gewogs) viz Chang, Dagala, Geney, Kawang and Mewang. The total for each of these income sources were divided by 394 households to derive the average income from each category where it revealed that an average annual household income of communities under DFO Thimphu turned out to be around Nu. 250050.

Table 27: Income source of the communities

Income Source	Average Annual Income as per SES 2023
Agriculture	3856
Business	29426
Horticulture	3716
Labor	4297
Livestock	16325
Mushroom Farming	411
Other Sources	185813
NWFP	4302
Tourism	1904
Total	250050

This is further categorized into two broad categories viz On-farm and Off-Farm income sources as indicated in table 28.

Table 28: Income sources from on-farm and off-farm activities

On-Farm	
Income Source	Ngultrum/Year
Agriculture	3856
Horticulture	3716
Labor	4297
Livestock	16325
Mushroom Farming	411
Sub Total (A)	28605
Off-Farm	
Business	29426
Other Sources	185813
NWFP	4302
Tourism	1904
Sub Total (B)	221445
Total (A) + (B)	250050

The total annual income from combined on-farm and off-farm activities amounts to Nu. 250,050 per household in general, showcasing the diversity of income sources. On-farm activities contributed Nu. 28,605, with livestock farming leading the way at Nu. 16,325, followed by labour at Nu. 4,297) and agriculture at Nu. 3,856.

Off-farm activities contributed a more substantial Nu. 221,445, with business income at Nu. 29,426, supplemented by significant earnings from other sources amounting to Nu. 185,813. Additionally, non-wood forest products (NWFP) add Nu. 4,302, and tourism generates Nu. 1,904. This financial breakdown reflects a balanced integration of agricultural, entrepreneurial, and alternative livelihood strategies, emphasizing resilience and adaptability in income generation. This finding therefore aligns with lowest poverty rate calculated at 1.1 percent by Bhutan Living Standard Survey conducted in 2017.

2.6.4 Livestock Management and Challenges

Livestock farming plays a vital role in supporting community livelihoods. With advancements and substantial support from the government, livestock farming has seen remarkable growth, particularly in commercial ventures. Jersey and poultry farming, in particular, has been widely embraced by families to enhance their household income.

However, livestock management faces threats from wild predators killing as high as 10 jersey breeds across three years (2021-2023) followed by local cattle breed as indicated in the figure 42. In general, all the six types of livestock reared by the local community face threats from wild predators in one way or other demanding appropriate management practices or interventions.

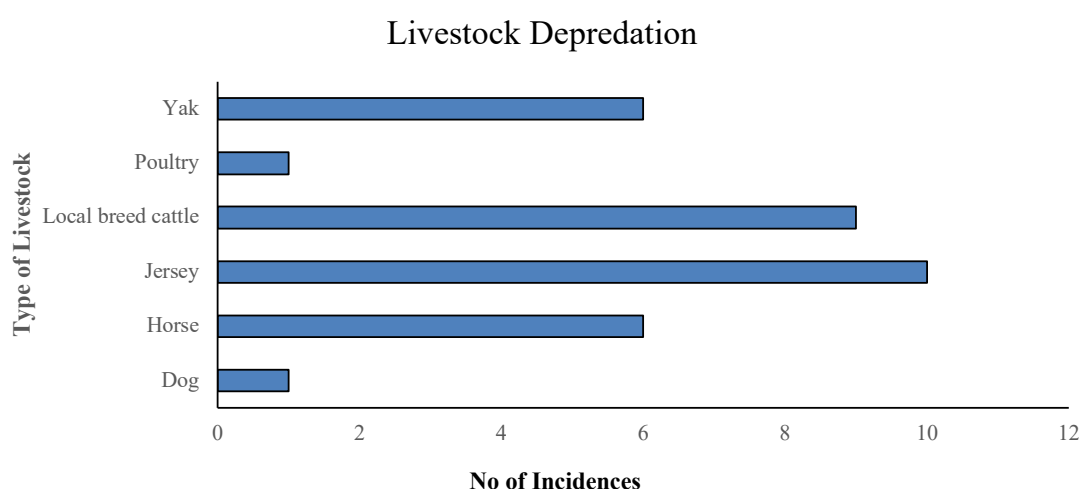


Figure 38: Livestock depredation incidences recorded between 2021–2023

2.6.5 Agricultural Practices and Challenges

Agricultural practices under the jurisdiction of the Divisional Forest Office, Thimphu reflect the harmonious existence between local communities and their environment, rooted in traditional wisdom and evolving with modern technologies. Rice cultivation stands as the cornerstone of food security in most gewogs, with the exception of Dagala, where the landscape and climatic conditions favor alternative crops. Wetland (Chhu-zhing) fields are vital for paddy cultivation in gewogs such as Chang, Geney, Kawang, and Mewang. Local farmers cultivate rice as a staple food crop, employing sustainable farming techniques that have been passed down through generations. Alongside rice, communities also cultivate a diverse range of vegetable crops, including chili, potato, beans, and leafy greens like sag. These vegetables form an essential part of their diet and are grown in kitchen gardens and small plots near their homes, contributing to both household nutrition and local market supply.

Horticulture is another significant agricultural activity practiced across the gewogs. Apples, in particular, are widely grown and hold both cultural and economic value. Farmers nurture these orchards and the harvested fruits are often sold in domestic markets or exported, providing a steady source of income. Additionally, cash crop farming plays a vital role in the agricultural economy of the region. Potatoes, carrots, cabbage, and asparagus are among the most commonly cultivated cash crops, valued for their high demand and profitability. These crops are grown on drylands (Kamzhing) and contribute significantly to the livelihoods of the farming communities. The cultivation of these crops is supported by the government through the provision of improved seeds, technical advice, and marketing assistance, enabling farmers to adopt sustainable practices while boosting productivity. Collectively, these diverse agricultural endeavors not only ensure food security and income generation but also showcase resilience and adaptability of the communities.

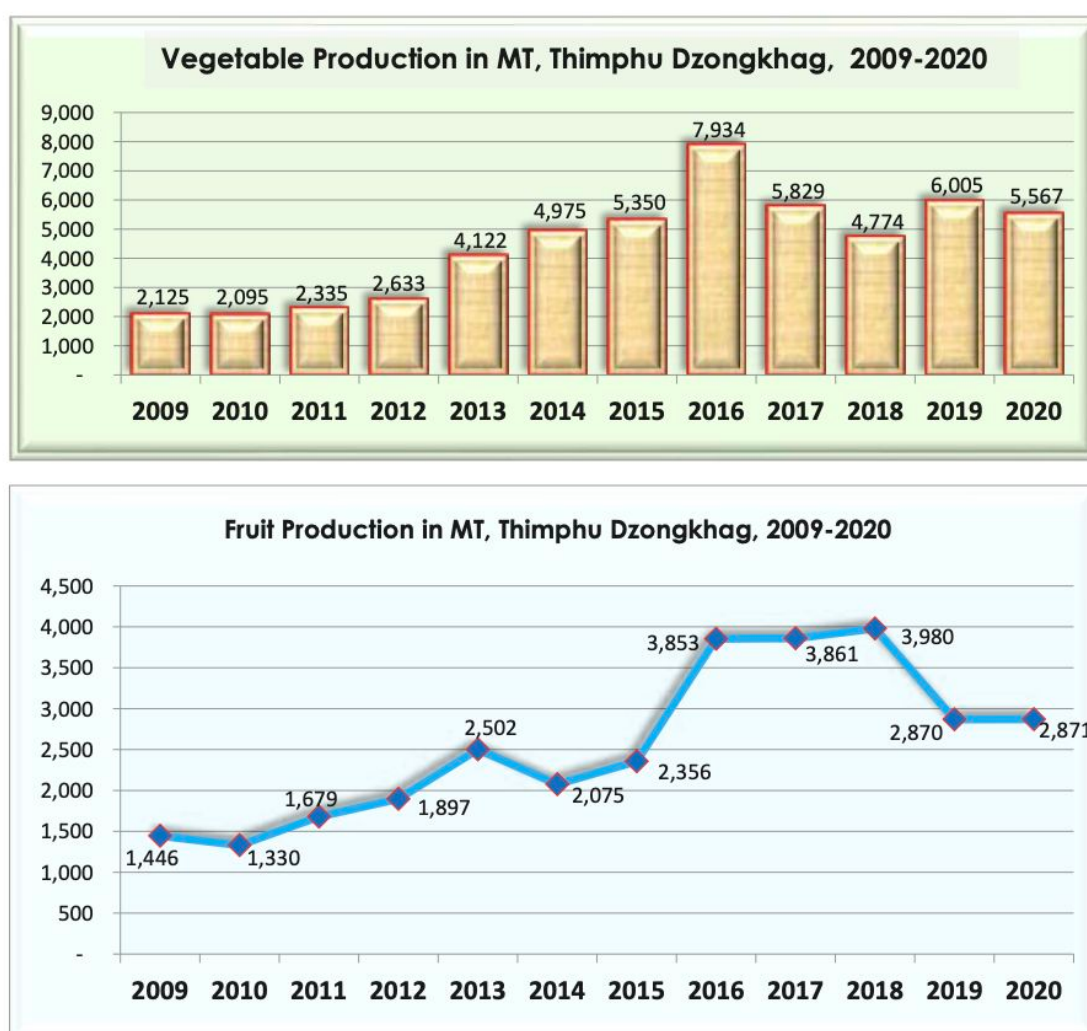


Figure 39: Vegetable and Fruit production between 2009 to 2020 (SHBTD 2021)

Challenges associated with agriculture include irregular rainfall pattern induced by climate change, shortage of irrigation water, crop depredation by wild animals particularly from ungulates, pest and disease and shortage of farm work force during peak agriculture season.

2.6.6 Land Holdings

Communities within the jurisdiction of the Divisional Forest Office (DFO) in Thimphu hold an average land area of 1.14 acres per household where significant portion of land (68%) is dedicated to Kamshing (dryland cultivation) with only 24% being utilized as Chhuzhing as indicated in figure 40.

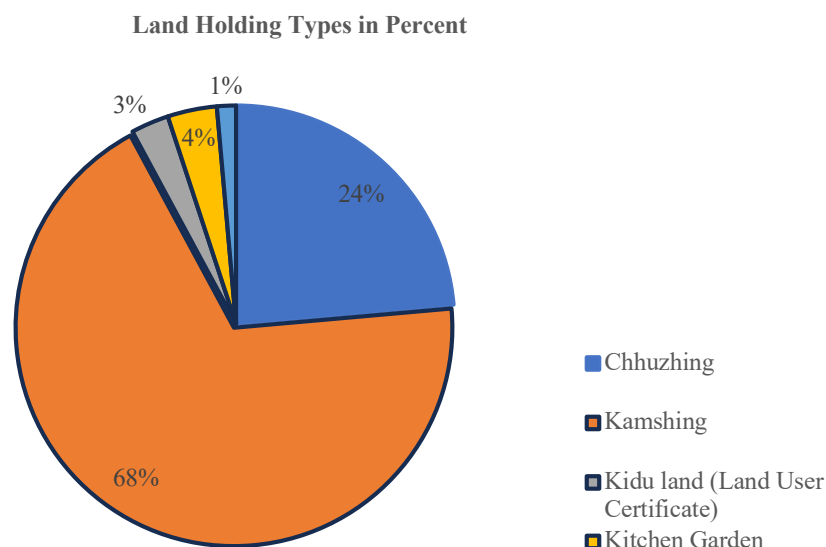


Figure 40: Land holding by percent (SES 2023)

However, this is the figure is captured from Socio-Economic Survey conducted with sampling intensity taken at 20% where only 394 households were interviewed. Nonetheless, it serves as a basis to understand the overall agricultural landscape under the division as people tend to pay less attention in cultivating paddy due to water scarcity and human wildlife conflict issues.

According to available secondary data as sourced from Statistical Handbook of Thimphu Dzongkhag 2021, it exhibits a varying patterns of land use and utilization. In Chang gewog, out of the total 1,472.29 acres of actual landholding, only 618.84 acres (42.03%) are cultivated. This includes 30.16 acres of wetland, 344.47 acres of dry land, and 244.21 acres of orchards. In Dagala gewog, with a modest actual landholding of 34.23 acres, 29.7 acres (86.77%) are utilized, comprising 28.4 acres of dry land and 1.3 acres of orchards. Similarly, in Geney gewog, 417 acres (66.12%) of the total 630.71-acre landholding are cultivated, consisting of 62 acres of wetland, 330 acres of dry land, and 25 acres of orchards.

Kawang gewog has a significantly larger landholding of 1,447.01 acres, but only 277.86 acres (19.20%) are cultivated, including 65 acres of wetland, 190 acres of dry land, and 22.86 acres of orchards. Mewang gewog holds the largest land area, with 2,335.84 acres, of which 1,540 acres (65.93%) are cultivated. This comprises 340 acres of wetland, 980 acres of dry land, and 220 acres of orchards. These figures therefore highlight the disparities in land utilization across the gewogs, influenced by various factors such as geography, land type, agricultural practices and challenges induced by climate change and human wildlife conflict issues

2.7 Human Wildlife Conflict

Human-Wildlife Conflict (HWC) is a globally recognized challenge that often results in significant economic and social repercussions, ranging from property damage to severe injury cases and even loss of human life. Such conflicts arise from the inevitable competition for resources and the shared use of space between humans and wildlife, underscoring the delicate balance between coexistence and survival.

Data gathered from 394 respondents (Socio-Economic Survey 2023) revealed 221 incidences of Human-Wildlife Conflict (HWC) reported over the past three years (2021–2023). Of these incidents, crop damage accounted for the majority at 178 cases, followed by livestock depredation with 33 cases and 10 cases on property damage.

The breakdown of HWC across five Gewogs further illustrates several dynamics where 45.2% of respondents experienced crop damage, 8.4% faced livestock depredation and 2.5% reported property damage.

So, these findings highlight the significant yet varied effects of human-wildlife interactions, emphasizing the need for targeted interventions to mitigate conflicts.

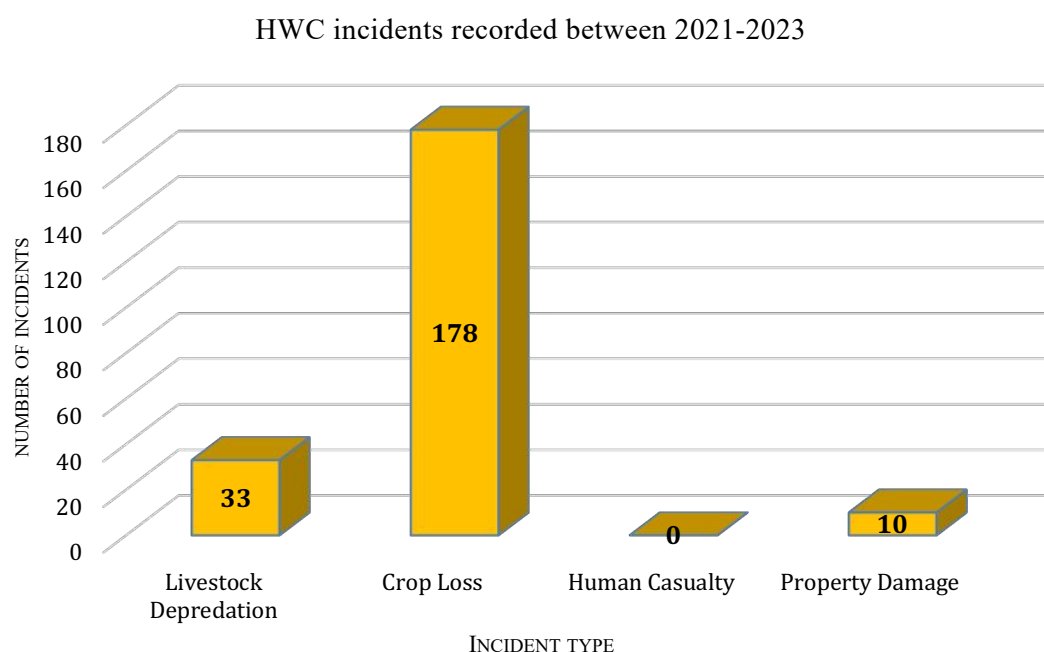


Figure 41: Human Wildlife Conflict scenario between 2021-2023 (SES 2023)

The findings from Socio-Economic Survey also highlight the financial impact in reference to crop losses across five Gewogs over the past three years. Among all, Mewang Gewog experienced the highest crop loss with monetary value as high as Nu. 840,750, reflecting the severity of wildlife-related crop damage in the gewog.

Kawang Gewog recorded the second-highest crop loss at Nu. 159,300, followed by Geney Gewog, which reported losses totaling to Nu. 118,450. Chang Gewog incurred relatively lower crop damage, with losses valued at Nu. 42,500. Notably, Dagala Gewog reported no monetary loss in terms of crop damage. However, it suffered the highest conflict in terms of livestock depredation recording the highest livestock kill incidences during the same period. The survey also revealed that Dagala Gewog does not depend

much on agriculture farming. Instead, local communities of Dagala depend largely on livestock and off-farm activities.

The findings therefore underscore a significant economic burden human-wildlife conflict places on rural communities, particularly in Gewogs like Mewang, where crop losses are substantial as indicated in figure 42.

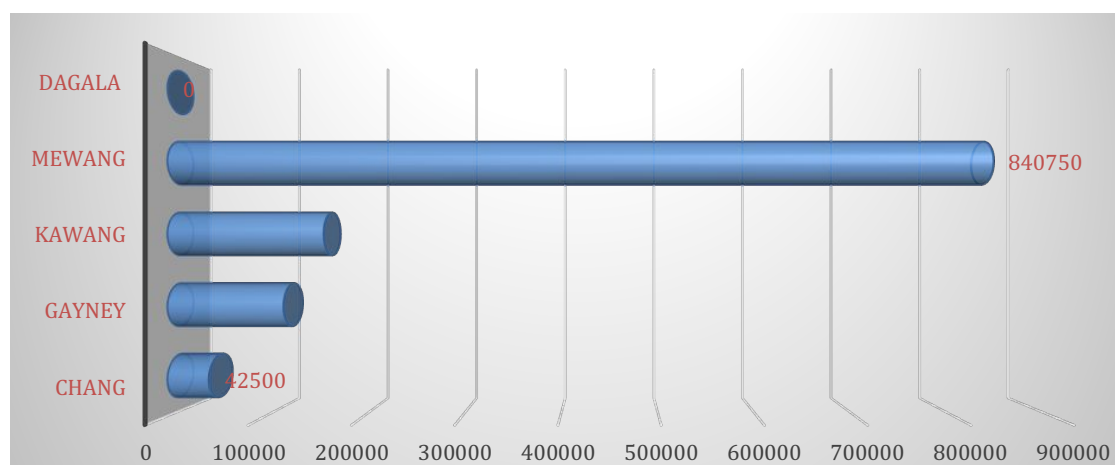


Figure 42: Monetary loss as a result of HWC by Gewog (SES 2023)

2.8 Climate Change and its impacts

2.8.1 Present climatic conditions in the area

Areas or gewogs under DFO Thimphu experience a quite a diverse range of climatic conditions due to its altitudinal variation which spans from 2060 meters to 4743 meters above sea level. The lower elevations are characterized by a temperate climate with warm summers and cool winters while the higher altitudes endure a harsh alpine climate with short mild summers and long, severely cold winters.

During the summer months, the DFO Thimphu receives moderate to heavy monsoon rain, especially in the lower regions, making it a crucial season for agriculture. Spring and autumn are generally mild and pleasant, with clear skies and moderate temperatures, making these seasons ideal for farming and outdoor activities. In contrast, winters bring freezing temperatures, particularly in higher elevations, with occasional snowfall blanketing the upper areas.

The maximum temperature peaks in June, reaching approximately 30°C, reflecting the height of summer. July and August also experience high maximum temperatures, hovering close to 28°C. During the winter months, particularly December to January the maximum temperature drops significantly to about 15°C, while the minimum temperature plunges to nearly 5°C, marking the coldest period of the year. A gradual increase in both maximum and minimum temperatures pick from February through May, signaling the transition from winter to summer. Similarly, one shall notice a steady decline in temperature from September through November as the region moves into the colder months.

The highest precipitation is usually observed in between June to September where July tends to peak at c.144mm, marking the height of the monsoon season. In contrast, the lowest precipitation usually between November to January where November recorded

with virtually no rainfall (0 mm) as per climate data used from NCHM.

To summarize, throughout the year, the precipitation pattern gradually increases from February through July and then steadily decreases from September onward. So, this marks the start of fire season making coniferous forests highly susceptible to forest fires during dry winter months.

