NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLAN

BHUTAN 2025

NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLAN, 2025

DEDICATED TO THE FOURTH DRUK GYALPO
JIGME SINGYE WANGCHUCK
ON THE OCCASION OF HIS MAJESTY'S 70TH BIRTH ANNIVERSARY CELEBRATION

NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLAN

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ROYAL GOVERNMENT OF BHUTAN

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"Throughout the centuries, the Bhutanese have treasured their natural environment and have looked upon it as the source of all life. This traditional reverence for nature has delivered us into the twentieth century with our environment still richly intact. We wish to continue living in harmony with nature and to pass on this rich heritage to our future generations."

HIS MAJESTY THE FOURTH DRUK GYALPO
JIGME SINGYE WANGCHUCK

Rhododendron kesangiae D.G. Long & Rushforth named in honor of Queen Grandmother Ashi Kesang Choden Wangchuck of Bhutan.

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We are especially grateful to His Excellencies and the distinguished members of the Competent National Authority (CNA) and the National Environment Commission (NEC) for endorsing this national document, a testament to Bhutan's unwavering commitment to biodiversity conservation and sustainable development.

Sincere thanks are also extended to the many individuals and institutions who participated in regional consultations, thematic assessments, and review workshops, including youth, women's groups, religious institutions, and local communities, for ensuring that the updated NBSAP is people-centred, gender-responsive, and grounded in local realities.

We with gratitude the financial and technical support provided by the Global Environment Facility (GEF), UNDP, and the Secretariat of the Convention on Biological Diversity (CBD) through the GEF Early Action Support, Umbrella Support and BIOFIN Projects.

Lastly, we commend the NBSAP Secretariat and secretarial support team at the NBC for their tireless coordination of this multi-year effort. This document reflects Bhutan's enduring dedication to safeguarding biodiversity as a national treasure and a global responsibility, for the benefit of present and future generations.

FOREWORD

As Bhutan aspires to become a High-Income Gross National Happiness (GNH) Economy by 2034, there could be no more fitting moment than now to launch the fifth edition of our NBSAP. It is with a deep sense of responsibility that I present this fifth edition of the NBSAP – a document thoughtfully crafted to align with the Kunming-Montreal Global Biodiversity Framework, while remaining firmly rooted in addressing Bhutan's unique biodiversity challenges, developmental priorities and our shared national aspiration to build a happy, prosperous and secure future.

This fifth edition of the NBSAP builds on the foundation of continuous learning and the acknowledgement of the need to evolve to be dynamic, effective and relevant document. The 20 National Targets are formulated based on the assessment outcomes of the 4th edition of NBSAP and the emerging opportunities and untapped potential of biodiversity in achieving the Sustainable Development Goals. The strategy reflects our philosophy of respecting and caring for all forms of life and their interconnectedness, grounded in the deep understanding that biodiversity is not only the cornerstone of ecological health but also an integral part of our cultural values, livelihoods, and national heritage.

As Bhutan aspires to achieve developed nation status in the next decade, while preserving its unique development philosophy of GNH, we stand at a pivotal moment in our socio-economic transformation. The NBSAP, as a high-level strategic document, offers a pathway to progress that safeguards the integrity of our ecosystems and upholds our commitment to environmental stewarship. It provides a clear framework to attain economic prosperity without compromising our rich biodiversity and health of our ecosystems.

As a party to the Convention on Biological Diversity, Bhutan has consistently fulfilled its obligation to formulate and submit a National Biodiversity Strategy and Action Plans. It is truly heartening to witness the same level of unwavering commitment in the preparation of this fifth NBSAP. I extend my sincere appreciation to the National Biodiversity Centre under the Ministry of Agriculture and Livestock and the Department of Environment and Climate Change, Ministry of Energy and Natural Resources for their leadership in this effort. I am equally pleased that the document was developed by a team of national experts representing all relevant stakeholders. Notably, its targets and strategies are grounded in extensive consultations at both local and regional levels, engaging stakeholders and community leaders to address biodiversity challenges and harness local opportunities.