2.8.2 Farmers' vulnerability to climate change and peoples' perceptions

Vulnerable areas/gewogs are located along the central part of Thimphu District (refer figure 43 Vulnerability Map), This suggests that edge effects, potentially driven by factors like human activity, land use change, and exposure to climatic extremes, play a significant role in vulnerability within these regions (Dantas de Paula et al., 2016). Several isolated patches of high vulnerability are also observed within the central and northern parts of Thimphu. This could be associated with fragmented forest cover or proximity to human settlements (Thakur et al., 2021). Additionally, factors like land use changes, forest fragmentation and anthropogenic pressures are identified as one of the existing problems to climate vulnerability globally (Roshani et al., 2022). The more forested gewogs of Thimphu are observed to be less vulnerable, particularly in northern and eastern part of the divisional area where large, contiguous forest areas are present. This suggests that intact forest cover and potentially favorable climatic conditions contribute to greater resilience within these areas (NEC, 2019).

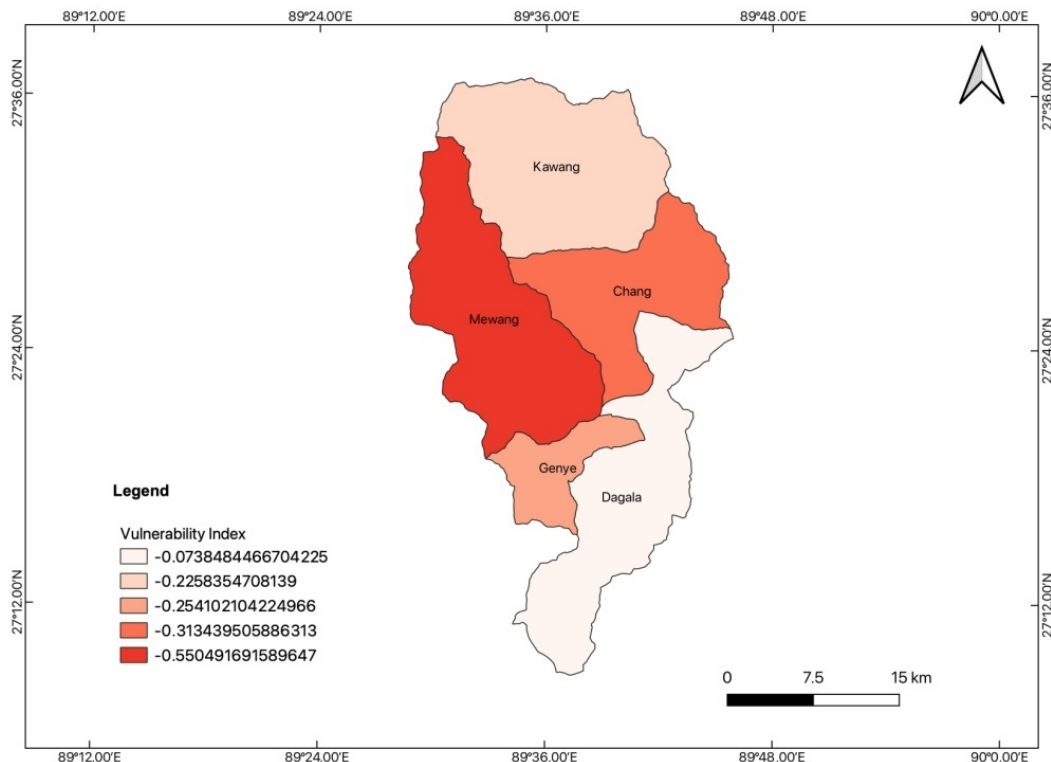


Figure 43: Climate Vulnerability by Gewog

Among the gewogs, Mewang records the lowest vulnerability score (−0.550), indicating comparatively lower resilience than the other four gewogs. This is primarily due to its high exposure value (0.54290) combined with moderate sensitivity (0.29555) and the lowest adaptive capacity (0.28796), reflecting a limited ability to effectively cope with external shocks or climate-related impacts.

Dagala, although having the highest exposure value (0.546), demonstrates a low vulnerability score (−0.074). This suggests that its low sensitivity (0.051) and strong adaptive capacity (0.524) effectively offset the risks associated with high exposure. In contrast, Chang shows a moderate vulnerability score (−0.313), characterized by relatively moderate levels of exposure (0.463), sensitivity (0.236), and adaptive capacity (0.386).

Similarly, Genye and Kawang exhibit moderate vulnerability scores of −0.254 and −0.226, respectively. Both gewogs show higher sensitivity levels (0.277 for Genye and 0.309 for Kawang), indicating that despite lower exposure than Dagala, higher sensitivity contributes to their overall vulnerability.

Overall, vulnerability levels vary across the gewogs, with Mewang emerging as the most vulnerable, followed by Chang Gewog. Genye and Kawang display moderate vulnerability, while Dagala remains the least vulnerable. This highlights the combined influence of exposure, sensitivity, and adaptive capacity in shaping resilience to external risks, as presented in Table 26.

Table 29: Climate vulnerability indices of the gewog

Gewog	Vulnerability	Exposure	Sensitivity	Adaptive Capacity
Chang	-0.313439506	0.46287367	0.236489225	0.38592339
Dagala	-0.073848447	0.546221308	0.051491258	0.523864119
Genye	-0.254102104	0.412883594	0.276985302	0.435766792
Kawang	-0.225835471	0.357744136	0.309436614	0.44134528
Mewang	-0.550491692	0.542903573	0.295550071	0.287961952

2.8.3 Trend of climate parameters

Contrary to the widely perceived change of climate parameters like temperature and precipitation as reported by local communities (394 respondents) who were interviewed for climate vulnerability assessment in 2023, the climate data on temperature as shared by National Center for Hydrology and Metrology do not indicate increasing trend despite the commonly perceived opinion of the communities (refer figure 44). However, precipitation seems to show a decreasing trend as we looked at the precipitation data from 2014 to 2023 (refer figure 45).

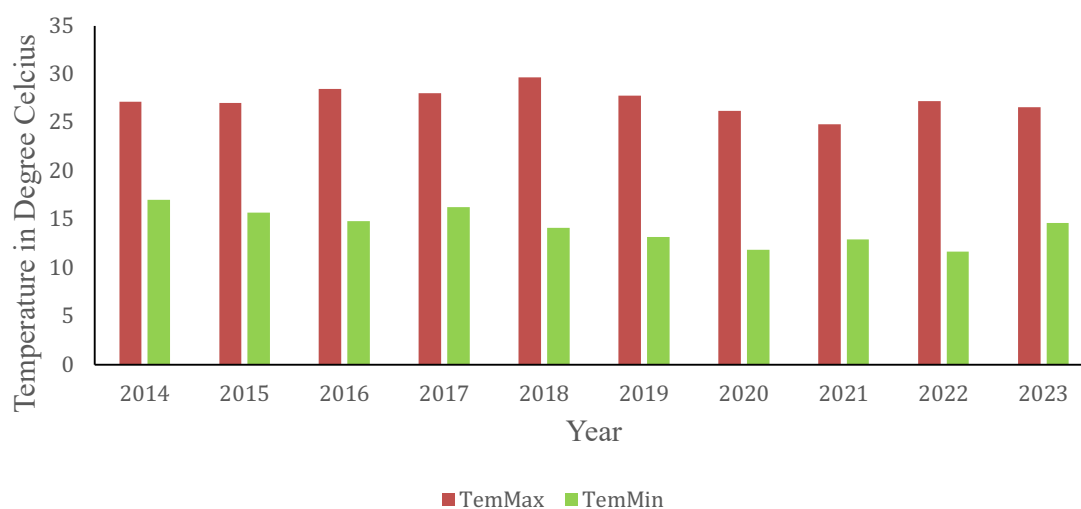


Figure 44: Yearly average temperature record of the division

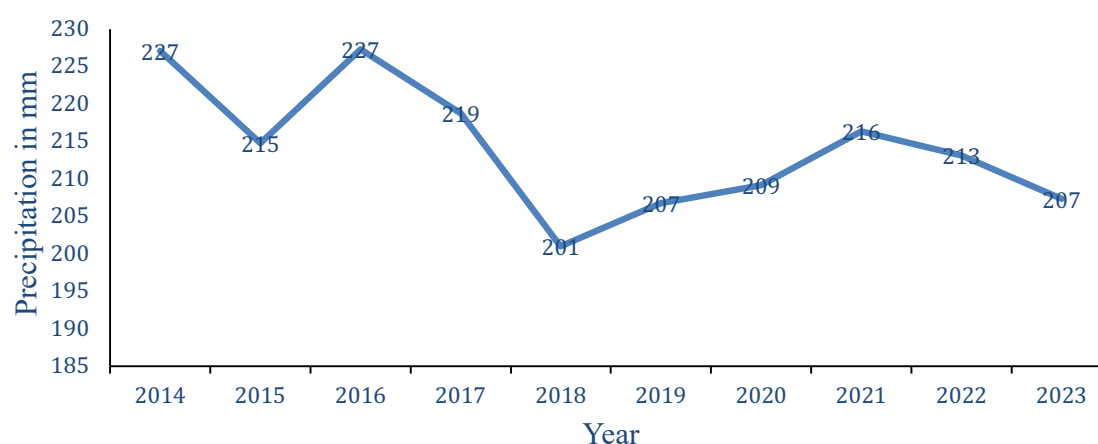


Figure 45: Yearly average precipitation records of the division

2.8.4 Impact of climate on vegetation and wildlife

Climate is a fundamental force shaping the distribution of vegetation and the structure of ecosystems (Sykes, 2009). However, shifts in key climatic variables, notably temperature and precipitation, are increasingly threatening forest health and stability (Gonzalez et al., 2010). In Thimphu, these impacts are becoming evident, as communities report severe increases in annual temperatures despite National Center for Hydrology and Meteorology (NCHM) data showing no consistent rising trend. Conversely, annual precipitation shows a clear decreasing trend, raising concerns over its long-term implications for forest ecosystems.

The combined effects of extreme temperatures and declining precipitation are driving vegetation die-back, particularly in conifer forests. These climatic stressors weaken forest stands, making them highly vulnerable to pests and diseases. Outbreaks of bark beetles and parasitic mistletoe are increasingly reported, exacerbating forest decline. Bark beetle infestations, in particular, thrive under warmer conditions and weakened tree defenses, leading to widespread tree mortality and further disruption of forest ecosystems.

These changes not only diminish forest productivity but also reduce food resources for wildlife, driving animals closer to human settlements in search of sustenance and intensifying human-wildlife conflicts. Furthermore, shifts in rainfall seasonality and frequent temperature extremes compound these threats, destabilizing forest health and reducing ecological resilience.

Addressing forest die-back and bark beetle infestations requires urgent attention, including monitoring, pest management strategies, and efforts to enhance forest resilience against the cascading impacts of climate change.

2.8.5 Adaptation/mitigation measures adopted

The impacts of climate change, as reported by communities across five gewogs (N=394), reveal the challenges faced at the local level and the adaptive strategies employed to mitigate them. Among the most significant climate-induced impacts is extreme temperature, which adversely affects crop and milk production, increases pests and diseases, causes tree dieback, and leads to the range shift of animals and plants. More critically, extreme temperatures contribute to the drying of water sources and an increased frequency of forest fires. In response, local communities have adopted strategies such as cultivating heat- or cold-resistant crops and supplementing agricultural activities with regular irrigation to counter these challenges.

Another major concern is the shift in rainfall seasonality, which communities associate with reduced crop yields, diminished water availability, and a surge in pests and diseases. Additional consequences include changes in plant phenology and range shifts in animal and tree species. To address these impacts, communities have adjusted by changing crop types, implementing irrigation systems, and performing rituals to seek favorable conditions.

Extreme events such as heatwaves, landslides, seasonal droughts, and windstorms have also been reported as significant threats. Heatwaves alone were highlighted by 73 respondents, while 93 respondents raised concerns about windstorms. These events have further strained local livelihoods, requiring resilience and resourcefulness in adapting to their effects.

A particularly pressing issue is the drying up of water sources and tree dieback, with the majority of reports coming from Mewang Gewog. Respondents identified frequent forest fires during the dry winter and early spring as a key driver of these issues, disrupting local climatic patterns and exacerbating vulnerabilities.

These observations underline the interconnectedness of climate-induced impacts and the urgent need for adaptive strategies that blend traditional knowledge with innovative approaches. The resilience demonstrated by local communities, despite these challenges, reflects their commitment to preserving their livelihoods and ecosystems in the face of a changing climate.

2.9 High Conservation Value Areas

2.9.1 Overview of the HCVA

Globally the concept of High Conservation Value (HCV) was first introduced in 1998 by the Forest Stewardship Council (FSC), an international non-profit multi-stakeholder organization established in 1993. The purpose of its inception was to use it as a tool and framework to protect important environmental, social and cultural values within forest landscapes with six HCV categories where the definition for each of the six HCV categories as per HCV Common Guidance are as follows:

1. **Species Diversity:** Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
1. **Landscape-level ecosystems:** Ecosystem mosaics and IFL. Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
1. **Ecosystems and habitats:** Rare, threatened, or endangered ecosystems, habitats or refugia.
1. **Ecosystem services:** Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
1. **Community needs:** Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc...), identified through engagement with these communities or indigenous peoples.
1. **Cultural values:** Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

Similarly, the National Interpretation (NI) for Identification of High Conservation Values in Bhutan 2022 also uses the same HCV Common Guidance for identification of HCVs with few additions based on national significance. The NI document outlines six major opportunities, which include:

1. Protection and promotion of biodiversity conservation
2. Promotion and preservation of cultural values
3. Safeguarding the ecosystem provisions to meet community needs and services
4. Strengthening of conservation legislation
5. Strengthening of carbon neutrality and build climate resilience
6. Promote multi-stakeholder engagement and enhance integrated management

2.9.2 Identification of HCVA and screening process

Considering its scope and opportunities and as a requirement of the Living Landscape Project, Divisional Forest Office, Thimphu like eight other Divisional Forest Offices, identified potential HCV candidates so that at least one HCVA is mainstreamed into the DFO Management Plan.

In doing so, a several rounds of inhouse meetings/discussions were held to identify potential HCV candidates based on NI Document. Looking at the definitions given for each of the six HCV categories and prevalence of areas which exactly or partially aligns with the definitions provided in the NI Document, DFO Thimphu could initially think of four HCV Categories viz Species Diversity; Ecosystem Services; Community Needs and Cultural Values as tabulated:

Table 30: Potential HCV candidates as identified through series of in-house discussion

HCV Category	Location	Priority	Remarks
HCV 1: Species Diversity	Zatola under Kawang Gewog where concentration of biological diversity including endemic, rare, threatened or endangered species occupy the same habitat	3	Based on images captured from National Snow Leopard and Tiger Survey
	Jigme Langtsho: Overlap of Tiger and Snow Leopard habitat	4	Based on images captured from National Snow Leopard and Tiger Survey
HCV 4: Ecosystem Services	Phajoding Water Catchment Area	2	Considering its significance for serving as one of the major water sources for Thimphu Thromde
	Dagala Water Catchment Area	1	Considering its significance for serving as one of the major water sources for Thimphu Thromde covering South Thimphu
HCV 5: Community Needs	Matsutake Mushroom Growing Area under Geney Gewog	5	It is one of the existing NWFP growing areas with strong community-based resource management practice where community livelihood is enhanced through formation and management of mushroom
HCV 6: Cultural Values	Forest Area surrounding Tselungney under Mewang Gewog	6	Tselungney is one of the cultural sites with huge conservation significance contributing towards protection and conservation of water catchments and forest resources

Those were the potential HCV candidates identified or proposed by the division based on available data, field observation and expert knowledge. However, a robust and standard screening process was felt necessary which led to HCV screening at the landscape level coordinated by Project Coordination Unit, WWF Bhutan.

The screening process was therefore done at two levels where landscape level screening was conducted in April 2023 led by a consultant/expert from HCV Network. Spatial analysis of the IKI living landscape was conducted to define the geographic scope using the spatial data maintained at the department and division. With the technical input from HCV Network, data gap analysis was conducted before the actual screening process. Both primary and secondary data sources such as on Tiger, Snow Leopard, Red Panda, NFI surveys including wildlife observation in SMART data for species distribution were gathered. SMART data was also used for the threat analysis at the IKI living landscape level.

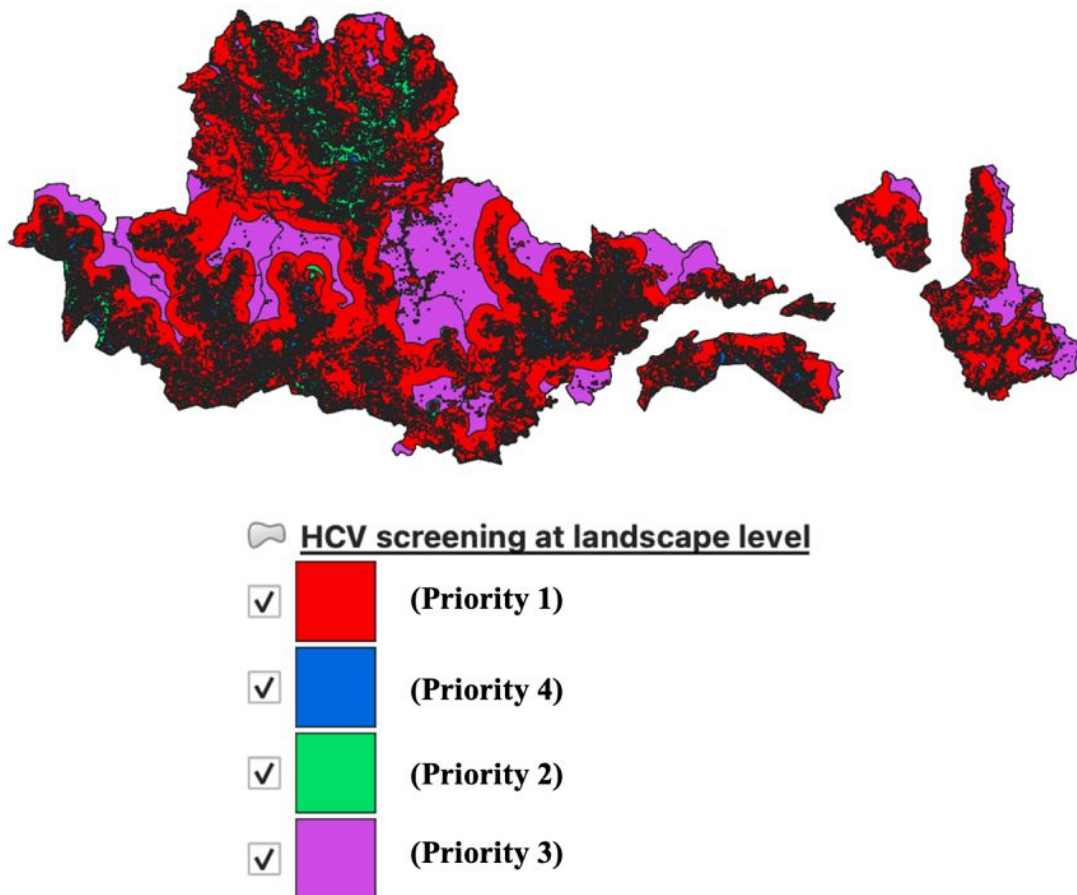


Figure 46: HCV Screening at IKI Living Landscape level

Following the screening at the landscape level, screening and validation exercise was further executed at the division level using the results from landscape level screening. It basically involved cross-checking with the available data such as technical reports, FIRMS and SMART data. The process also involved consultation with relevant stakeholders and institutions.

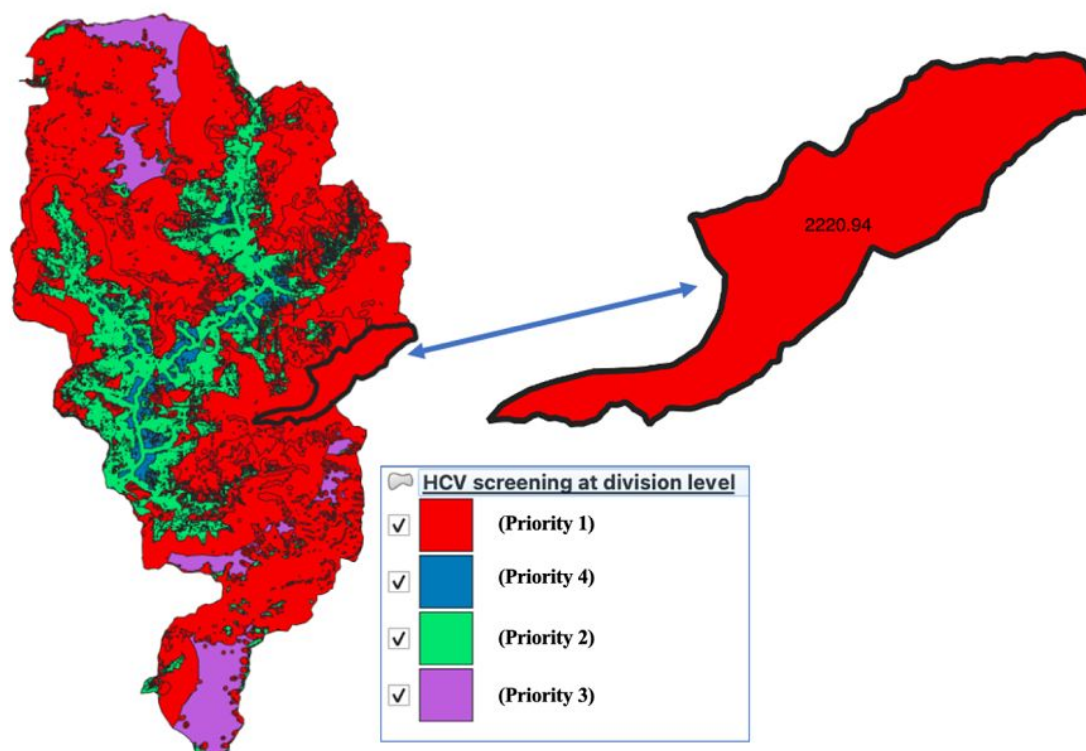


Figure 47: HCV screening, validation and prioritization at division level

2.9.3 HCVA for DFO Thimphu

Looking at the screening result at the division level (figure 47) probability of HCV presence was high and covered at least 80% of the division area. However, not all the HCVs may require same level of attention and therefore prioritization was done considering the urgency, significance and the availability of resource to manage the identified HCV.

Since the HCV is being prioritized based on springshed or water catchment, it is named as “Dagala Water Catchment Area” which falls entirely within the administrative boundaries of Dagala Gewog between N27°18’ & E89°39’ and N27°27’ & E89°45’. It covers an area of 2220.94 hectare, predominantly covered by Mixed Conifer Forest (LULC 2016). The altitude of the area ranges from 2900 to 4200masl (DEM12).

The HCV area for this division is capped at 2220.94 hectare as almost 70% of the division is already under one form of management regimes, be it area-based management regime or cross-cutting management regime.

2.9.4 Significance of the HCVA

Among the six HCV candidates initially proposed for screening (refer to Table 17), HCV Category 4: Ecosystem Services (Dagala Water Catchment Area), identified under Dagala Gewog, stands out as the most critical and immediately significant. This is because it embodies an exceptional blend of both ecological and socio-economic values. Serving as a vital water recharge zone, it serves as an essential source of drinking water not only for the rural communities of Dagala and Chang Gewogs but also for a substan-

tial number of urban households. A large portion of South Thimphu's residents depend directly on the pristine water which originate from this catchment area.

Beyond its indispensable role in spring-shed functions, the area harbors a wealth of additional values, including intact forest cover, unique cloud forests, rich species diversity and crucial community need (NWFPs). Moreover, it supports traditional livelihoods by serving as an important winter grazing ground (rangeland) for the yak herders of Daga-la Gewog. In terms of species diversity, the site is found to hold wildlife such as tiger, musk deer and red panda.

The ecological and socio-economic significance of this area is profound, with certain ecological values being irreplaceable due to their non-renewable nature and the vast number of beneficiaries reliant upon it. Notably, Thimphu Thromde remains one of the major beneficiaries, drawing vital ecosystem services, particularly the supply of clean water for its urban dwellers.

2.9.5 Threats to HCVA

Values are associated with certain type and/level of threats which need to be addressed to maintain its presence over the time. Similar to screening of values, threats to HCVs were identified/screened using the SMART data maintained at the department. For instance, from the long list of threats to six HCV categories, the threats to HCV Category 4: Ecosystem Services were identified as:

1. Forest Fire
2. Illegal Logging
3. Road Development
4. Forest pest and disease

The level and extent of the threat is as indicated in figure 48.

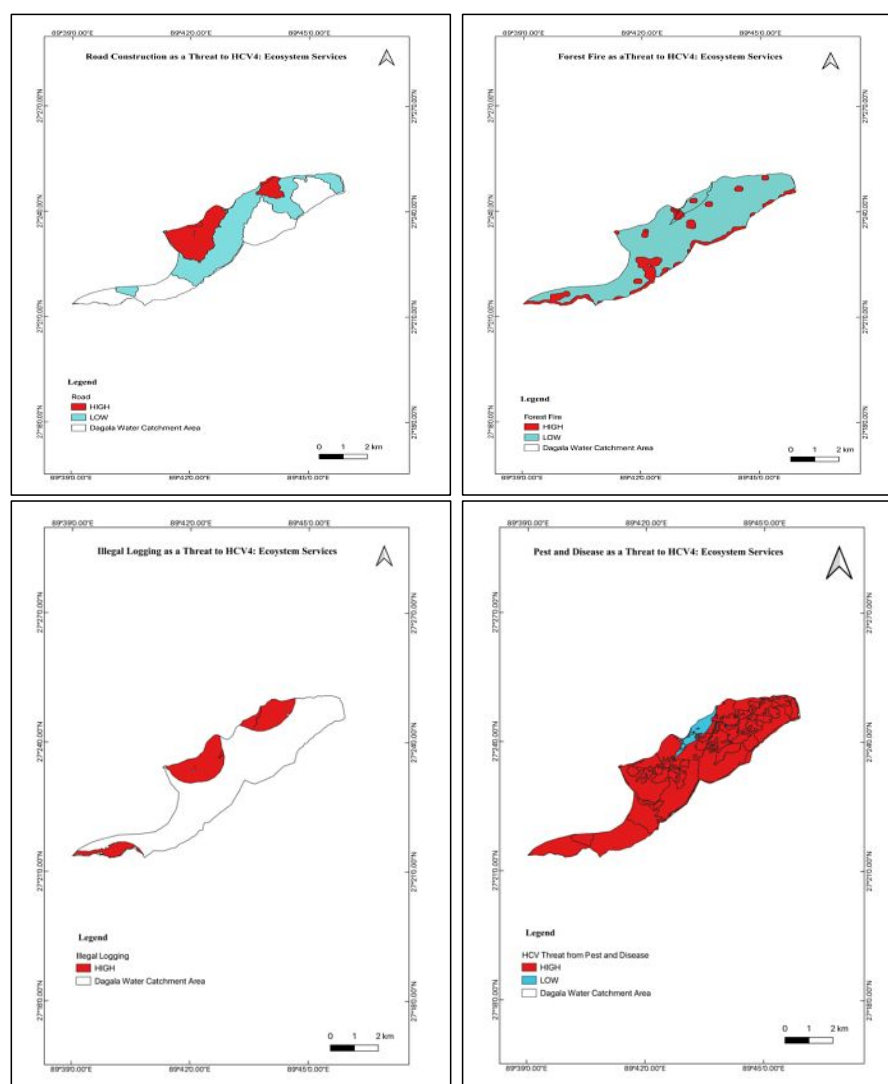


Figure 48: Four direct threats to HCVA, Dagala Water Catchment Area

So, based on the screening at the landscape level and validation exercise undertaken by the division, the HCVA identified under the Divisional Forest Office, Thimphu falls under Priority 1 (High HCV Probability and High Threat) necessitating active response. The responses or management prescriptions to address the threats are outlined under Chapter 4 (refer table 36).

2.9.6 Monitoring of HCVA

Existence of the values associated with Dagala Water Catchment Area (HCV 4: Ecosystem Services) will be determined by the level of attention given towards mitigating the threats. Additionally, participation and collaboration among relevant stakeholders are likely to make difference. So, the HCV will be monitored following the monitoring framework exercised by the Department of Forest and Park Services where Annual monitoring will be done by the division. Similarly, the Mid-Term evaluation and final evaluation will be executed by Forest Monitoring and Information Division (FMID) instituted under DoFPS (refer Chapter 6, table 42).

Chapter 3: Threats and challenges

The key conservation threats and challenges for DFO Thimphu were identified through a SWOT analysis. This process identified a total of nine conservation threats and four key challenges. The identified threats include forest fire; illegal activities; climate change and drying of water sources; forest pests and diseases (tree die-back); mining and logging; developmental activities; muck dumping in SRFL; land encroachment; and invasive species. The key challenges identified are human–wildlife conflict; increasing demand for forest produce; delayed services and weak enforcement; and waste dumping in SRFL. Although categorized separately as threats and challenges, both require appropriate levels of intervention to minimize their impacts.

3.1 Threats

3.1.1 Forest Fire

According to a publication titled Drivers of Deforestation and Forest Degradation in Bhutan (MoAF, 2017), forest fire is identified as one of drivers of forest degradation impacting an annual average of 6260 hectares with future projection of 93800 hectares between 2017 and 2030. Thimphu district lost as high as 1927 hectares of forest area between 2000 and 2015. Similarly, Annual Forestry Statistics 2023 which reports at the national level reported as high as 10059.31 hectares of forest area being burnt by forest fire where Divisional Forest Office, Thimphu contributed 257.24 hectares of blue pine forest.

So, forest fire poses a persistent threat to sustainable forest management, especially in districts with conifer forests. The Divisional Forest Office, Thimphu, situated in a temperate region where conifer forest dominate the division landscape by 505.304sqkm against 876.412sqkm faces frequent forest fire outbreaks. This threat intensifies with the onset of winter in November and typically extends until May, impacting large forested areas (IFFN, June 2006).

While forest fires are usually anthropogenic in nature and occur accidentally from burning of agricultural debris, setting campfires, picnicking, and cigarette butts left behind by smokers, a significant causal factor recorded by the Divisional Forest Office is electrical short circuits. The existence of extensive transmission lines network running across vast forest areas has made electrical malfunctions a primary contributor to forest fire incidents. Some forest fires are also intentional in nature, set by livestock herders to promote grass growth.

Data available with the division indicates that 24 fire incidents occurred across two fire seasons between 2023 and 2024 alone, impacting as high as 774 acres of forested land, Blue Pine forests being the most affected forest type, damaging 772 acres. Regarding timber resources, 15,477 trees and poles were damaged, equating to approximately 103,878 cubic feet of timber.

Electrical short circuits accounted for half of these fire incidents. Notably, at least fifty percent of the fire incidences were recorded within the Thimthrom, where human population density and the transmission line network are the highest.

A SWOT analysis identified forest fire as one of the threats to biodiversity conservation. This threat impacts four of the five conservation objectives set for next ten years revealing a medium to high threat level as per threat ranking exercise executed using Miradi tool.

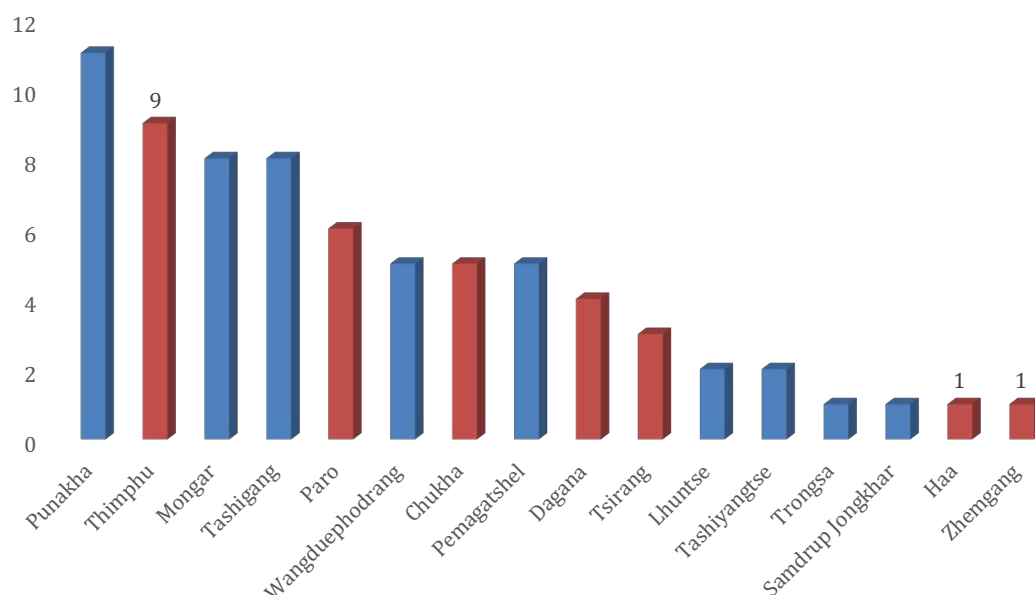


Figure 49: Dzongkhag wise forest fire incidences recorded in 2023 (Source: Annual Forestry Statistics 2023)

3.1.2 Illegal Activities

Illegal forestry activities represent a broad spectrum of unlawful actions that involve the unauthorized harvesting, possession, transportation and trade of forest products including wildlife and their parts. These illegal practices are primarily fueled by the ever-growing demand for forest products, the rapid expansion of road networks that improve access to remote areas, and the lack of sustainable livelihood alternatives for local communities. Furthermore, inadequate monitoring and enforcement attributed by limited manpower and resource constraints, significantly contribute to the persistence of such activities. DFO Thimphu faces these challenges manifested through various forms, including illegal logging, unauthorized timber trading, unsanctioned harvesting of non-wood forest products (NWFPs), land encroachment, unlawful fishing and poaching of wildlife species, as illustrated in figure 50.

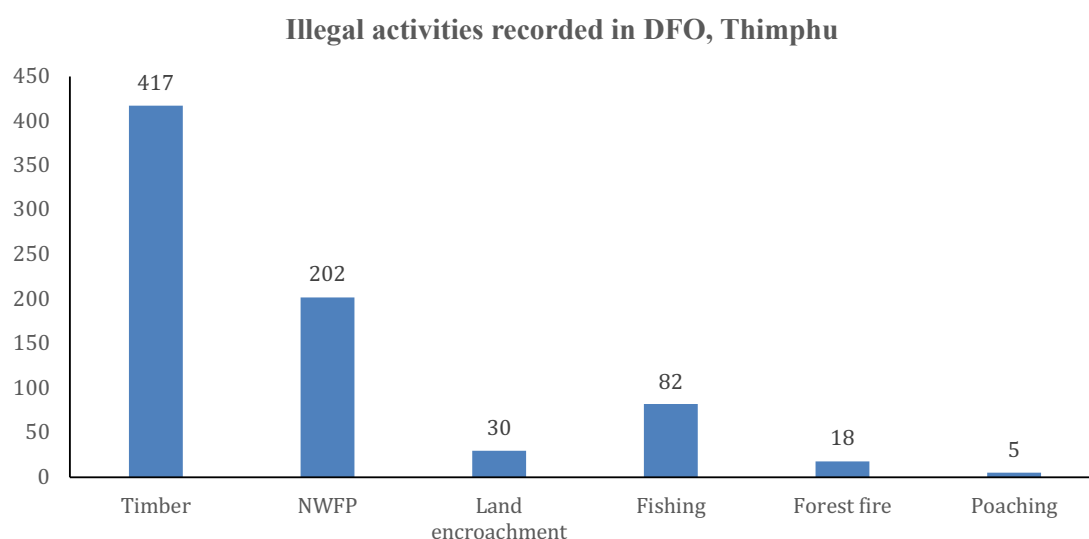


Figure 50: Illegal activities recorded from 2019 to 2024 (source: FIRMS, 2019–2024)

Since 2019, illegal timber harvesting has been the most prevalent offense, with 417 recorded cases, followed by the illegal harvesting of non-wood forest products (NWFPs), which accounted for 202 cases. In contrast, wildlife poaching has been the least reported, with only five cases documented during the same period.

Addressing these challenges requires a comprehensive and multi-faceted strategy aimed at mitigating illegal activities within the forestry sector. Strengthening advocacy and raising awareness on the Forest and Nature Conservation Act and its associated Rules are essential steps toward reducing such offenses. In addition, improved monitoring through the deployment of advanced equipment and enhanced mobility services is crucial. The establishment of strategic check gates and checkpoints will further reinforce enforcement measures and help curb the occurrence of illegal activities within the division.

3.1.3 Climate change and drying of water sources

The in. Climate change stands as one of the most pressing threats to forest ecosystems, biodiversity and human well-being. Rising global temperatures, largely driven by greenhouse gas emissions from human activities such as fossil fuel combustion, deforestation, industrialization and forest fires have intensified extreme weather events.

Within the Thimphu Division, climate change has been manifested through multiple challenges including pest and disease outbreaks (notably bark beetle infestation), tree dieback particularly blue pine, depletion of water sources, windstorms, droughts, proliferation of invasive species, reduced agricultural productivity, shifting tree line and habitat degradation.

Addressing these impacts calls for robust mitigation measures including climate change education and capacity building, adoption of climate-resilient practices (e.g., agroforestry and cultivation of pest- and disease-resistant crops), promotion of green energy, support for research and implementation of afforestation and reforestation initiatives.

Thimphu Dzongkhag is particularly affected by the depletion of water sources, a situation worsened by climate change and growing conflicts over limited water resources. Key drivers of this depletion include developmental activities, illegal logging and disturbances in watershed areas. Drinking water and irrigation have become recurring concerns in meetings and public forums. Presently, the Dzongkhag has 145 identified water sources, of which 54 are showing signs of drying. While none have completely dried, 37% are experiencing alarming rates of depletion posing a critical risk of eventual total loss (Kuensel, April 2023).

Table 31: Status of water sources (Kuensel dated 6th April 2023)

	Status of water source in Thimphu Dzongkhag		
	Total	Drying	Dried up
Dzongkhag			
Thimphu	145	54	0

Key strategies to address the depletion of water sources include conducting comprehensive mapping and restoration of existing sources, safeguarding and protecting critical water catchments, maintaining a detailed water source inventory, and enhancing irrigation systems for efficient water use. Additional measures involve implementing rainwater harvesting practices, institutionalizing Payment for Ecosystem Services (PES) schemes, promoting reforestation and watershed management initiatives, and raising community awareness on water conservation and scarcity issues.

3.1.4 Forest pest and diseases

Forest pests and diseases pose a significant threat to sustainable forest management. The division being largely dominated by blue pine and spruce forests, is particularly vulnerable to severe bark beetle infestations including widespread blue pine dieback on drier slopes. One of the most severely affected areas is Changgidaphu, where bark beetle outbreaks began as early as 2014 causing extensive forest damage. Between 2024 and 2025 alone, sanitation operations to curb further spreading of bark beetle in Changgidaphu resulted in the removal of approximately 146,000 cft of timber in log form creating permanent forest canopy opening.

Beyond the persistent bark beetle infestation in Changgidaphu, other heavily affected sites include Dorjipangkha and Zhubu under Kawang Gewog. Sporadic outbreaks continue to emerge heightening the division's vulnerability to environmental risks such as flash floods triggered by increased surface run-off and landslides. Additionally, blue pine dieback, coupled with damage from forest fires has significantly accelerated deforestation and forest degradation, leading to the creation of barren land as high as 1,395.90 hectares as of March 2025. This growing threat underscores the urgent need for robust and timely conservation interventions.



Figure 51: Bark beetle infestation site at Changgidaphu

Table 32: Record of bark beetle and dieback sites between 2022 and 2024

Location	Year	Gewog	Area in Ha	Standing volume in m3	Remarks
Dorjipangkha	2022	Kawang	1.67		Spruce
Rigchokthangka	2023	Chang	18.13		Spruce
Changgidhaphu	2023	Chang	45.17		Spruce
Helela	2023	Dagala	4.82		Spruce
Zhubu	2023	Kawang	7.06		Spruce
Phuntshothang	2023	Geney		466.181 m3	Spruce
Dorjipangkha	2023	Kawang	3.08		Spruce
Changgidaphu	2023	Chang	33.03		Spruce
Kapakha	2023	Geney		124.955 m3	Spruce
Richuthangka	2024	Chang	18.2		Spruce
Dramisa	2024	Mewang		28.431 m3	Blue pine
Jamiphu	2024	Mewang		99.72 m3	Spruce
Woluna	2024	Mewang		316.30 m3	Blue pine
Danglo	2024	Mewang	37.23	164.073 m3	Blue pine
Namseling (Ramtok-tok)	2024	Chang/Me-wang	68.80	92.177 m3	Blue pine
Namseling (Jamiphu)	2024	Mewang	2.31	26.406 m3	Blue pine
	108.34				

3.1.5 Mining & Logging

Mining and logging pose considerable challenges to sustainable forest management especially as socio-economic development intensifies. Mining activities are concentrated primarily in southern part of the division with nine active mining sites covering approximately 411 acres spread across Bjemina, Khariphu and Namselling. These mining sites contribute to habitat fragmentation, soil erosion and biodiversity loss which directly impact forest ecosystem. Unregulated logging also contributes to forest degradation.