This fifth edition of NBSAP is both a reflection of our achievement and a bold, forward-looking framework for biodiversity conservation and sustainable use. It adopts innovative, inclusive, and adaptive approaches to biodiversity management, recognizing the vital role of science, traditional knowledge, and community participation in tackling complex challenges. From ecosystem restoration, species and local genetic diversity conservation, and sustainable use of natural resources, to pollution reduction, climate change adaptation, and institutional strengthening the strategy calls for transformative actions that are firmly grounded in national realities and aspirations. I urge all stakeholders – government agencies, local governments, communities, civil society organisations, the private sector, academia, and development partners - to embrace this document as a national guiding framework for biodiversity stewardship. Let us join hands to ensure its implementation is effective, inclusive, and immensely impactful.

Together, let us build a future where our ecological wealth underpins our economic prosperity and where the harmony between people and nature remains the guiding principle of our national development journey.

Lyonpo Younten Phuntsho
Minister
Ministry of Agriculture and Livestock
Chair, Competent National Authority

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ABBREVIATIONS AND ACRONYMS

ABS	Access and Benefit Sharing
ADSS	Agromet Decision Support System
ARDC	Agriculture Research and Development Centre
BAP	Biodiversity Action Plan
BFDA	Bhutan Food and Drug Authority
BFL	Bhutan For Life
BTFEC	Bhutan Trust Fund for Environmental Conservation
CBD	Convention on Biological Diversity
CBI	City Biodiversity Index
CEPA	Communication, Education, and Public Awareness
CFs	Community Forests
cft	Cubic feet
CHM	Clearing House Mechanism
CNA	Competent National Authority
CNR	College of Natural Resources
CSOs	Civil Society Organizations
CWRs	Crop Wild Relatives
DECC	Department of Environment and Climate Change
DoA	Department of Agriculture
DoE	Department of Energy
DoFPS	Department of Forests and Park Services
DoL	Department of Livestock
DoRF	Division of Responsibility Framework
DoW	Department of Water
DSI	Digital Sequencing Information
EPR	Extended Producer Responsibility
FMID	Forest Monitoring and Information Division
FMUs	Forest Management Units
FNCRR	Forest and Nature Conservation Rules and Regulations
FYP	Five-Year Plan
GAP	Good Agricultural Practices
GBF	Global Biodiversity Framework
GBIF	Global Biodiversity Information Facility
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GLOFs	Glacial Lake Outburst Floods
GMC	Gelephu Mindfulness City
GMOs	Genetically Modified Organisms

GNH	Gross National Happiness
ha	Hectares
HWC	Human–Wildlife Conflict
IAS	Invasive Alien Species
ICP	Integrated Check Post
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
KMGBF	Kunming-Montreal Global Biodiversity Framework
LDC	Least Developed Country
LFs	Local Forests
LMOs	Living Modified Organisms
M&E	Monitoring and Evaluation
masl	Metres above sea level
METT+	Management Effectiveness Tracking Tool Plus
MoAL	Ministry of Agriculture and Livestock
MoENR	Ministry of Energy and Natural Resources
MW	Megawatts
NA	National Assembly
NBC	National Biodiversity Centre
NbS	Nature-based Solutions
NBSAP	National Biodiversity Strategies and Action Plan
NCD	Nature Conservation Division
NCWC	National Commission for Women and Children
NDC	Nationally Determined Contributions
NEC	National Environment Commission
NLUZ	National Land Use Zoning
NSB	National Statistics Bureau
NUS	Neglected and Underutilized Species
NWFPs	Non-Wood Forest Products
OECMs	Other Effective Area-based Conservation Measures
PAs	Protected Areas
PEER	Public Environmental Expenditure Review
PES	Payment for Ecosystem Services
PPP	Public-Private Partnerships
REDD+	Reducing Emissions from Deforestation and Degradation
RGoB	Royal Government of Bhutan
RNR	Renewable Natural Resources
RSPN	Royal Society for Protection of Nature
RUB	Royal University of Bhutan
SCP	Sustainable Consumption and Production