Figure 52: Mining sites under the division

3.1.6 Developmental activities

DFO Thimphu receives numerous economic development proposals ranging from land lease, road construction, transmission lines, substations, communication towers, archery range and recreational areas. These pressure from economic development poses severe threat to conservation of forest area and its resources. For instance, between a period of 2022 to 2024 a total of 211,497 acres of state reserved forest land has been allotted for different developmental activities. Similarly, a total of 73,210m lengths of new road were constructed besides the already existing road network.

While threat arising from economic priorities cannot be controlled totally, the division can play pivotal role to regulate haphazard implementation of project activities through monitoring of terms and conditions laid out in the Forestry Clearances. One approach to mitigate adverse impact of developmental activities is the enforcement of law and making best use of available data including updated cadastral maps.

3.1.7 Muck dumping into SRFL

With the rapid urbanization and developmental activities taking place both within and at the outskirts of Thimphu City including semi-urban areas, increasing number of structures are built generating huge quantity of construction waste and excavated soil materials. These excavated materials and construction waste coming out from various construction sites are eventually dumped either along stream course or road impacting not only forest cover but also water bodies.

As reported from the concerned field offices, Mewang gewog currently faces the highest threat from muck dumping. This threat is expected to increase and impact both forest and water bodies in other gewogs due to similar coverage of road network.

To address this threat, it is necessary to strengthen the advocacy program and carry out proper verification of muck dumping sites based on FNCRR 2023 with special emphasis on Section 46 (1-6) of FNCA 2023.

3.1.8 Land encroachment

Although not really rampant, land encroachment is one threat challenging conservation efforts. The encroachment usually take place through construction of temporary shelters, tshamkhangs, archery range and parking lots. One prominent encroachment practice is state land being separated as a result of road construction, leaving aside fragmented or trapped state reserved forest land.

3.1.9 Invasive species

Invasive species are increasingly spreading due to various factors, including climate-related changes, expanding road networks and agricultural practices. Globally, they are recognized as major drivers of native biodiversity loss. These species disrupt ecological balance and create socioeconomic challenges by reducing agricultural productivity, restricting grazing areas, and lowering livestock yields in high-altitude regions.

Although the overall threat level in Thimphu Dzongkhag is considered low, the SES & CVCA survey conducted in 2023 revealed a notable increase in invasive species, particularly in agricultural zones. The impact varies across Bhutan's diverse ecosystems. For instance, alpine and temperate rangelands are undergoing significant changes due to shrub encroachment by species such as *Rhododendron* and *Juniper*. A study by Dorji et al. (2024) reported that the dominance of shrub species in the summer rangelands of Dagala in western Bhutan, has led to a substantial decline in plant species richness.

Common invasive species include *Potentilla peduncularis*, *Rumex* species, *Oxalis latifolia*, and *Alternanthera pungens* (Khaki Weed). Addressing this issue calls for well-planned strategies to manage invasive weeds effectively, particularly within state reserved forest lands.

3.2 Threat Ranking

The identified threats were ranked using the Miradi Software (version 4.6) which is designed for conservation project planning and management. The threat ranking exercise was done based on their impacts on conservation efforts of the division, taking account of three scorings criteria viz Scope, Severity and Irreversibility. The objective 1 of the division is impacted by delayed service delivery and weak enforcement whereby this threat or challenge needs special attention. Similarly, the objective 2 and 5 have high level of threat mainly contributed by forest fire, forest pest and diseases, increasing demand on forest resources and developmental activities.

While six threats/challenges (HWC, Mining and Logging, Waste Management, Muck Dumping, Land Encroachment and Invasive Species) are ranked LOW, the threats like (Forest Fire, Illegal Activities, Climate Change and Drying Water Sources, Increased Demand on Forest Produce, Forest Pests and Diseases (tree die-back), Delayed Services and Weak Enforcement, Developmental Activities) appeared MEDIUM, whereby the overall conservation threat level has emerged to be HIGH (table 33).

Table 33: Threat ranking of the division using Miradi 4.6.0 version

Threats \ Targets	To enhance effective service ...	To ensure sustainable m...	To ensure biological integ...	To enhance sustainable f...	To combat the adverse impact...	Summary Threat Rating
Human Wildlife Conflict			Low		Low	Low
Illegal Activities	Low	Medium	Medium	Low	Medium	Medium
Climate change and drying water source		Medium	Medium	Low	Medium	Medium
Increasing demand on forest produce		Medium	Medium		Medium	Medium
Forest Pest and Disease (Tree Die-back)		Medium	Medium	Medium	Medium	Medium
Invasive Species			Low			Low
Mining and Logging		Low	Medium		Low	Low
Waste dumping into SRFL			Low		Low	Low
Forest Fire		Medium	Medium	Medium	Medium	Medium
Developmental Activities		Medium	Medium		Medium	Medium
Muck Dumping into SRFL		Low	Low			Low
Land Encroachment		Low			Low	Low
Delayed Service Delivery and Weak	High					Medium
Summary Target Ratings:	Medium	Medium	Medium	Medium	Medium	Overall Project Rating High

3.3 Challenges

3.3.1 Human-wildlife conflict

Human wildlife conflict (HWC) is one of the conservation challenges impacting division's resources. The frequency of conflict particularly in terms of crop and livestock depredation has become increasingly more and widespread besides the need to attend numerous wildlife rescue and rehabilitation cases. It is perceived that this threat/challenge is a result of factors such as fragmentation of habitat, decreasing prey base for predators, expansion of developmental activities including agriculture and livestock farming, improper waste management, wildlife feeding amongst other.

Result from Socio-Economic Survey conducted in 2023 (SES 2023) which interviewed 394 households revealed a total of 178 and 33 crop and livestock depredation cases respectively between 2021 to 2023. The survey also found 10 cases of property damage (refer figure 41)

However, these figures are purely based on social interview which could cover only 20% of the households under the division. To compile a more comprehensive information on HWC and its scenario, data from FIRMS and SMART were used as well. It is understood that the number of incidences increased where Mewang Gewog alone experienced 136 cases of crop depredation. Similarly, Dagala Gewog which is primarily dependent on livestock farming experienced a total of 51 livestock depredation cases thereby ranking these two gewogs as the two most significant gewogs in terms of HWC. These two gewogs also experienced conflict in terms of property damage recording 6 cases in Mewang and 1 case in Dagala.

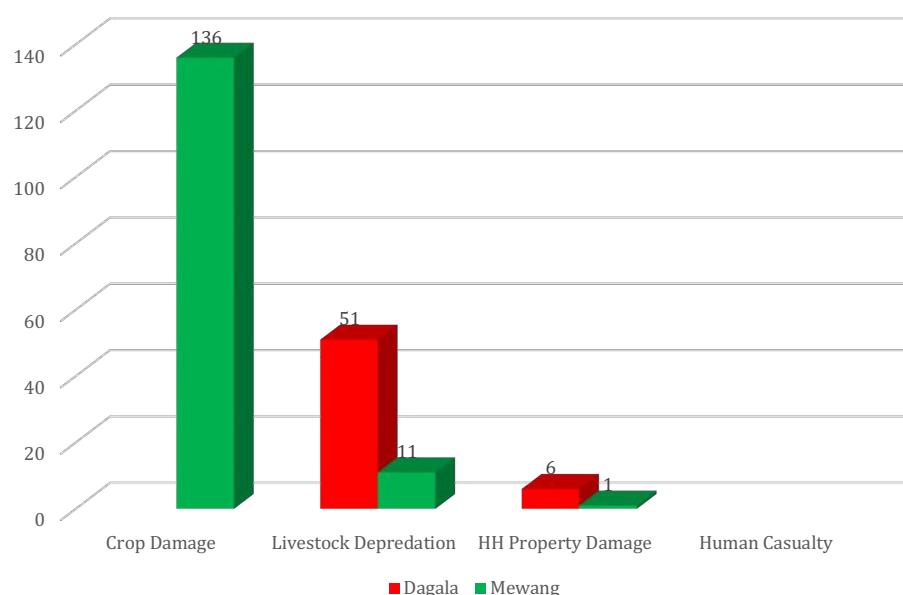


Figure 53: HWC cases recorded in the two most conflict prone gewogs

3.3.2 Increasing Demand on Forest Produce

The escalating demand for forest products has emerged as a major challenge to the sustainability of forest ecosystems. Driven by population growth and intensified economic activities, the need for timber, fuelwood, medicinal plants, and other non-wood forest products continues to rise. Contributing factors such as, infrastructure development, agricultural expansion and poverty or dependence on forests for livelihoods further exacerbate this pressure.

As Thimphu evolves into a central hub for trade, industrialization with rapid rural-urban migration, the strain on natural resources tend to intensify across multiple sectors. This mounting pressure eventually heightens the risk of deforestation and forest degradation. One of the concerns is the growing demand for timber, especially for flagpoles, firewood and funeral pyre wood associated with cultural practices which coupled with rapid population growth, poses a significant threat to the sustainability of forest resources.

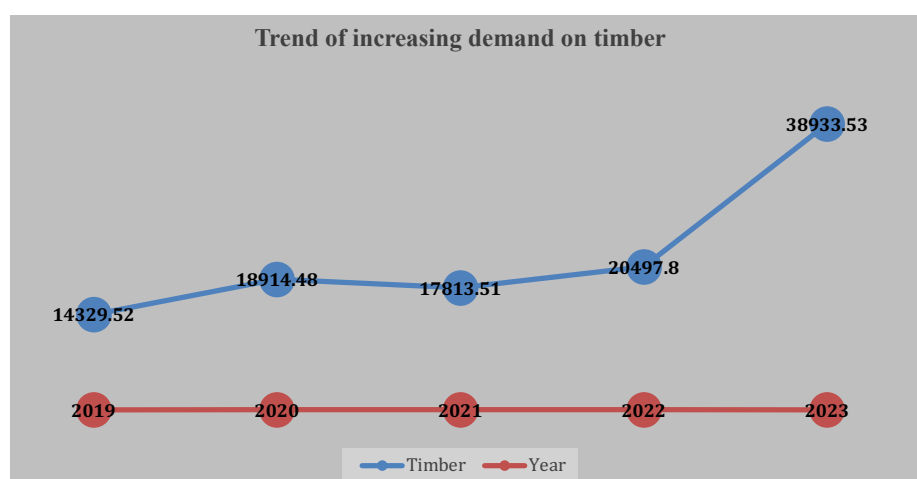


Figure 54: Demand on forest produce (FIRMS 2019 -2023)

Mitigation measures should prioritize the adoption of innovative technologies including the use of modern construction material. Strengthening awareness and advocacy programs aimed at bringing positive changes in cultural beliefs and social stigma, exploring sustainable alternatives may help reduce pressure on forest resources. Furthermore, initiatives to promote community and institutional participation in various sustainable forest management actions may help to cope up with growing demand in long run.

3.3.3 Delayed Service Delivery & Weak Enforcement

The Thimphu Forest Division serves a critical role in catering forestry services to both rural and urban population. Due to Thimphu's rapid growth with numerous developmental activities spread across both core and far flung areas, the division has expanded its activities to address a broad range of public needs, including issuing Forest Clearances (FC) for development projects, marking and authorizing timber harvesting for sustainable resource use and offering digital services through platforms like G2C (Government to Citizen) and OFS (Online Forest Services) to streamline applications and approval processes.

Despite its robust guidelines, policies and plans the division faces significant challenges in delivering forestry services due to various operational constraints. These include a shortage of skilled staff, technical capacity, inadequate equipment, unreliable internet connectivity, mobility and poor road networks in rural areas. These factors combined with unscheduled tasks outside the core mandates often lead to delays in providing timely services.

3.3.4 Waste Dumping in SRFL

Waste management has become an increasingly critical challenge in rapidly growing urban places like Thimphu, driven by rising population and higher consumption patterns. Improper disposal practices, including littering and indiscriminate dumping of construction waste, often result in waste accumulation along river/stream course and roadsides. This not only pollutes the environment but also poses serious health hazards including human wildlife conflicts.

Effective waste management calls for a shift towards a more sustainable and resource-conscious approach, prioritizing waste reduction, proper segregation, recycling, and safe disposal. Public awareness and behavioral change play a vital role, encouraging individuals and communities to reuse and recycle materials to the extent possible.

Furthermore, integrating innovative waste utilization practices within relevant sectors may make a substantial difference. Adopting responsible and circular waste management strategies, may significantly reduce pollution which ultimately goes into state reserved forest land including water bodies.

Subsequent to the threat ranking exercise and understanding the objectives being impacted by each of the threats and challenges, strategies were also framed for each objective whereby a conceptual model was generated using the same Miradi Software (version 4.6). This conceptual model (figure 55) is used to identify appropriate actions to eventually achieve the five objectives and address the threats and challenges over the next ten years beginning 2026.

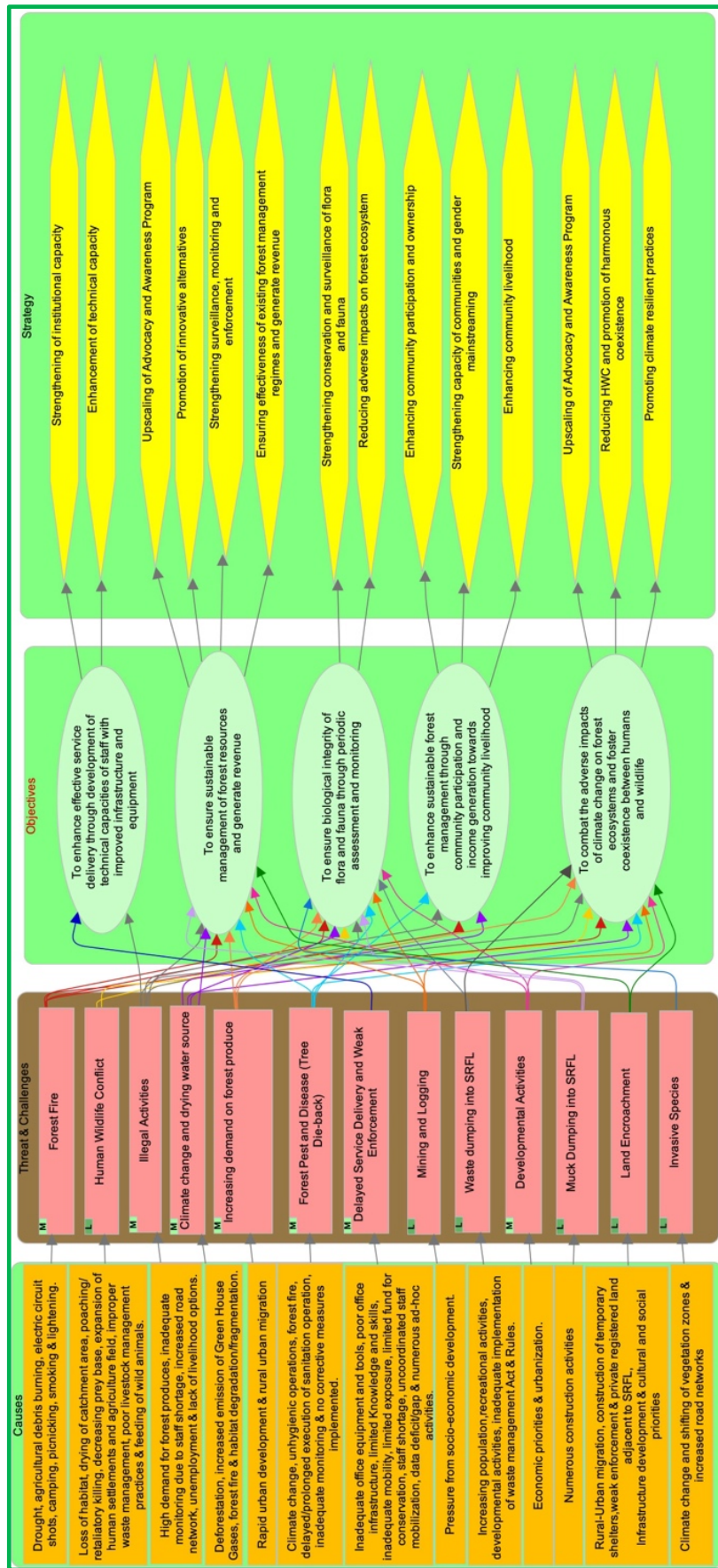


Figure 55: The conceptual model on threats, objectives and strategies of DFO Thimphu.

Chapter 4: Management prescription

4.1 General Management Prescription

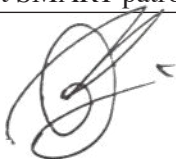
To achieve the five broad management objectives, fourteen strategies have been identified, against which a total of sixty-seven actions are identified as tabulated under table 34.

Table 34: Management Prescriptions (General)

Objective 1: To enhance effective service delivery through development of technical capacities of staff with improved infrastructure and equipment
Strategy 1.1 Enhancement of institutional capacity
Activity 1.1.1 Construct DFO Office
Activity 1.1.2 Construct Forest Beat Offices (Geneykha)
Activity 1.1.3 Renovate Forest Beat Offices (Hongtsho & Dechencholing)
Activity 1.1.4 Renovate Gidakom and Changang-Helela FMU Offices
Activity 1.1.5 Construct Forest Range Office, Khasadrapchu
Activity 1.1.6 Renovate Thimphu Range Office
Activity 1.1.7 Procure office furniture
Activity 1.1.8 Procure office equipment (computer and peripherals)
Activity 1.1.9 Provide high-speed internet connection in all field offices
Activity 1.1.10 Improve communication facilities (handsets, repeater stations, telephone)
Activity 1.1.11 Enhance mobility services
Activity 1.1.12 Procure Forest fire fighting tools (water bags, field gears)
Activity 1.1.13 Maintain multipurpose trail around Thimphu
Strategy 1.2 Enhancement of technical capacity
Activity 1.2.1 Conduct awareness program on FNCA, FNCRR & Guidelines, Forest Fire, waste management, G2C, OFS
Activity 1.2.2 Provide in-house trainings on specialized forest and wildlife management
Activity 1.2.3 Facilitate wood-based Industries on minimizing wood wastage, value addition, product diversification and hazard reduction
Activity 1.2.4 Enhance exposure, knowledge and technical capacity on best conservation practices
Objective 2: To ensure sustainable management of forest resources and generate revenue
Strategy 2.1 Upscaling of Advocacy and Awareness Program
Activity 2.1.1 Conduct awareness program on FNCA, FNCRR & Guidelines, Forest Fire, waste management, G2C, OFS
Strategy 2.2 Promotion of innovative alternatives
Activity 2.2.1 Facilitate construction of flag hoisting structures at strategic locations



Activity 2.2.2 Initiate construction of flag hoisting structures in CFs & NWFP Management Groups
Activity 2.2.3 Identify and map potential area to meet pyre wood demand (Juniper)
Strategy 2.3 Strengthening surveillance, monitoring and enforcement
Activity 2.3.1 Map hotspots for illegal forest activities (Timber and NWFPs)
Activity 2.3.2 Conduct periodic and long-range patrolling using SMART Tool
Activity 2.3.3 Implement Forest fire surveillance and suppression
Strategy 2.4 Ensuring effectiveness of existing forest management regimes and generate revenue
Activity 2.4.1 Prepare Operational Plans for FMUs
Activity 2.4.2 Revise FMU Plans
Activity 2.4.3 Prepare LFMA plans (Dagala, Kawang and Mewang)
Activity 2.4.4 Revise LFMA plans (Chang and Geney)
Activity 2.4.5 Prepare Scientific Thinning Action Plan
Activity 2.4.6 Revise community forest management plans (21 CFs)
Activity 2.4.7 Revise NWFP management plans (2 plans)
Activity 2.4.8 Deliver various forestry services
Activity 2.4.9 Provide feed and fodder for management of wildlife at the Royal Takin Preserve, Motithang
Activity 2.4.10 Maintain Forest Nurseries at Samazingkha
Activity 2.4.11 Facilitate export of timber and NWFPs
Objective 3: To ensure biological integrity of flora and fauna through periodic assessment and monitoring
Strategy 3.1 Strengthening conservation and surveillance of flora and fauna
Activity 3.1.1 Carry out tiger population survey as a part of the nationwide tiger population revalidation surveys every five years
Activity 3.1.2: Determine the population or abundance Musk Deer as a part of the nationwide survey
Activity 3.1.3: Conduct eDNA survey as a part of nationwide survey
Activity 3.1.4: Determine the population of snow leopard and its prey as a part of the Nation-wide Snow Leopard Survey using structured, grid-based camera trap surveys
Activity 3.1.5: Conduct Takin Survey as a part of the nation-wide survey to determine the population estimate of Bhutan Takin
Activity 3.1.6: Conduct National Forest Inventory
Activity 3.1.7: Assist to conduct Bhutan METT+ Assessment (Mid Term)
Activity 3.1.8: Assist to conduct Bhutan METT+ Assessment (Final Assessment)
Activity 3.1.9: Conduct periodic (annual monitoring) of all forest management regimes including plantations
Activity 3.1.10: Assist to conduct mid-term and final evaluation of all forest management regimes including plantations
Activity 3.1.11: Conduct compliance monitoring of the terms and conditions of the Forestry Clearances
Activity 3.1.12: Monitor the biodiversity monitoring grids
Activity 3.1.13: Conduct SMART patrol and forest surveillance using Drone



Strategy 3.2 Reducing adverse impacts on forest ecosystem
Activity 3.2.1: Conduct timely detection of forest pest and disease for remedial actions
Activity 3.2.2: Monitor sanitation operations executed by authorized agencies
Activity 3.2.3: Prepare Forest fire hotspot maps and develop fire suppression action plan
Activity 3.2.4: Strengthen IFFCG through periodic meetings and review of SoP
Activity 3.2.5: Establish Community Based Forest Fire Management Groups (Gewog/Chi-wog Level)
Objective 4: To enhance sustainable forest management through community participation and income generation towards improving community livelihood
Strategy 4.1 Enhancing community participation and ownership
Activity 4.1.1 Facilitate to set up CF and NWFP Administration (23 offices)
Strategy 4.2 Strengthening capacity of communities and gender mainstreaming
Activity 4.2.1 Capacity building of CFMGs on record keeping, silviculture system, networking, exchange programs, value addition and product diversification
Activity 4.2.2 Provide technical backstopping to CF members on plantation and nursery techniques
Activity 4.2.3 Enhance value addition and processing of finished products from surplus timber/sanitation timber
Strategy 4.3 Enhancing community livelihood
Activity 4.3.1 Facilitate community-based ecotourism services (birding trail, nature trek with basic amenities)
Activity 4.3.2 Facilitate price negotiation meetings between potential buyers and NWFP Groups
Activity 4.3.3 Facilitate establishment of private/community owned nurseries
Objective 5: To combat the adverse impacts of climate change on forest ecosystems and foster coexistence between humans and wildlife
Strategy 5.1 Upscaling of advocacy and awareness program
Activity 5.1.1 Conduct advocacy on wildlife crime prevention and legal proceedings
Activity 5.1.2 Conduct awareness on Human Wildlife Conflict (HWC) mitigation
Strategy 5.2 Reducing HWC and promotion of harmonious coexistence
Activity 5.2.1 Reduce crop damage and livestock depredation by facilitating solar fencing/chain link fencing
Activity 5.2.2 Restore habitat through maintenance of existing water holes
Activity 5.2.3 Facilitate habitat enrichment through execution of enrichment plantation
Activity 5.2.4 Equip rescue teams with essential field equipment (dart gun, cage drug)
Activity 5.2.5 Conduct effectiveness assessment of HWC interventions in two hot spot gewogs (Mewang and Dagala)
Activity 5.2.6 Conduct wildlife rescue and rehabilitation
Strategy 5.3 Promoting climate resilient practices
Activity 5.3.1 Implement integrated landscape management (agroforestry)
Activity 5.3.2 Implement nature-based solutions to restore degraded and barren area



4.2 Management prescription for High Conservation Value Area (HCVA)

Management Prescriptions for High Conservation Value Area (Dagala Water Catchment Area) is determined from the screening result where it revealed to be Priority 1 HCV with High Probability and High Threat thereby demanding active response as outlined in table 35.

Table 35: Framework of HCV Probability and Threat

Table 29: Framework of HCV Probability and Threat	Table 29: Framework of HCV Probability and Threat	
	Table 29: Framework of HCV Probability and Threat	Higher Probability
Table 29: Framework of HCV Probability and Threat	Table 29: Framework of HCV Probability and Threat	Priority 1 (High HCV Probability & High Threat) Active Response
Table 29: Framework of HCV Probability and Threat	Table 29: Framework of HCV Probability and Threat	Priority 2 (High HCV Probability & Low Threat) Preventative Response

The area therefore warrants the highest level of management response to maintain and enhance the existing values. This is because there is a high likelihood of HCV being present but it faces a higher level of threat that can impact its existence in the landscape. So active response towards reducing threats is as outlined in table 36.

Table 36: Management prescriptions specific to HCVA (Dagala Water Catchment Area)

Strategy	Outcome	Output	Activities
Identification of active responses towards addressing both existing and emerging threats	Forest Ecosystem including water quantity and quality maintained	Payment for Environmental Services (PES) initiated	• Periodic monitoring of water quality and quantity
			• Mapping of water recharge zone within the HCVA
			• Mapping of lakes within the HCVA
			• Facilitate tsamdro management plan development for the plots falling within the HCVA
			• Support/facilitate upscaling of solar/coral fencing
			• Support maintenance of trial stretch falling within HCVA
			• Enhance capacity of executive members on NWFP administration and governance

			• Assist Jhomdaga Ngomen Tshogpa in marketing of NWFPs beyond existing market
			• Prescribed burning to improve range land quality
			• Conservation and legal Awareness to the communities including Local Government Leaders
			• Conduct SAMRT Patrol
			• Formation of Forest Fire Management Group at Gewog/Chiwog Level
			• Procurement of forest fire-fighting equipment
			• Conduct periodic assessment of forest pest and disease outbreaks
			• Execute timely sanitation operation
			• Conduct PES initiation consultation workshop/meeting
			• Prepare PES Management Plan
			• Develop Annual Operational/Action Plan

4.3 Gender Mainstreaming

The Divisional Forest Office (DFO) Management Plan has been meticulously developed to ensure that gender considerations are integrated into all aspects of sustainable forest management. Recognizing the diverse roles and contributions of women, men, and youth in forestry and conservation, the plan is designed to be gender-responsive from inception through implementation and evaluation.

In crafting this DFO Management Plan, special emphasis has been placed on identifying and addressing the unique needs, challenges, contributions and priorities of all genders. This ensures that everyone, regardless of gender, has equitable access to opportunities, resources and benefits. The plan emphasizes equal representation, rights, influence, leadership opportunities and the sharing of benefits across all demographic groups, fostering a more inclusive and balanced approach to forest management.

To achieve these goals, the planning process actively promotes the involvement of both women and men in stakeholder consultations and decision-making forums. This participatory approach ensures that diverse perspectives are considered, enhancing the overall effectiveness and sustainability of forest management practices. Women and youth, in particular, are provided platforms to voice their opinions, share their insights, and contribute to shaping strategies that directly affect their communities and livelihoods.

The gender mainstreaming efforts embedded in the DFO Management Plan are guided by the Department's comprehensive Gender Mainstreaming Policy. This policy serves as a framework to ensure that gender equality is not only a guiding principle but also a measurable outcome in forest management initiatives. Through targeted actions, such



as capacity-building programs, inclusive leadership development, and equitable benefit-sharing mechanisms, the plan seeks to dismantle systemic barriers and empower all individuals to contribute meaningfully to sustainable forestry.

Ultimately, the DFO Management Plan underscores the critical importance of gender inclusivity in achieving the broader goals of sustainable forest management. By fostering a gender-responsive approach, the plan aims to build resilient forest ecosystems and thriving communities where every individual, regardless of gender can play an active and equitable role in shaping the future of Bhutan's forests landscape.

Table 37: Areas to consider Gender mainstreaming

Actions	Considerations
Consultation meetings	Both men and women including youth representation during consultation meeting for development of any management regimes in future such as LFMP, CF, NWFP, Scientific Thinning shall have equal representation to the extent possible
Conservation awareness programs related to Sustainable Forest Management and Biodiversity Conservation	Need to consider equal representation as both male and female including youth have different level of understanding, priorities and information dissemination
Human Resource Development	Trainings and workshops need to consider gender representation for staff and stakeholders
Executive Members of Conservation Management Plans	Appointment of executive members of CF and NWFP need to consider equal representation of both genders as major decisions are influenced by these group of people

4.4 Environmental and Social Safeguards

Over the next ten years of the plan period, Environmental and Social Safeguards (ESS) will be a cornerstone in implementation of management interventions. The safeguards are integral part of DFO management plan to ensure that all activities align with sustainable development principles to minimize potential negative impacts on the environment and local communities.

ESS screening will be systematically conducted for all planned interventions to identify activities that could result in adverse environmental or social effects. Through this process, the plan will pinpoint potential risks and design comprehensive strategies to minimize negative impacts effectively. These strategies will prioritize proactive measures, emphasizing prevention wherever feasible, alongside adaptive solutions to address unforeseen challenges.

The ESS framework will guide the entire lifecycle of the management plan, from initial planning through implementation and monitoring. It will ensure that all prescribed interventions adhere to the Department of Forests and Park Services (DoFPS) guidelines, providing a robust structure for oversight and accountability. This framework will not only facilitate compliance with national and international standards but also fosters a culture of responsible forest management.



To enhance the efficacy of these safeguards, continuous monitoring and evaluation mechanisms will be established. These systems will track the implementation and performance of mitigation measures, ensuring that they deliver the intended outcomes. Any emerging issues during the execution of management interventions will be promptly identified and addressed through corrective actions, thereby maintaining the integrity of the plan's objectives.

Moreover, the integration of ESS considerations into the planning and implementation phases underscores a commitment to inclusivity and sustainability. Special attention will be given to engaging local communities and stakeholders, recognizing their vital role in forest conservation and management. By incorporating their knowledge, perspectives, and needs, the plan aims to achieve balanced outcomes that benefit both ecosystems and people.

So, Environmental and Social Safeguards embedded in the DFO Management Plan will play a pivotal role in guiding sustainable forest management practices over the next decade. By proactively addressing potential risks and fostering a collaborative approach, the plan seeks to ensure the long-term forest health while enhancing the well-being of the communities that depend on forest ecosystem.

Table 38: Environmental and social safeguards (ESS)

Actions	Considerations
Forest Function Mapping	Proper execution of forest function mapping for any new management regimes in future following the guidelines and Forest Management Code of best management practices will certainly take care of issues related to environment
Issuance of Forestry Clearances	Seeking Forestry Clearances for any developmental activities on State Reserved Forest Land will address unintended environmental impacts
Consultation Meetings	Development of new management plans or revision of any of the existing management regimes shall take place with due endorsement from local communities lead by local government to avoid both environmental and social impacts
Awareness Programs	Awareness to local communities in terms of amendments made to the FNCA and FNCRR shall be given due consideration as and when such programs are organized
Occupational Health and Safety (OHP)	Occupational Health and Safety needs to be considered while executing actions such as installation of solar coral fencing, chain-link fencing, implementation of sanitation operations, installation of permanent flag hoisting structures, restoration of barren and degraded areas through reforestation program



Chapter 5:

Implementation plan and financial outlay

The current plan marks the first-ever DFO management plan and is closely aligned with sustainable development, improved service delivery, livelihood enhancement and conservation priorities, similar to the Protected Area (PA) conservation management plans. To successfully implement the proposed programs over the next decade and realize the stated goals and objectives, a secure and sustainable funding mechanism has to be explored.

A major financial support is expected from the WWF Bhutan Program through Phase II of the IKI Living Landscape Project to ensure financial support beyond 2028 besides support from the Royal Government of Bhutan (RGoB).

However, to ensure comprehensive coverage, the management may also explore funding support from other conservation partners such as Bhutan Trust Fund for Environmental Conservation (BTF-EC), Asian Forest Cooperation Organization (AFoCO), Reducing Emissions from Deforestation and Forest Degradation (REDD+), UNDP-Global Environment Facility (UNDP-GEF), Helvetas-Bhutan, Bhutan Foundation, and the Royal Society for the Protection of Nature (RSPN). These resources will be vital to support activities which are either excluded or inadequately funded under the current IKI Living Landscape Project. Strengthening collaboration and fostering partnerships with both national and international donors will be critical for successful implementation of this plan.

The 10-year management plan (2026–2035) for Thimphu DFO is projected to require a total of Nu. 243.81 million with additional Nu. 2.90 million earmarked for HCVA programs. The majority of this funding is anticipated from WWF Bhutan Program and the RGoB. In case of any potential funding gaps, additional resources have to be sourced from other conservation partners.

5.1 Implementation Framework

The management prescriptions of the plan are outlined in this chapter within the implementation framework (Table 39) for a 10-year period (2026–2035). A realistic, year-wise budget has been allocated to each activity, based on the prescribed management interventions for the entire plan period. However, with the emergence of new issues and threats, as well as the need to mitigate or address existing and anticipated challenges, program/activities may require realignment if necessary.



Table 39: Implementation plan and financial outlay (General)

Objective	Strategy	Action	Year with budget outlay (Nu. in Million)										Remarks	
			2026 I	2027 II	2028 III	2029 IV	2030 V	2031 VI	2032 VII	2033 VIII	2034 IX	2035 X		
1. To enhance effective service delivery through development of technical capacities of staff with improved infrastructure and equipment	1.1: Enhancement of institutional capacity	1.1.1: Construct DFO Office				20.00							Serbithang	
		1.1.2: Construct Forest Beat Offices						10.00					Geneykha	
		1.1.3: Renovate Forest Beat Offices		0.80	0.40								Hongtsho and Dechencholing Beat Offices	
		1.1.4: Renovate FMU Offices		1.00									Gidakom and Chamgang-Helela	
		1.1.5: Construct Forest Range Office			12.00								Khasadrapchu Range Office	
		1.1.6: Renovate Thimphu Range Office			0.20								Lanjophakha	
		1.1.7: Procure office furniture					1.50						Replacement of old furniture in 9 field offices	
		1.1.8: Procure office equipment (computer and peripherals)	0.50										Procurement	
		1.1.9: Provide high-speed internet connection in beat offices	1.00										Dechencholing	
		1.1.10: Improve communication facilities (handsets, repeater stations, telephone)	0.50				0.50						Procurement of repeater set and 5 Nos of handsets	



		1.1.11: Enhance mobility services (Procurement, fuel and maintenance)	4.50	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	Replacement of pool vehicle, Fuel & maintenance of three pool vehicle
		1.1.12: Procure Forest fire fighting tools (water bags, field gears)	0.40											0.40	Procurement
		1.1.13: Maintain multipurpose trail around Thimphu	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	Maintenance of trail, wooden bridges
	1.2: Enhancement of technical capacity	1.2.1: Provide in-house trainings on emerging forest management tools and equipment	0.10	0.10						0.10	0.10			0.10	Drone operations, GIS applications & SMART, Densitometer)
		1.2.2: Provide in-house trainings on specialised forest and wildlife management		0.20						0.10	0.10			0.10	wildlife rescue operations, survey methodologies and data analysis, field botanization, monitoring and evaluation of forest management regimes, camera traps
		1.2.3: Facilitate wood-based Industries on minimizing wood wastage, value addition, product diversification and hazard reduction		0.05						0.05				0.05	Consultation meetings

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		2.4.9: Provide feed and fodder for management of wildlife at the Royal Takin Preserve, Motithang	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	Procurement of animal feeds and collection of fodder
		2.4.10: Maintain Forest Nurseries at Samazingkha	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
		2.4.11: Facilitate export of timber and NWFPs	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	For stock verification at the timber landing sites
3. To ensure biological integrity of flora and fauna through periodic assessment and monitoring	3.1: Strengthening conservation and surveillance of flora and fauna	3.1.1: Carry out tiger population survey as a part of the nationwide tiger population revaluation survey		1.25										1.45		
		3.1.2: Determine the population or abundance Musk Deer as a part of the nationwide survey	0.365													
		3.1.3: Conduct eDNA survey as a part of nationwide survey	0.225													
		3.1.4: Determine the population of snow leopard and its prey as a part of the Nation-wide Snow Leopard Survey using structured, grid-based camera trap surveys													2.50	
															2.50	



[illegible]

3.2: Reducing adverse impacts on forest ecosystem	3.1.11: Conduct compliance monitoring of the terms and conditions of the Forestry Clearances	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	Field visit to 20 FCs issued sites in a year
	3.1.12: Monitor the biodiversity monitoring grids	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	Field visit to 6 BMGs per year
	3.1.13: Conduct SMART patrol and forest surveillance using Drone	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	340 patrol/year with drone surveillance twice monthly
	3.2.1: Conduct timely detection of forest pest and disease for remedial actions	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	Timely surveillance of the pest and diseases detection
	3.2.2: Monitor sanitation operations executed by authorized agencies	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	Field visit to monitor execution of sanitation operations
	3.2.3: Prepare Forest fire hotspot maps and develop fire suppression action plan	0.05										
	3.2.4: Strengthen IF-FCG through periodic meetings and review of SoP	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
	3.2.5: Establish Community Based Forest Fire Management Groups (Gewog/Chiwog Level)		0.15									Setting up of 5 Gewog/Community Based Forest Fire Management Groups

4:To enhance sustainable forest management through community participation and income generation towards improving community livelihood	4.1 Enhancing community participation and ownership	4.1.1 Facilitate to set up CF and NWFP Administration	1	2	4	4	4	4	3	1			Simple office to function
	4.2 Strengthening capacity of communities and gender mainstreaming	4.2.1Capacity building of CFMGs on record keeping, silviculture system, networking, exchange programs, value addition and product diversification	0.15	0.15				0.15		0.15		0.15	At least 3 executive members of 21 CFs and 2 NWFP Groups
		4.2.2 Provide technical backstopping to CF members on plantation and nursery techniques		0.04					0.04				
		4.2.3 Enhance value addition and processing of finished products from surplus timber/sanitation timber		0.08						0.08			Potential CFs to take up this activity
	4.3Enhancing community livelihood	4.3.1Facilitate community-based ecotourism services (birding trail, nature trek with basic amenities)		0.09	0.08	0.07							Jela-Boemri (Bjemina exit) or Jela-Dongkala via Boemri (Khariphu exit) or Jela - Jigme Langtsho (Tshaluna exit)



	5.2.4 Equip rescue teams with essential field equipment (dart gun, cage drug)	0.50		0.30		0.30		0.30		0.30		0.30	1 Dart Gun & 1 cage (One time procurement) and drug procurement every alternate year
	5.2.5 Conduct effectiveness assessment of HWC interventions in two hot spot gewogs (Mewang and Dagala)		0.40										Mewang and Dagala by DFO (
	5.2.6 Conduct wildlife rescue and rehabilitation	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
	5.3 Pro-motion of climate resilient practices			1.00									Samazingkha
	5.3.1 Implement integrated landscape management (agroforestry)												
	5.3.2 Implement nature-based solutions to restore degraded and barren area	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	2 hectare per year on already mapped DBA
Yearly Total/Plan Total		24.52	23.40	34.46	38.62	20.96	31.31	22.15	17.20	15.72	15.47	243.81	

5.2 Implementation Plan and Financial Outlay for High Conservation Value Area (HCVA)

Table 40: Implementation plan and financial outlay for HCVA

Strategy	Outcome	Output	Activity	Location	Timeframe	Budget Nu. (Million)
Identification of active responses towards addressing both existing and emerging threats	Forest Ecosystem including water quantity and quality maintained	Payment for Environmental Services (PES) initiated	Periodic monitoring of water quality and quantity (DoW)	Dagala Gewog	July-August 2026	0.05
			Mapping of water recharge zone		September-October 2027	0.20
			Mapping of lakes within HCVA		April-May 2028	0.20
			Facilitate tsamdro management plan development for the plots falling within the HCVA		March-April 2028	0.25
			Support/facilitate upscaling of solar coral fencing		May-June 2028	0.50
			Support maintenance of trail		August- September 2028	0.05
			Support capacity building of NWFP executive members on administration and good governance		July-August 2026	0.03
			Assist Jhomdhaga Ngomen Tshogpa to identify additional market for NWFPs		August-September 2027	0.02
			Support prescribed burning to enhance rangeland quality		March-April 2027	0.20
			Conduct conservation and legal awareness to communities and LG leaders		August-September 2028	0.10
			Conduct SMART Patrol		November-December 2026	0.09
			Initiate formation of forest fire management group at Gewog/Chiwog level		September-October 2027	0.20

			Procurement of forest firefighting equipment		January-February 2027	0.15
			Conduct periodic assessment of forest pest and disease outbreak		Annually	0.15
			Execute timely sanitation operation		Quarterly/Half yearly/Annually	0.08
			Conduct PES initiation consultation workshop/meeting		February-March 2028	0.40
			Prepare/develop PES Management Plan		July-December 2028	0.20
			Develop annual operation plan		January 2029	0.03
Total						2.90



Chapter 6: Monitoring and evaluation

Timely monitoring and evaluation of the planned programs are critical to ensuring the effective delivery of outputs. This chapter outlines the approach for monitoring and evaluating the implementation of the plan. The M&E framework (refer table 41 and 42) has been designed to align with the Implementation Framework and incorporates key indicators against which the Division's performance will be assessed.