SDGs	Sustainable Development Goals
SEEA	System of Environmental-Economic Accounting
SFM	Sustainable Forest Management
SLM	Sustainable Land Management
SMART	Spatial Monitoring and Reporting Tool
SOPs	Standard Operating Procedures
sq. km	Square Kilometres
SRF	State Reserved Forest
TK	Traditional Knowledge
TWG	Technical Working Group
WWF	World Wildlife Fund
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
USD	United States Dollar

GLOSSARY

Chhuzhing	Irrigated paddy
Dru Na Ghu	Nine Types of Cereal
Dzongkhag	District
Sgrubchhu	Sacred Spring
Kamzhing	Dryland Farming
Menchhu	Medicinal Spring
Sowa Rigpa	Bhutanese Traditional Medicine
Thromde	Town/City/Municipality/Urban Area
Tshachhu	Hot Spring
Yartsa Goenbub	Caterpillar Fungus (*Ophiocordyceps sinensis*)

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CHAPTER 1
INTRODUCTION

Courtesy: DoT

This chapter provides an overview of Bhutan's conservation legacy, current biodiversity status, and the ecological, economic, and cultural values of biodiversity.

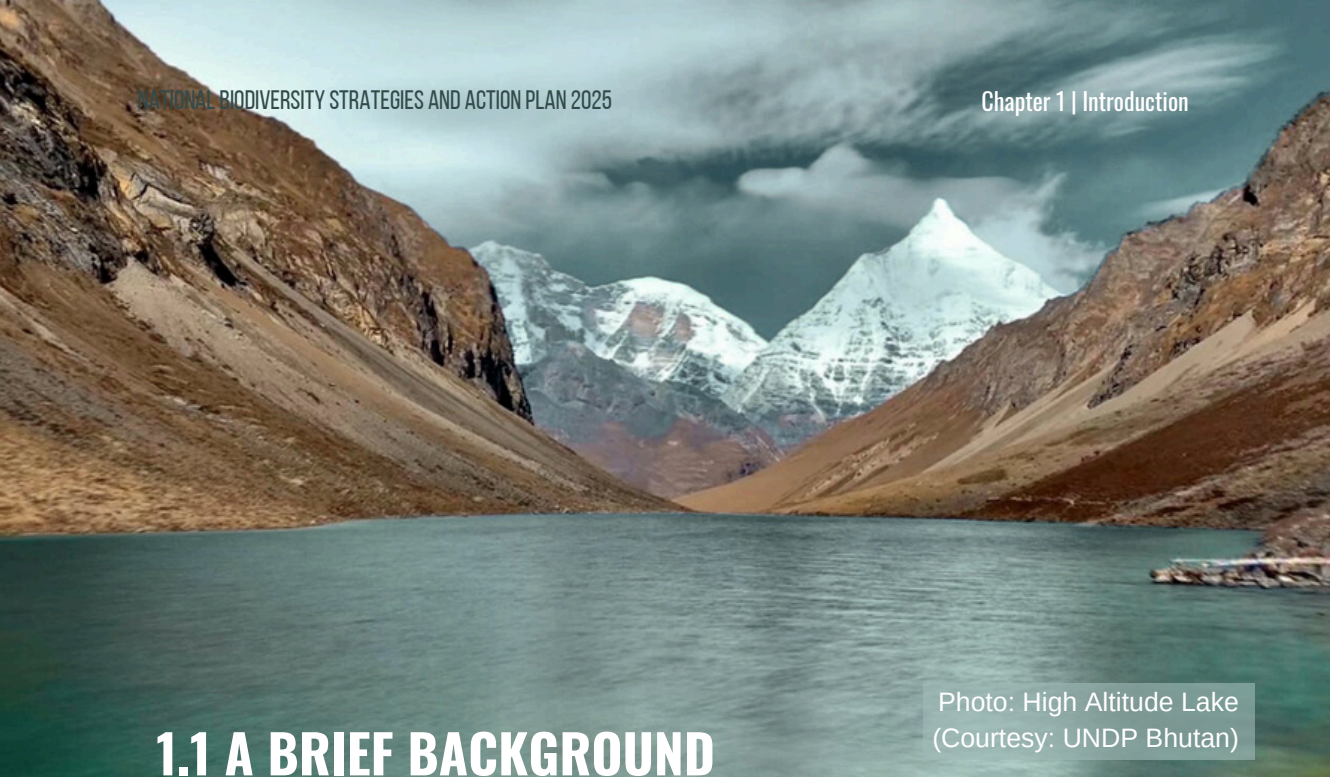


Photo: High Altitude Lake
(Courtesy: UNDP Bhutan)