6.1 Monitoring

Monitoring is a continuous assessment process that provides stakeholders with timely and detailed updates on the progress or delays of ongoing activities, thereby offering a clear picture of their implementation status. For the 10-year management plan, monitoring will be carried out annually by the DFO, Thimphu management team. This process will be aligned with the annual operational plan to ensure systematic oversight and accountability throughout the implementation period.

6.2 Evaluation

The evaluation of the plan will be conducted twice during the 10-year period. A midterm review will take place in the last quarter of the 4th year, followed by a final review in the last quarter of the 9th year. These evaluations will be carried out by both internal members (DFO Thimphu) and an external committee comprising representatives from the functional divisions of DoFPS.

The Bhutan METT+ assessment will be undertaken at two levels: Internal Assessment and External Assessment. The Internal Assessment, which serves as a self-evaluation, should be conducted prior to the External Assessment by the respective field offices. This team should include the CFO, Section Heads, and at least one officer from the Range Office within their jurisdiction.

The External Assessment will be coordinated by FMID in collaboration with relevant offices to ensure impartiality in evaluating the internal assessment results. The external team will include one Specialist, one representative each from the functional divisions and one representative from the adjoining Division Forest Office.

The first baseline METT+ score for Thimphu DFO was 47.9%. This score was generated to establish baseline data for the IKI project. However, management cannot guarantee a 20% increase in the METT+ score by June 2028, as indicated in the project document.



Table 41: Monitoring Framework for General Management Prescriptions

Objective	Action	Output Indicator	Unit		Year with budget outlay (Nu. in Million)										
					2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
					I	II	III	IV	V	VI	VII	VIII	IX	X	
1. To enhance effective service delivery through development of technical capacities of staff with improved infrastructure and equipment	1.1.1: Construct DFO Office	DFO Office constructed	No.	1				1							
	1.1.2: Construct Forest Beat Offices	Beat Office constructed	No.	1						1					
	1.1.3: Renovate Forest Beat Offices	No. of Beat Offices renovated	No.	2	1	1									
	1.1.4: Renovate FMU Offices	No. of FMU Offices renovated	No.	2	2										
	1.1.5: Construct Forest Range Office	Range Office constructed	No.	1		1									
	1.1.6: Renovate Thimphu Range Office	Range Office renovated	No.	1		1									
	1.1.7: Procure office furniture	Office furniture purchased	No.												
	1.1.8: Procure office equipment (computer and peripherals)	Office equipment procured	No.												

1.2.2: Provide in-house trainings on specialised forest and wildlife management	No. of trainings provided	No.	1		1w	1	1	1	1	1	1
	1.2.3: Facilitate wood-based Industries on minimizing wood wastage, wood wastage, value addition, product diversification and hazard reduction	No.			1	1	1	1	1	1	1
	1.2.4: Enhance exposure, knowledge and technical capacity on best conservation practices	No.	NA		1		1				1
	2.1.1: Conduct awareness program on FNCA, FNCRR & Guidelines, Forest Fire, waste management, G2C, OFS	No.	1		1			1			
2. To ensure sustainable management of forest resources and generate revenue											



	2.2.1: Support construction of flag hoisting structures at strategic locations/chiwogs	No. of flag hoisting structures constructed at strategic locations	No.	0		2	2	2	2	2	2					
	2.2.2: Initiate construction of flag hoisting structures in CFs and NWFP Management Groups	No. of flag hoisting structures facilitated in CFs and NWFP	No.	0		2	3	4	4	4	4	2				
	2.2.3: Identify and map potential area to meet pyre wood demand (Juni-per)	Area identified and mapped for pyrewood collection	No.	0	1			1			1				1	
	2.3.1: Map hot-spots for illegal forest activities (Timber and NWFPs)	Area of illegal forest activities mapped	No.	0		1									1	
	2.3.2: Conduct periodic and long-range patrolling using SMART Tool	No. of periodic and long range patrol conducted	No	8	8	8	8	8	8	8	8	8	8	8	8	

[illegible]

 3. To ensure biological integrity of flora and fauna through periodic assessment and monitoring	2.4.9: Provide feed and fodder for management of wildlife at the Royal Takin Preserve, Motithang	Wildlife managed with enclosure	Days	365															
	2.4.10: Maintain Forest Nurseries at Samazingkha	No of forest nurseries maintained	No	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	2.4.11: Facilitate export of timber and NWFPs	No of export proposal facilitated	No	NA															
	3.1.1: Carry out tiger population survey as a part of the nationwide tiger population revalidation survey	No of survey conducted	No.	2	1														1
	3.1.2: Determine the population or abundance Musk Deer as a part of the nationwide survey	No of survey conducted	No	0	1														
	3.1.3: Conduct eDNA survey as a part of nationwide survey	No of survey conducted	No	0	1														

[illegible]

3.1.9: Conduct periodic (annual monitoring) of all forest management regimes including plantations	Monitoring of existing management regimes conducted	No	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
3.1.10: Conduct mid-term and final evaluation of all forest management regimes including plantations	No. of mid term evaluation conducted	No	28																	
3.1.11: Conduct compliance monitoring of the terms and conditions of the Forestry Clearances	No of FCs monitored	No	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
3.1.12: Monitor the biodiversity monitoring grids	No of Biodiversity Monitoring Grids monitored	No	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
3.1.13: Conduct SMART patrol and forest surveillance using Drone	No of SMART Patrol conducted	No	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340

3.2.1: Conduct timely detection of forest pest and disease for remedial actions	No of forest pest and disease monitoring conducted	No	NA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3.2.2: Monitor sanitation operations executed by authorized agencies	No	NA															
	3.2.3: Prepare Forest fire hotspot maps and develop fire suppression action plan	No	NA	1														
	3.2.4: Strengthen IFFCG through periodic meetings and review of SoP	No	1/year	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3.2.5: Establish Community Based Forest Fire Management Groups (Gewog/Chiwog Level)	No	0															



4: To enhance sustainable forest management through community participation and income generation towards improving community livelihood	4.1.1 Facilitate to set up CF and NWFP Administration	No of CF & NWFP offices constructed	No	0	1	2	4	4	4	4	3	1		
	4.2.1 Capacity building of CFMGs on record keeping, silviculture system, networking, exchange programs, value addition and product diversification	Capacity building of CFs/ NWFP initiated	No	21	23	23	23		23			23	23	23
	4.2.2 Provide technical backstopping to CF members on plantation and nursery techniques	No of technical backstopping provided	No	0			21				21			
	4.2.3 Enhance value addition and processing of finished products from surplus timber/sanitation timber	No of value addition and processing of finished products initiated	No	0		1						1		

[illegible]

5.1.2 Conduct awareness on Human Wildlife Conflict (HWC) mitigation	No of awareness conducted	No	1		1					1						1	
5.2.1 Reduce crop damage and livestock depredation by facilitating solar fencing/chain link fencing	No of HWC interventions initiated	No	0	2													
5.2.2 Restore habitat through maintenance of existing water holes	No of water holes restored	No	0		1												
5.2.3 Facilitate habitat enrichment through execution of enrichment plantation	No of habitat enrichment plantation created	No	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2
5.2.4 Equip rescue teams with essential field equipment (dart gun, cage drug)	No of dart guns and drugs procured	No	1	1													

5.2.5 Conduct effectiveness assessment of HWC interventions in two hot spot gewogs (Mewang and Dagala)	No of assessment on HWC interventions	No	0		2														
	No of wildlife rescue and rehabilitation executed	No	NA																
	No of landscape management conducted	No	1																
	Area brought under restoration program	Hectare	12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5.3.2 Implement nature-based solutions to restore degraded and barren area																			

6.3 Management and Monitoring Framework for High Conservation Value Area

The primary objective of monitoring is to evaluate the implementation of HCV management strategies and assess the extent to which management objectives are being achieved. Monitoring results provide managers with current information about the HCVs under their stewardship, serving as a foundation for informed management interventions or adjustments to management plans.

Table 42: Management and Monitoring Framework of HCVA

Strategy	Outcome	Output	Activity	Location	Time-frame	Budget Nu. (Million)	Monitoring Indicator	Target
Identification of active responses towards addressing both existing and emerging threats	Forest Eco-system including water quantity and quality maintained	Payment for Environmental Services (PES) initiated	1. Periodic monitoring of water quality and quantity (DoW)	Dagala Gewog	July-August 2026	0.05	Report	1 report
			2. Mapping of water recharge zone		September-October 2027	0.20	Report	1 report
			3. Mapping of lakes within HCVA		April-May 2028	0.20	Report	1 report
			4. Facilitate tsamdro management plan development for the plots falling within the HCVA		March-April 2028	0.25	Approved plan	TBD
			5. Support/facilitate upscaling of solar coral fencing		May-June 2028	0.50	Acre	TBD
			6. Support maintenance of trail		August-September 2028	0.05	meters	TBD
			7. Support capacity building for NWFP executive members on administration and good governance		July-August 2026	0.03	Number of participants	1 report
			8. Assist Jhomdhaga Ngomen Tshogpa to identify additional market for NWFPs		August-September 2027	0.02	MoU	1MoU
			9. Support prescribed burning to enhance rangeland quality		March-April 2027	0.20	Acre	TBD
			10. Conduct conservation and legal awareness to communities and LG leaders		August-September 2028	0.10	NMB	1 PPT/Report
			11. Conduct SMART Patrol		November-December 2027	0.05	SMART Report	1 report

			12. Initiate formation of forest fire management group at Gewog/Chiwog level		September-October 2027	0.20	Management plan	1 Plan
			13. Procurement of forest firefighting equipment		January-February 2027	0.15	NMB	TBD
			14. Conduct periodic assessment of forest pest and disease outbreak		Quarterly/Annually	0.15	Report	TBD
			15. Execute timely sanitation operation		Quarterly/Half yearly/Annually	0.02	Award Letter	TBD
			16. Conduct PES initiation consultation workshop/meeting		February-March 2028	0.40	1	1 report
			17. Prepare/develop PES Management Plan		July-December 2028	0.20	1	1 plan
			18. Develop annual operation plan		January 2029	0.03	1	1 OP document



Chapter 7: Stakeholder consultation and endorsement

7.1 Stakeholder Consultation

Stakeholder consultation of the plan document in general and specifically on management interventions related to local communities were consulted with all the stakeholders of Chang, Dagala, Geney, Kawang and Mewang Gewogs including the sectors from Dzongkhag Administration, Thimphu on 27th December 2024. Since management interventions for the HCVA requires attention of the Thimphu Thromde, the consultation was also attended by an official from Thimphu Thromde where details of the participants were recorded both through registration and payment of daily subsistence allowance supported by the IKI living landscape project. Besides a prolonged deliberation on High Conservation Value Area, other discussions mainly surrounded around forest resource allotment and human wildlife conflict issues in the division. All the five gewogs represented by the Local Government Leaders (Gup/Mangmi and five Tshogpas from each gewog) along with sectors heads from Thimphu Dzongkhag and an official from Thimphu Thromde supported the plan and its management prescriptions as outlined under Chapter 4 of this document.


WWF
 Title: DFO Management Plan Consultation Meeting
 Venue: NRDCL Conference Hall, Thimphu

Sl. No.	Name	Gender (M/F)	Organization/ Agency	Email	Contact#	Date: 27/12/2024
1	Kings Zungmo	F	Dagala Gewog	queenga69@gmail.com	77303036	
2	Kezang Wangmo	F	Dagala Gewog	—	17746092	
3	Phub Pem	F	"	Phubpem2022@gmail.com	77301764	
4	Dago Pem	F	"	Dago P daga pem@gmail.com	7746664	
5	Chen Chetj	F	"	chenyang312@gmail.com	17673772	
6	Wangyal Wangmo	F	"	widhatawala@gmail.com	77490805	
7	Kunju Wangmo	F	Chang	kunju57@gmail.com	17685192	
8	Tenzin	M	TDA	tenzin.tenzin@thimphu.gov.bt	17685964	
9	Jamyang Namgyal	F	Chang	jamyangnamgyal@gmail.com	17653480	
10	Dawa Sam	F	Mewang	dawasam1932@gmail.com	7732567	
11	Pema Choden	F	Chang	pemachoden@gmail.com	17615167	
12	Kezang Dema	F	Kawang	—	17380022	

 **IKI** INTERNATIONAL CLIMATE INITIATIVE

Divisional Forest Office, Thimphu



Title: DFO Management Plan Consultation Meeting
Venue: NRDC Conference Hall, Thimphu

Sl. No.	Name	Gender (M/F)	Organization/ Agency	Email	Contact#	Date: 27/12/2024
13	Gyem Tenzin	M	Tshaluna	gyemf55@gmail.com	17638968	
14	Tshering Choden	F	Kawang	tsheringchoden88@gmail.com	77809545	
15	Kinley Penjor	M	Kawang	-	17655011	
16	Wangdi	M	Kawang	-	17892152	
17	Wangdi Gyelshi	F	Geney	wangdi764@gmail.com	17644967	
18	Tandin Pema	M	Mewang	tandinpema966@gmail.com	17411181	
19	Tandin Choden	F	Geney	tandinchoden12@gmail.com	17692775	
20	Kendro Gyeltshen	M	Geney	kenchog77@gmail.com	17971189	
21	Kintley Wangchuk	M	Geney	kinleyw345@gmail.com	17234014	
22	Tandin Wangye	M	Namchi, Mewang	Tandin.wangye@gmail.com	17454565	
23	Choki Dorji	M	Mewang	-	17345443	
24	Phuwa	M	Singha	-	17608077	



Title: DFO Management Plan Consultation Meeting
Venue: NRDC Conference Hall, Thimphu

Sl. No.	Name	Gender (M/F)	Organization/ Agency	Email	Contact#	Date: 27/12/2024
25	Tandin	M	Geney	-	19579262	
26	Rinzin	M	Mangwa Mewang	rinzin@gmail.com	17767605	
27	Tashi Namgyal	M	Tshagpa	Tsheringnamgyal22@gmail.com	77293199	
28	Kenchu	M	Gup Geney	kenchugene@gmail.com	17488885	
29	Sonam Dorji	M	Maeshi Mewang	-	1734620	
30	Kenchu Tshering	M	Tshagpa	kenchus45@gmail.com	17334014	
31	Tshering Choden	F	Local Registrar	tsheringc@thimphu.gov.bt	17609423	
32	GADDO	M	DAGALA	thirzengad@gmail.com	17600912	
33	Sonu Loday	M	TDA	sloday@thimphu.gov.bt	17596945	
34	Lamdzin	M	TDA	lamdzin@moat.gov.bt	17610880	
35	Tshering Namgyal	M	Khazangphu	tshering@moat.gov.bt	17849623	
36	Dechen Wangdi	M	DFO, Thimphu	dechenwangdi@moat.gov.bt	17698786	



WWF

Title: DFO Management Plan Consultation Meeting
Venue: NRDC Conference Hall, Thimphu

Sl. No.	Name	Gender (M/F)	Organization/ Agency	Email	Contact#	Date: 27/12/2024
37	Sherab Gyeltshen	M	Govt. of Thimphu	Govt. of Thimphu	17656428	
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40	Karma Dorji	M	ThFD	karmad@moenr.gov.bt	17998056	
41	Nguen Dorji	M	ThFD	nenjenguen@gmail.com	17610105	
42	Sonam Uktu Dorje	F	Golden FMU	sonamuktudorje@gmail.com	17991149	
43	Chorten	M	ThFD	chorten100@gmail.com	17645252	
44	Chimi Dema	F	DFO, Thimphu	cdema@moenr.gov.bt	17732844	
45	Pema Dorji	M	ThFD	pemadorji@gmail.com	17553219	
46	Lhaba	M	ThFD	lhaba@moenr.gov.bt	17514140	
47	Pema Wangda	M	ThFD	pawangda@moenr.gov.bt	17611754	

IKI INTERNATIONAL CLIMATE INITIATIVE

7.2 Finalization and Endorsement of DFO Management Plan

This management plan is prepared under the technical guidance of the Task Force constituted by the Department of Forests and Park Services. The document underwent a series of rigorous internal reviews including a Pre-TAC assessment, prior to its submission to the Technical Advisory Committee, the principal technical review body at the departmental level. The draft plan was first presented during the 75th TAC Meeting held from 15th to 19th December 2025. However, the Committee did not endorse the plan as it required substantial revisions and technical improvements.

Following the incorporation of the comments and recommendations from the 75th TAC, the revised draft was further reviewed by the Forest Resources Planning and Management Division before being resubmitted to the 77th TAC Meeting held on 30th January 2026. Endorsement was again deferred due to identified inconsistencies in the facts, figures and technical specifications of the maps included in the document.

After carefully addressing all observations and fully incorporating the Committee's recommendations, the plan was presented during the 78th TAC Meeting held from 16th to 17th February 2026 where it was formally endorsed. Subsequently, the endorsed plan was recommended by the Head of the Department for its approval from the Ministry where it is eventually approved by the Ministry of Energy and Natural Resources for its implementation commencing 2026.

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Annexure I: List of birds recorded during Rapid Biodiversity Assessment

Sl No	Species	Family	IUCN Category	Schedule (I, II & III of FNCA 2023)
1	Alpine Accentor	Prunellidae	Least Concern	III
2	Ashy Drongo	Dicruridae	Least Concern	III
3	Ashy-throated Warbler	Phylloscopidae	Least Concern	III
4	Bhutan Laughingthrush	Leiothrichidae	Least Concern	II
5	Black Bulbul	Pycnonotidae	Least Concern	III
6	Black Eagle	Accipitridae	Least Concern	III
7	Black-faced Laughingthrush	Leiothrichidae	Least Concern	III
8	Black-faced Warbler	Cettiidae	Least Concern	III
9	Black-throated Bush Tit	Aegithalidae	Least Concern	III
10	Blood Pheasant	Phasianidae	Least Concern	III
11	Blue Rock Thrush	Turdidae	Least Concern	III
12	Blue Whistling Thrush	Muscicapidae	Least Concern	III
13	Blue-fronted Redstart	Muscicapidae	Least Concern	III
14	Blue-winged Laughingthrush	Leiothrichidae	Least Concern	III
15	Blyth's Leaf Warbler	Phylloscopidae	Least Concern	III
16	Blyth's Reed Warbler	Acrocephalidae	Least Concern	III
17	Brown Bullfinch	Fringillidae	Least Concern	III
18	Brown Bush Warbler	Locustellidae	Least Concern	III
19	Brown Parrotbill	Paradoxornithidae	Least Concern	III
20	Chestnut-crowned Laughingthrush	Leiothrichidae	Least Concern	III
21	Chestnut-headed Tesia	Cettiidae	Least Concern	III
22	Chestnut-headed tit	Cettiidae	Least Concern	III
23	Chestnut-tailed Minlla	Leiothrichidae	Least Concern	III
24	Coal Tit	Paridae	Least Concern	III
25	Collared Grosbeak	Fringillidae	Least Concern	III
26	Common Hawk Cuckoo	Cuculidae	Least Concern	III
27	Common Hoopoe	Upupidae	Least Concern	III
28	Common Kestrel	Falconidae	Least Concern	III
29	Common Rosefinch	Fringillidae	Least Concern	III
30	Crimson Sunbird	Nectariniidae	Least Concern	III
31	Darjeeling Woodpecker	Picidae	Least Concern	III
32	Dark-rumped Rosefinch	Fringillidae	Least Concern	III
33	Eurasian Cuckoo	Cuculidae	Least Concern	III
34	Eurasian Wren	Troglodytidae	Least Concern	III
35	Fire-tailed Sunbird	Nectariniidae	Least Concern	III

36	Gould's Shortwing	Muscicapidae	Least Concern	III
37	Great Barbet	Megalaimidae	Least Concern	III
38	Great Tit	Paridae	Least Concern	III
39	Green-backed Tit	Paridae	Least Concern	III
40	Green-tailed Sunbird	Nectariniidae	Least Concern	III
41	Greenish Warbler	Phylloscopidae	Least Concern	III
42	Grey-backed Shrike	Laniidae	Least Concern	III
43	Grey-crested Tit	Paridae	Least Concern	III
44	Grey-hooded Warbler	Phylloscopidae	Least Concern	III
45	Hill Partridge	Phasianidae	Least Concern	III
46	Himalayan Bluetail	Turdidae	Least Concern	III
47	Himalayan Buzzard	Accipitridae	Least Concern	III
48	Himalayan Cuckoo	Cuculidae	Least Concern	III
49	Himalayan Monal	Phasianidae	Least Concern	II
50	Himalayan Swiftlet	Apodidae	Least Concern	III
51	House Crow	Corvidae	Least Concern	III
52	Indian Blue Robin	Muscicapidae	Least Concern	III
53	Kalij Pheasant	Phasianidae	Least Concern	III
54	Large Hawk Cuckoo	Cuculidae	Least Concern	III
55	Large-billed Crow	Corvidae	Least Concern	III
56	Lemon-rumped Warbler	Phylloscopidae	Least Concern	III
57	Lesser Cuckoo	Cuculidae	Least Concern	III
58	Long-tailed Minivet	Campephagidae	Least Concern	III
59	Long-tailed Shrike	Laniidae	Least Concern	III
60	Long-tailed Thrush	Turdidae	Least Concern	III
61	Mrs Gould's Sunbird	Nectariniidae	Least Concern	III
62	Orange-flanked Bush Robin	Turdidae	Least Concern	III
63	Oriental Cuckoo	Cuculidae	Least Concern	III
64	Oriental Turtle Dove	Columbidae	Least Concern	III
65	Plumbeous Water Redstart	Muscicapidae	Least Concern	III
66	Red-billed Chough	Corvidae	Least Concern	III
67	Red-billed Leiothrix	Leiothrichidae	Least Concern	III
68	Red-tailed Minla	Leiothrichidae	Least Concern	III
69	Rufous Sibia	Leiothrichidae	Least Concern	III
70	Rufous-breasted Accentor	Prunellidae	Least Concern	III
71	Rufous-breasted Bush Robin	Muscicapidae	Least Concern	III
72	Rufous-chinned Laughingthrush	Leiothrichidae	Least Concern	III
73	Rufous-fronted Tit	Aegithalidae	Least Concern	III
74	Rufous-vented Tit	Paridae	Least Concern	III
75	Rusty-flanked Treecreeper	Certhiidae	Least Concern	III
76	Satyr Tragopan	Phasianidae	Least Concern	II

77	Scarlet Minivet	Campephagidae	Least Concern	III
78	Shikra	Accipitridae	Least Concern	III
79	Snow Pigeon	Columbidae	Least Concern	III
80	Speckled Wood Pigeon	Columbidae	Least Concern	III
81	Spotted Bush Warbler	Locustellidae	Least Concern	III
82	Spotted Forktail	Muscicapidae	Least Concern	III
83	Spotted Laughingthrush	Leiothrichidae	Least Concern	III
84	Spotted Nutcracker	Corvidae	Least Concern	III
85	Striated Prinia	Cisticolidae	Least Concern	III
86	Stripe-throated Yuhina	Zosteropidae	Least Concern	III
87	Tibetan Snowcock	Phasianidae	Least Concern	II
88	Whistler's Warbler	Phylloscopidae	Least Concern	III
89	White-browed Bush Robin	Muscicapidae	Least Concern	III
90	White-browed Fulvetta	Paradoxornithidae	Least Concern	III
91	White-browed Rosefinch	Fringillidae	Least Concern	III
92	White-capped Water Redstart	Muscicapidae	Least Concern	III
93	White-collared Blackbird	Turdidae	Least Concern	III
94	White-hooded Babbler	Pellorneidae	Least Concern	III
95	White-tailed Nuthatch	Sittidae	Least Concern	III
96	White-throated Dipper	Cinclidae	Least Concern	III
97	White-throated Laughingthrush	Leiothrichidae	Least Concern	III
98	White-winged Grosbeak	Fringillidae	Least Concern	III
99	Yellow-billed Blue Magpie	Corvidae	Least Concern	III
100	Yellow-cheeked Tit	Paridae	Least Concern	III

Annexure II: Bhutan METT+ Internal Assessment (DFO Thimphu)

Name, affiliation and contact details for person responsible for completing the Bhutan METT + (email etc.)		Lhaba, Sr. Forestry Officer, ThFD, 17614140, lhaba76@gmail.com		
Date assessment carried out		24th August 2021 to 26th August 2021		
Name of Forest Division		Divisional Forest Office, Thimphu		
WDPA site code (codes can be searched for on: www.protectedplanet.net/)				
Designations	National: Divisional Forest Office	IUCN Category National Category (to list based on site needs-CF, FUMs,		International (see below)
Location of Field Division (province and if possible map reference)		Thimphu District, Western Bhutan		
Date of establishment (dd/mm/yyyy)		2nd October 1969		
Ownership details (please tick)	State Reserved Forest Land	Private	Community	Other
Management Authority	Divisional Forest Office			
Size of forest division (sq.km)	864.58			
Number of staff	Permanent or Regular: Technical = 81 (58 male & 23 female) Non-Technical = (6male and 1 female)	Temporary (same)Contract Workers (ESP) = 56 (17 male & 39 female)		
Annual budget (Nu) – excluding staff salary costs	Current budget (operational costs, e.g. staff costs): Current =54.439m Capital =3.0m	Capital budget (infrastructure development etc):		
What are the main values for which the area is designated		Sustainable management of forest resources		
List the two primary protected area management objectives				
Management objective 1		Sustainable management and utilization of forest resources		
Management objective 2		Deliver forestry services		
No. of people involved in completing assessment				
Including: (highlight where appropriate)	FD Manager (Gyeltshen Dukpa, CFO)	FD staff 17 (9 male & 8 female)	Other FD agency staff	NGO
	Local community	Donors	External experts	Other
Please note if assessment was carried out in association with a particular project, on behalf of an organisation or donor.		IKI Project		
Information on International Designations (where applicable)				
UNESCO World Heritage site				
Date listed	Site name	Site area		

Criteria for designation (i.e. criteria i to x)				
Statement of Outstanding Universal Value				
Ramsar site				
Date listed	Site name and number		Site area	
Criteria for Designation & ecological character (see Ramsar Information Sheet)				
UNESCO Man and Biosphere Reserves				
Date listed	Site name		Site area	
			Total:	
			Core:	
			Buffer:	
			Transition:	
Criteria for designation				
Fulfilment of three functions of MAB (conservation, development and logistic support.)				
Please list other designations and any supporting information below				
Name:	Detail:			
Name:	Detail:			
Name:	Detail:			

Forest Division Threats: Assessment Sheet 1

In the assessment below threats should be:

Ranked as of **high** significance if they are seriously degrading values; **medium** if they are having some negative impact and **low** if they are present but not seriously impacting values. **Not applicable** (N/A) is selected when the threat is either not present or not applicable in the protected area.

Note that threats ranked as of medium and high significance can be assessed in more detail using Assessment Sheet 2.

Assessed at three levels:

1. **Current threat:** in which case a 'C' is put in either the High, Medium or Low box
2. **Potential threat:** in which case a 'P' is put in either the High, Medium or Low box
3. **Issues:** in which case an 'I' is put in either the High, Medium or Low box

*Each threat identified could have both a current threat assessment (e.g. assessed as low) and a potential threat (e.g. assessed as medium). The category of 'issues' has been added because some management issues may not be strictly regarded as threats but need constant management intervention to ensure they do not become a threat. For example, plants collected for medicinal use could be a management **issue**; or a current or potential threat if management activities are not effective in controlling the collection levels or processes.*

Guidance in making the assessment

Unlike many other countries in the region (and worldwide) the level of threats are fairly low at present in Bhutan and thus what might be considered of high threat here, may not be at anything like the same scale as in other countries. Guidance in what is meant by the categories high, medium and low threats in a Bhutanese context has thus been developed for threats marked ** (see Annexe 1). **Threat categories with specific guidance are marked by a *.**

Specific guidance on assessing threats in the Bhutanese context are also given in boxes below each threat.

1. Residential and commercial development within a protected area/ forest division

Threats from human settlements or other non-agricultural land uses with a substantial footprint

High	Medium	Low	N/A	
	p	c		1.1 Housing and settlement
	p	c		1.2 Commercial and industrial areas
	p	c		1.3 Tourism and recreation infrastructure

2. Agriculture and aquaculture within a protected area/ forest division

Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture

High	Medium	Low	N/A	
		c		2.1 Annual and perennial non-timber crop cultivation
			na	2.1a Medicinal plant cultivation*
	p	c		2.2 Wood and pulp plantations
	p	c		2.2a Community forestry
		c		2.2b Private forestry (e.g. planting of exotic species)
	c	p		2.3 Livestock farming and grazing**
	p	c		2.3a Land encroachment for agriculture
p	c			2.3b Land lease of government reserve land for commercial farming
		c		2.4 Freshwater aquaculture
<i>Threat 2.1a Medicinal plant cultivation: Note that the collection of species from the wild is covered in threat 5.2</i>				

3. Energy production and mining within a protected area/ forest division

Threats from production of non-biological resources

High	Medium	Low	N/A	
			na	3.1 Oil and gas drilling
		p		3.2 Mining and quarrying**
	p	c		3.3 Energy generation, including from hydropower dams*
<i>3.3 Energy generation including HEP: This question looks specifically at threats within protected areas. Most of the hydropower developments in Bhutan are outside protected areas but distant HEP systems can still impact on the protected area, the impact of such threats is covered in threat 7.2.</i>				

4. Transportation and service corridors within a protected area/ forest division

Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality

High	Medium	Low	N/A	
				4.1 Roads and railroads (include road-killed animals)**
	c	p		4.2 Utility and service lines (e.g. electricity cable lines, telephone lines)*/**
			na	4.3 Flight paths*
<i>4.2 Utility and service lines: Given the pace of infrastructure development in Bhutan (e.g. high tension cables, service centres etc) it was felt this threat should consider both impacts in the protected area and in the buffer zones.</i>				
<i>4.3 Flight paths: It should be stressed that this threat is considering flight paths of aeroplanes, hot air balloons, gliders etc, not the flight paths of birds</i>				

5. Biological resource use and harm within a protected area/ forest division

Threats from consumptive use of “wild” biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species (note this includes hunting and killing of animals)

High	Medium	Low	N/A	
				5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wild-life conflict)
	c, p			5.1a Human wildlife conflict**
	p	c		5.1b Wildlife Poaching**
				5.2 Gathering terrestrial plants or plant products (non-timber)
		c		5.2a Mushrooms**
	p	c		5.2b Plant species for medicinal use**
	p	c		5.2c Plant species for food**
	p	c		5.3 Illegal logging and timber harvesting**
	p	c		5.3a Legal logging and timber harvesting**
	p	c		5.4 Fishing and harvesting aquatic resources

6. Human intrusions and disturbance within a protected area/ forest division

Threats from human activities that alter, destroy or disturb habitats and species associated with non-consumptive uses of biological resources

High	Medium	Low	N/A	
				6.1 Recreational activities and tourism
		c		6.1a Unmanaged ecotourism**
			na	6.2 War, civil unrest and military exercises*
		c		6.3 Research, education and other work-related activities in forest divisions
		c		6.4 Activities of FD Managers (e.g. construction or vehicle use, artificial watering points and dams)
			na	6.5 Deliberate vandalism or destructive activities
<i>6.2 War, civil unrest and military exercises: in the case of Bhutan war and civil unrest should include intrusion of political insurgency from across the border</i>				

7. Natural system modifications

Threats from other actions that convert or degrade habitat or change the way the ecosystem functions

High	Medium	Low	N/A	
			NA	7.1 Fire and fire suppression (including arson)**
		c		7.2 Dams, hydrological modification and water management/use*/**
			N/A	7.3a Increased fragmentation within forest division

			NA	7.3b Isolation from other natural habitat (e.g. deforestation, dams without effective aquatic wildlife passages)
			NA	7.3c Other 'edge effects' on protected area values
		c		7.3d Loss of keystone species (e.g. top predators, pollinators etc)
Whereas threat 3 looked at impacts of infrastructure development in protected areas, threat 7 looks at impacts which may occur from developments far away from the actually protected area. As noted above most of the hydropower developments in Bhutan are outside protected areas but distant HEP systems can still impact on the protected area. Threat 7.2 should record impacts on habitat or changes in the way the ecosystem functions, such as changing water flow patterns.				

8. Invasive and other problematic species and genes

Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic materials that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase

High	Medium	Low	N/A	
		c		8.1a Invasive non-native/alien plants (weeds)
			na	8.1b Invasive non-native/alien animals
			na	8.1c Invasive non-native/alien freshwater fish
			na	8.1d Pathogens (non-native or native but creating new/increased problems)
			na	8.2 Introduced genetic material (e.g. genetically modified organisms)

9. Pollution entering or generated within protected area/forest division

Threats from introduction of exotic and/or excess materials or energy from point and non-point sources

High	Medium	Low	N/A	
				9.1 Household sewage and urban waste water
		c, p		9.1a Sewage and waste water from protected area facilities (e.g. toilets, hotels etc)
		c, p		9.2 Industrial, mining and military effluents and discharges (e.g. poor water quality discharge from dams, e.g. unnatural temperatures, de-oxygenated, other pollution)
		c, p		9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)
	p	c		9.4 Garbage and solid waste**
			na	9.5 Air-borne pollutants
			na	9.6 Excess energy (e.g. heat pollution, lights etc)

10. Geological events

Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance. Management capacity to respond to some of these changes may be limited.

High	Medium	Low	N/A	
			na	10.1 Volcanoes
	p			10.2 Earthquakes/Tsunamis
	p	c		10.3 Avalanches/ Landslides
	p	c		10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)

11. Climate change and severe weather

Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation

High	Medium	Low	N/A	
		p		11.1 Habitat shifting and alteration
			na	11.2 Droughts
			na	11.3 Temperature extremes
	p	c		11.4 Storms and flooding

12. Specific cultural and social threats

High	Medium	Low	N/A	
	p	c		12.1 Loss of cultural links, traditional knowledge and/or management practices
	p	c		12.2 Natural deterioration of important cultural site values
		c		12.3 Destruction of cultural heritage buildings, gardens, sites etc

Protected Area Threats: Assessment Sheet 2

As the severity and impact of threats in Bhutan are expected to increase over the next few years, in part due to infrastructure development and the relative ease of access/communications that new roads and mobile phone coverage are allowing, the Bhutan METT + includes a more detailed assessment of major threats.

The assessment form allows a more detailed assessment of the current or potential threats identified as having medium or high significance in Assessment Sheet 2.

1. Specify threat: Housing and settlement

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Delivery of forestry services as per the forestry rules and regulations.
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

2. Specify threat: Commercial and industrial areas

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	The activities are implemented as per the DPR
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

3. Specify threat: Tourism and recreation infrastructure

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat

A: Small section of the site (5-10%):	A: Minor impact:	Ecotourism management plan endorsed by Zhemgang Dzongkhag Administration, and activities are implemented as per the plan
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

4. Specify threat: Wood and pulp plantations

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Any wood and pulp plantation are done based on the FNCRR 2017 & 2020
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

5. Specify threat: Community forestry

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Implemented as per the CF management plans and FNCRR 2017,2020 (amendment)
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

6. Specify threat: Livestock farming and grazing

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat

A: Small section of the site (5-10%):	A: Minor impact:	Reduction in the cattle migration and Tsamdru, introduction of improved breed, improved grass
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

7. Specify threat: Land encroachment for agriculture

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Enforcement of Forest and Nature Conservation Rules and Regulation 2017 & 2020 (amendments)
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

8. Specify threat: Land lease of government reserve land for commercial farming

Threat (specific if current or potential): C, P

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	As per FNCRR 2017&2020, Land Act
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

9. Specify threat: Energy generation, including from hydropower dams*

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Feasibility assessment being conducted as per FNCRR2-17&2020

B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

10. Specify threat: Roads and railroads (include road-killed animals)**

Threat (specific if current or potential): c, p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Proper monitoring of the site as per terms of FC and restoration of damaged sites, SMART patrolling
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

11. Specify threat: Utility and service lines (e.g. electricity cable lines, telephone lines)*/**

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Proper monitoring of the site as per terms of FC and restoration of damaged sites.
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

12. Specify threat: Human Wildlife Conflict

Threat (specific if current or potential): c, p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Stringent data collection and project based incentives to farmers

B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

13. Specify threat: Wildlife Poaching**

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Strict compliance of SMART patrolling, regulated as per FNCRR 2017 & 2020 (amendment)
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

14. Specify threat: Plant species for medicinal use**

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Collection of Piper is done as NWFP management, timing for collection of Paris polyphilla is done as per FNCRR 2017 & 2020
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

15. Specify threat: Plant species for food**

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Sustainable collection of NWFPs as per FNCRR 2017

B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

16. Specify threat: Illegal logging and timber harvesting**

Threat (specific if current or potential): P

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Implementation of SMART patrolling, laws & rules, impose fines and penalties
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

17. Specify threat: Legal logging and timber harvesting**

Threat (specific if current or potential): p

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Scientific management of timber harvesting as per FNCRR 2017&2020 (amendment) and management plans for LFMPs, CF, Extraction Plan
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

18. Specify threat: Fishing and harvesting aquatic resources

Threat (specific if current or potential): P

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat

A: Small section of the site (5-10%):	A: Minor impact:	Strick implementation of SMART Patrolling Fines and penalty as per FNCRR 2017&2020 and following the prescribe management plan.
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

19. Specify threat: Garbage and solid waste**

Threat (specific if current or potential): P

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Implementation of waste management rules and regulations, involvement of public and students during the monthly waste program and zero waste hours
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

20. Specify threat: Earthquakes

Threat (specific if current or potential): P

Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	No management interventions
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

21. Specify threat: Landslides		
<i>Threat (specific if current or potential): P</i>		
Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Land management activities, climate smart restoration are being done
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

22. Specify threat: Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)		
<i>Threat (specific if current or potential): P</i>		
Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Climate smart restoration, soil and land management interventions
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

23. Specify threat: Storms and flooding		
<i>Threat (specific if current or potential): P</i>		
Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	River mitigation work in case of flooding
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

24. Specify threat: Natural deterioration of important cultural site values		
Threat (specific if current or potential): P		
Impact of threat	Management response	
Extent: Describe the extent of the impact under one of the three descriptors given below	Severity: Describe how severe the impact under one of the three descriptors given below	Action: What actions are planned or have taken place to manage the threat
A: Small section of the site (5-10%):	A: Minor impact:	Renovation/restoration of religious and cultural sites
B: Several areas of the site (11-50%):	B: Major impact but not continuous:	
C: Most of the site (51-100%):	C: Major continuous impact:	

Protected Areas Management Activities: Assessment Sheet 3

Please tick the two critical management activities currently undertaken in the protected area	Comment/Explanation
☐ Law enforcement and surveillance	SMART patrolling, FNCA 1995, FNCRR 2017 & 2020 (amendment)
☐ Promoting sustainable resource use	Scientific management of forest resources, as per FNCRR, Implementation of CFMPs, NWFPs, LFMPs & FMU
☐ Working with local communities	
☐ Education and awareness	
☐ Demarcation and zoning	
☐ Monitoring	
☐ Research	
☐ Management planning	
☐ Ecotourism	
☐ Building institutional and governance capacity	
☐ Species management	
☐ Infrastructure development	
☐ Fundraising	
☐ Restoration	
☐ Fire management	
☐ Resolving tenure problems	
☐ Human-wildlife conflict management	
☐ Alien species control	
☐ External communication and publicity	
☐ Equipment and facilities	
☐ Improving habitat	
☐ Species (re)introduction / control / breeding	
☐ Working with regional authorities	
☐ Other	

Issue	Criteria	Score: Tick only one box per question		Comment/Explanation	Nextsteps
1. Legal status	The protected area/ Divisional Forest Office is not gazetted/covenanted	0		FD has clear administrative boundary covering whole of four gewogs (Chang, Dagala, Geney, Mewang) and part of Kawang Gewog under Thimphu Dzongkhag. Formally/officially gazetted on 2nd October 1969	Trace for office order
Does the protected area/Divisional Forest Office has legal status (or in the case of private reserves is covered by a covenant or similar)?	There is agreement that the protected area should be gazetted/covenanted but the process has not yet begun	1			
Context	The protected area is in the process of being gazetted/covenanted but the process is still incomplete (includes sites designated under international conventions, such as Ramsar, or local/traditional law such as community conserved areas, which do not yet have national legal status or covenant)	2			
	The protected area has been formally gazetted/covenanted	3	3		
2. Protected area/ forest division regulations	There are no regulations for controlling land use and activities in the protected area	0		Regulations (FNCA, FNCRR) do exist to control land use and other activities on state reserved forest land. However, priority for economic development is inconsistent with existing regulations	Identify and address the gaps. Propose necessary amendment in FNCRR.
Are appropriate regulations in place to control land use and activities (e.g. hunting)?	Some regulations for controlling land use and activities in the protected area exist but there are major weaknesses	1			
Planning	Regulations for controlling land use and activities in the protected area exist but there are some weaknesses or gaps	2	2		

	Regulations for controlling inappropriate land use and activities in the protected area exist and provide an excellent basis for management	3			
3. Law enforcement Can staff (i.e. those with responsibility for managing the site) enforce protected area rules well enough? Input	The staff have no effective capacity/resources to enforce protected/forest division area legislation and regulations	0		1. Uniform understanding/interpretation and implementation of rule is a huge challenge 2. Inadequate travel budget and resources (mobility) hinder regular field visits and enforcement	Awareness training among rule implementing field officers. Need to pay attention on mobility/pool vehicle
	There are major deficiencies in staff capacity/resources to enforce protected area/forest division legislation and regulations (e.g. lack of skills, no patrol budget, lack of institutional support)	1	1		
	The staff have acceptable capacity/resources to enforce protected area legislation and regulations but some deficiencies remain	2			
	The staff have excellent capacity/resources to enforce protected area/forest division legislation and regulations	3			

4. Protected area/ forest division objectives	No firm objectives have been agreed for the protected area/forest division	0		The main objectives of the division are sustainable man- agement of forest resources including patrolling, enforce- ment and service delivery which are basically covered/ agreed in the APA.	Need to focus more on divisional mandate.
Is management undertaken ac- cording to agreed objectives?	The protected area/ forest division has agreed objectives, but is not managed according to these objectives	1			
Planning	The protected area/ forest division has agreed objectives, but is only partially managed according to these objectives	2	2	However other overriding programs tend to take major chunk of time and human resources	
	The protected area/ forest division has agreed objectives and is managed to meet these objec- tives	3			
5. Protected area/ forest division design	Inadequacies in protected area/for- est division design mean achieving the major objectives of the protected area is very difficult	0		From accessibility and service delivery point of view	Strengthen the exist- ing field offices/ Beat Of- fices
Is the protect- ed area/forest division the right size and shape to meet the objec- tives (protect species, habitats, ecological pro- cesses and water catchments of key conservation concern, resource utilization)					
Planning					

	Inadequacies in protected area/forest division design mean that achievement of major objectives is difficult but some mitigating actions are being taken (e.g. agreements with adjacent land owners for wildlife corridors or introduction of appropriate catchment management)	1			
	Protected area/forest division design is not significantly constraining achievement of objectives, but could be improved (e.g. with respect to larger scale ecological processes)	2			
	Protected area/forest division design helps achievement of objectives; it is appropriate for species and habitat conservation; and maintains ecological processes such as surface and groundwater flows at a catchment scale, natural disturbance patterns etc	3	3		
6. Protected/FD area boundary demarcation Is the boundary known and demarcated? Process	The boundary of the protected area/forest division is not known by the management authority or local residents/neighbouring land users	0		Part of Chang Gewog which was once under BC II got excluded from Protected Area System (PAs) from March 2020	Boundary demarcation along areas adjoining JDNP and BC II

	The boundary of the protected area/forest division is known by the management authority but is not known by local residents/neighbouring land users	1			
	The boundary of the protected area/forest division is known by both the management authority and local residents/neighbouring land users but is not appropriately demarcated	2	2		
	The boundary of the protected area is known by the management authority and local residents/neighbouring land users and is appropriately demarcated	3			
7. Management plan	There is no management plan for the protected area/forest division	0	0	Although there is management regime such as CF, FMU and LFMP for some part of the divisional area, it currently lacks a consolidated or holistic management plan as of date.	Prepare one within IKI Project period
Is there a management plan and is it being implemented?	A management plan is being prepared or has been prepared but is not being implemented	1			
Planning	A management plan exists but it is only being partially implemented because of funding constraints or other problems	2			
	A management plan exists and is being implemented	3			
Bhutan METT+: If a management plan is just running out and there is a process underway to redo the plan this is equivalent to score 3: a management plan exists					
<i>Additional points: Planning</i>					

7a. Planning process	The planning process allows adequate opportunity for key stakeholders to influence the management plan	1	0		
7b. Planning process	There is an established schedule and process for periodic review and updating of the management plan	1	0		
7c. Planning process	The results of monitoring, research and evaluation are routinely incorporated into planning	1	0		
8. Regular work plan	No regular work plan exists	0		Regular work plan exist but challenged by inadequate resources and weak coordination	Coordination meeting required before start of FY and towards the end of FY.
Is there a regular work plan and is it being implemented	A regular work plan exists but few of the activities are implemented	1			
Planning/Outputs	A regular work plan exists and many activities are implemented	2	2		
	A regular work plan exists and all activities are implemented	3			
9. Resource inventory	There is little or no information available on the resource (critical habitats, species(flora & fauna), growing stocks and cultural values) of the protected area/forest division	0		Considering the availability of existing management regimes such as CF, FMUs, LF-MPs, and checklist of flora and fauna, the division does have certain level of information for planning. However, there is no adequate information on population, abundance and distribution to support planning and decision making	Bring the remaining gewogs under LFMP
Do you have enough information to manage the area?					
Input					

	Information on the resource (critical habitats, species(-flora & fauna), growing stocks and cultural values) of the protected area/ forest division / not sufficient to support planning and decision making	1	1		
	Information on the resource (critical habitats, species(-flora & fauna), growing stocks and cultural values) of the protected area/ forest division / sufficient for most key areas of planning and decision making	2			
	Information on the resource (critical habitats, species(-flora & fauna), growing stocks and cultural values) of the protected area/ forest division / sufficient for all areas of planning and decision making	3			
10. Protection systems	Protection systems (patrols, permits etc) do not exist or are not effective in controlling access/resource use	0		Generally guided by FNCRR 2017 and its amendment 2020. However fully regulated access to forest resources (particularly firewood, flag poles, leaf mould) is not possible	Determine and stick to harvesting limit
Are systems in place to control access/resource use in the protected area/forest division?	Protection systems are only partially effective in controlling access/resource use	1			
Process/Outcome	Protection systems are moderately effective in controlling access/resource use	2	2		

	Protection systems are largely or wholly effective in controlling access/resource use	3			
11. Research	There is no survey or research work taking place in the protected area	0		Part of NFI and NTS. Regular survey/assessment include CF resource assessment, Operational inventories and sanitation operations	Species based research
Is there a programme of management-orientated survey and research work?	There is some survey and research work but it is not directed towards the needs of protected area management	1			
Process	There is some survey and research work which is at least partly directed towards the needs of protected area management	2			
	There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs	3			
12. Resource management	Active resource management is not being undertaken	0		Resource allotment/management from areas with management plan are undertaken strictly following the AAC.	Bring the remaining areas under one suitable management plan
Is active resource management being undertaken?	Very few of the requirements for active management of critical habitats, species, ecological processes, cultural values and sustainable resource production are being implemented	1	1		
Process					

	Many of the requirements for active management of critical habitats, species, ecological processes, cultural values and sustainable resource production are being implemented but some key issues are not being addressed	2			
	Requirements for active management of critical habitats, species, ecological processes, cultural values and sustainable resource production are being substantially or fully implemented	3			
12a: Management of NTFPs	A management plan exists for the management of all major non timber forest products actively collected within the protected area	1	1		
12b: Management of medicinal plants	A management plan exists for the management of all major medicinal plants actively collected within the protected area	1	1		
12c: Management of Other conservation areas (OCAs)	A management plan exists for all Other conservation areas (OCAs) within the protected area/forest division	1	0		
Bhutan METT+: consideration of this question includes issues relating to land leasing					

13. Staff numbers Are there enough people employed to manage the protected area/ forest division? Inputs	There are no staff	0		Number seems to be adequate or even excess but existing composition cannot really cater to growing demand for forestry services
	Staff numbers are inadequate for critical management activities	1		
	Staff numbers are below optimum level for critical management activities	2	2	
	Staff numbers are adequate for the management needs of the protected area	3		
14. Staff training Are staff adequately trained to fulfil management objectives? Inputs/Process	Staff lack the skills needed for protected area management	0		Need to identify and agree upon important training need areas
	Staff training and skills are low relative to the needs of the protected area/ forest division	1	1	
	Staff training and skills are adequate, but could be further improved to fully achieve the objectives of management	2		
	Staff training and skills are aligned with the management needs of the protected area	3		
15. Current budget Is the current budget sufficient? Inputs	There is no budget for management of the protected area	0		Available budget in a way restricts staff movement (travel budget) and deletion of few budget head
	The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage	1	1	
	The available budget is acceptable but could be further improved to fully achieve effective management	2		

	The available budget is sufficient and meets the full management needs of the protected area	3			
Bhutan METT+: Budgets in Bhutan are divided by capital budget (infrastructure development etc) and current budget (operational costs, e.g. staff costs). Consideration of both budgets should be made when answering question 15 (16 and 17). The comment/explanation column should be used to detail specific issues concerning budget allocations etc.					
16. Security of budget	There is no secure budget for the protected area/forest division and management is wholly reliant on outside or highly variable funding	0		Field divisions depend on budget allocated through Functional divisions on deposit work	
Is the budget secure?	There is very little secure budget and the protected area/ forest division could not function adequately without outside funding	1			
Inputs	There is a reasonably secure core budget for regular operation of the protected area/forest division but many innovations and initiatives are reliant on outside funding	2	2		
	There is a secure budget for the protected area/ forest division and its management needs	3			
17. Management of budget	Budget management is very poor and significantly undermines effectiveness (e.g. late release of budget in financial year)	0		Despite the inadequacy of budget, there is prioritization and rationalization of activities/ movement	
Is the budget managed to meet critical management needs?					
Process	Budget management is poor and constrains effectiveness	1			

	Budget management is good and actions are prioritised when funds are inadequate to meet management needs	2	2		
	Budget management is excellent and meets management needs	3			
18. Equipment	There are little or no equipment and facilities for management needs	0		Basic equipments are available but need to procure few	
Is equipment sufficient for management needs?	There are some equipment and facilities but these are inadequate for most management needs	1			
Input	There are equipment and facilities, but still some gaps that constrain management	2	2		
	There are adequate equipment and facilities	3			
Bhutan METT+: Most protected areas cover large areas, there are thus likely to be differences in equipment availability in park headquarters and guard posts around the park. Question 18 should consider equipment across the whole protected area and specific concerns regarding availability should be included in the comment/explanation and next steps column					
19. Maintenance of equipment	There is little or no maintenance of equipment and facilities	0		Done on adhoc basis and depends on availability of fund which is not reliable	
Is equipment adequately maintained?	There is some ad hoc maintenance of equipment and facilities	1	1		
Process	There is basic maintenance of equipment and facilities	2			
	Equipment and facilities are well maintained	3			

20. Education and awareness	There is no education and awareness programme	0		Done on rotational basis	
Is there a planned education programme linked to the objectives and needs?	There is a limited and ad hoc education and awareness programme	1			
Process	There is an education and awareness programme but it only partly meets needs and could be improved	2	2		
	There is an appropriate and fully implemented education and awareness programme	3			
21. Planning for land and water use	Adjacent land and water use planning does not take into account the needs of the protected area/ forest division and activities/policies are detrimental to the survival of the area	0			
Does land and water use planning outside the protected area/ forest division recognise the protected area/ forest division and aid the achievement of objectives?	Adjacent land and water use planning does not take into account the long term needs of the protected area/forest division, but activities are not detrimental the area	1			
Planning	Adjacent land and water use planning partially takes into account the long term needs of the protected area/forest division	2	2		
	Adjacent land and water use planning fully takes into account the long term needs of the protected area/forest division	3			

Bhutan METT +: This question is specific to activities outside of the protected area. EIA's are supposed to take place for any developments. Issues in Bhutan include hydropower, transmission lines and mining.					
<i>Additional points: Land and water planning</i>					
21a: Land and water planning for habitat conservation	Planning and management in the catchment or landscape containing the protected area/forest division incorporates provision for adequate environmental conditions (e.g. volume, quality and timing of water flow, air pollution levels etc) to sustain relevant habitats	1	0		
21b: Land and water planning for connectivity	Management of corridors linking the protected area/ forest division provides for wild-life passage to key habitats outside the protected area (e.g. to allow migratory fish to travel between freshwater spawning sites and the sea, or to allow animal migration)	1	0		
21c: Land and water planning for ecosystem services and species conservation	Planning addresses ecosystem-specific needs and/or the needs of particular species of concern at an ecosystem scale (e.g. volume, quality and timing of freshwater flow to sustain particular species, fire management to maintain grassland habitats etc.)	1	0		

22. State and commercial neighbours	There is no contact between managers and neighbouring official or corporate land and water users	0			
Is there co-operation with adjacent land and water users?	There is contact between managers and neighbouring official or corporate land and water users but little or no co-operation	1	1		
Process	There is contact between managers and neighbouring official or corporate land and water users, but only some co-operation	2			
	There is regular contact between managers and neighbouring official or corporate land and water users, and substantial co-operation on management	3			
22a: State and commercial neighbours	There is regular contact and substantial cooperation with any hydropower developers and operators whose operations impact protected area management	1	1		
22b: State and commercial neighbours	There is regular contact and substantial cooperation with any developers and operators of linear infrastructure (e.g. transmission lines and/or roads) whose operations impact protected area management	1	1		

22c: State and commercial neighbours	Where the protected area/forest division provides important natural resources for commercial operations (e.g. municipal water companies or hydropower operators) payments for ecological services agreements are in place	1	0		
23. Local communities	Local communities have no input into decisions relating to the management of the protected area/ forest division	0			
Do local communities resident or near the protected area/forest division have input to management decisions?	Local communities have some input into discussions relating to management but no direct role in management	1	1		
Process	Local communities directly contribute to some relevant decisions relating to management but their involvement could be improved	2			
	Local communities directly participate in all relevant decisions relating to management, e.g. co-management	3			
<i>Additional points Local communities</i>					
23a: Impact on communities	There is open communication and trust between local people, stakeholders and protected area/forest division managers	1	1	CF, water sources	

23b: Impact on communities	Programmes to enhance community welfare, while conserving protected area/forest division resources, are being implemented	1	1	CF, NWFP	
23c: Impact on communities	Local people actively support the protected area/forest division	1	0		
24. Economic benefit	The protected area/forest division does not deliver any economic benefits to local communities	0		sale of excess timber from CF	
Is the protected area/forest division providing economic benefits to local communities, e.g. income, employment, payment for environmental services?	Potential economic benefits are recognised and plans to realise these are being developed	1			
	There is some flow of economic benefits to local communities	2	2		
Outcomes	There is a major flow of economic benefits to local communities from activities associated with the protected area/forest division	3			
25. Monitoring and evaluation	There is no monitoring and evaluation in the protected area/forest division	0		Gathering of evidences including photographic evidences for APA Evaluation	
Are management activities monitored against performance?	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results	1			
Planning/Process	There is an agreed and implemented monitoring and evaluation system but results do not feed back into management	2	2		

	A good monitoring and evaluation system exists, is well implemented and used in adaptive management	3			
26. Visitor facilities	There are no visitor facilities and services despite an identified need	0	0		
Are visitor facilities adequate?	Visitor facilities and services are inappropriate for current levels of visitation	1			
Outputs	Visitor facilities and services are adequate for current levels of visitation but could be improved	2			
	Visitor facilities and services are excellent for current levels of visitation	3			
27. Commercial tourism operators	There is little or no contact between managers and tourism operators using the protected area/ forest division	0			
Do commercial tour operators contribute to protected area/ forest division management?	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters	1	1		
Process	There is limited co-operation between managers and tourism operators to enhance visitor experiences and maintain protected area values	2			

	There is good co-operation between managers and tourism operators to enhance visitor experiences, and maintain protected area/forest division values	3			
28. Fees	Although fees are theoretically applied, they are not collected	0			
If fees (e.g. entry fees) are applied, do they help protected area/forest division management?	Fees are collected, but make no contribution to the protected area/forest division or its environs	1	1		
Inputs/Process	Fees are collected, and make some contribution to the protected area/forest division and its environs	2			
	Fees are collected and make a substantial contribution to the protected area/forest division and its environs	3			
29. Fines	There are no fines, or fines are theoretically applied but are seldom or never collected	0			
If fines (e.g. poaching fines) are applied, do they help protected area management?	Fines are collected, but make no direct contribution to the protected area/forest division or its environs	1	1		
Inputs/Process	Fines are collected, and make some contribution to the protected area/forest division and its environs	2			

	Fines are collected and make a substantial contribution to the protected area/ forest division and its environs	3			
Bhutan METT +: The term “protected area or its environs” can include incentive schemes such as payments to informers of poachers					
30. Condition of biodiversity and ecological values	Many biodiversity and ecological values are being severely degraded	0			
What is the condition of the important biodiversity values of the protected area as compared to when it was first designated? Outcomes	Some biodiversity and ecological values are being severely degraded	1			
	Some biodiversity and ecological values are being partially degraded but the most important values have not been significantly impacted	2	2		
	Biodiversity and ecological values are predominantly intact	3			
<i>Additional Points: Condition of values</i>					
30a: Condition of biodiversity values	The assessment of the condition of biodiversity and ecological values is based on research and/or monitoring	1	0		
30b: Condition of biodiversity values	Specific management programmes are being implemented to address threats to biodiversity and ecological values	1	0		
30c: Condition of biodiversity values	Activities to maintain key biodiversity and ecological values are a routine part of protected area/forest division management	1	0		

Bhutan METT + questions					
31. Condition of cultural values	Many cultural values are being severely degraded	0			
What is the condition of the important cultural values of the protected area/ forest division as compared to when it was first designated?	Some cultural values are being severely degraded	1			
	Some cultural values are being partially degraded but the most important values have not been significantly impacted	2	2		
Outcomes	Cultural values are predominantly intact	3			
32. Access	Staff are unable to move around the protected area/forest division and thus much of the protected area is inaccessible throughout the year	0			
How accessible is the protected area/forest division?					
Planning / Process	There are significant restrictions on the ability of staff to move around the protected area/forest division throughout the year (e.g. in the rainy season) and thus much of the protected area (e.g. over 50 % of the area) is inaccessible some or all of the year	1			

	Staff are able to move relatively easily around the protected area and thus most of the protected area/forest division is accessible, although some areas (e.g. less than 50 % of the area) remain inaccessible some or all of the year	2	2		
	Staff are able to move easily around the whole protected area/forest division and the majority of the protected area is fully accessible	3			
33. Neighbouring protected areas/ forest division	There is no contact between managers of adjoining protected areas/forest division on issues which impact protected area/forest division management effectiveness	0			
Is there co-operation with adjoining protected areas/forest division (national and international)?	There is limited contact between managers of adjoining protected areas/ forest division but little cooperation on issues which impact protected area management effectiveness	1			
Process	There is contact between managers of adjoining protected areas/forest division and some cooperation on protected area/forest division management effectiveness	2	2		

	There is regular contact between managers of adjoining protected areas/ forest division and full cooperation on ensuring management effectiveness	3			
34. Is the protected area/forest division being consciously managed to adapt to climate change?	There have been no efforts to consider adaptation to climate change in management	0			
Planning	Some initial thought has taken place about likely impacts of climate change, but this has yet to be translated into management plans	1	1	Not much actions/ programs initiated to address climate change	
	Limited plans have been drawn up about how to adapt management to predicted climate change, which may or may not be being implemented	2			
	Detailed plans have been drawn up about how to adapt management to predicted climate change, and these are already being implemented	3			
35. Is the protected area/forest division being consciously managed to prevent carbon loss and to encourage further carbon capture?	Carbon storage and carbon dioxide capture has not been considered in management of the protected area/forest division	0			
Process					

	Carbon storage and carbon dioxide capture has been considered in general terms, but has not yet been significantly reflected in management	1	1	Not much emphasis is given to carbon storage and carbon loss even in the existing management plans	Need to consider this in the DFO management plan
	There are active measures in place to reduce carbon loss from the protected area/forest division, but no conscious measures to increase carbon dioxide capture	2			
	There are active measures in place both to reduce carbon loss from the protected area/forest division and to increase carbon dioxide capture	3			
		123	59		
		47.9%			