1.1 A BRIEF BACKGROUND

Bhutan is a small, landlocked country located in the Eastern Himalayas. It spans across an area of 38,394 square kilometres (sq. km) and shares its northern border with China, and southern, eastern, and western borders with India. The country's topography is defined by rugged mountainous terrain, with altitudinal variation ranging from 100 to over 7,500 metres above sea level (masl). This steep elevational gradient from south to north gives rise to a rich diversity of ecosystems and habitats (NSB, 2020).

Ecologically, the country is divided into six agro-ecological zones, ranging from wet subtropical lowlands to the alpine regions, shaped by variations in altitude, temperature, and precipitation (NBC, 2019). These zones support diverse and distinct vegetation types, land use systems, and biodiversity.

Bhutan constitutes 7.6% of the Himalayan Biodiversity Hotspot (CEPF, 2024), with 11,248 species recorded to date, including high levels of endemism and a rich diversity of flora and fauna (NBC, 2019). The country's unique location, coupled with its conservation-focused development philosophy, has enabled the preservation of vast tracts of intact ecosystems (RGoB, 2008). Forests cover approximately 69.7% of Bhutan's land area (FMID, 2023), providing critical ecological services and forming the backbone of the country's biodiversity. Furthermore, 52% of Bhutan's territory is under legal protection through a well-connected network of protected areas and biological corridors (NBC, 2019; WWF Bhutan, 2023).

1.2 BHUTAN'S CONSERVATION HISTORY

Bhutan's commitment to nature conservation has deep historical roots, grounded in cultural values and visionary leadership. The country's modern conservation journey began in 1952 with the establishment of the Department of Forests. With the introduction of the Five-Year Plan development model in 1961, environmental considerations began to be systematically integrated into national planning. Bhutan designated its first protected area, Manas Wildlife Sanctuary, in 1966, and in 1969, the Forest Act formally brought all unregistered lands under government jurisdiction as State Reserved Forests.

The National Forest Policy of 1974 further institutionalized Bhutan's environmental ethos by mandating the maintenance of at least 60% forest cover in perpetuity, a commitment later enshrined in Article 5 of the Constitution of the Kingdom of Bhutan (2008).

In 1984, two regional wildlife units were established to manage protected areas and wildlife conservation. These were merged in 1992 to form the Nature Conservation Division (NCD) under the Department of Forests and Park Services (DoFPS), which today serves as the national focal agency for protected area planning, management, and coordination. That same year, the National Environment Committee was elevated to the National Environment Commission (NEC), providing a high-level mechanism for cross-sectoral environmental governance.

Photo: Black-throated Prinia (*Prinia atrogularis*)
(Courtesy: Tshering Tobgay)

In 1992, Bhutan became one of the first countries globally to establish an environmental endowment fund, the Bhutan Trust Fund for Environmental Conservation (BTFEC), initially capitalized at United States Dollar (USD) 21 million. The BTFEC plays a critical role in financing conservation priorities and mitigating biodiversity risks from development.

Following Bhutan's ratification of the Convention on Biological Diversity (CBD) in 1995, the first Biodiversity Action Plan (BAP 1997) recommended establishing a dedicated agency for biodiversity governance. The National Biodiversity Centre (NBC) was accordingly created in 1998 to lead biodiversity research, genetic resource management, and policy coordination.

In 2018, Bhutan launched Bhutan for Life (BFL), Asia's first Project Finance for Permanence initiative. BFL secures long-term funding for protected areas, supports climate resilience, and promotes community-based conservation. These milestones reflect Bhutan's enduring efforts to balance development with ecological integrity. Anchored in the Gross National Happiness[1] (GNH) philosophy, where environmental conservation is one of four pillars, Bhutan continues to lead in global biodiversity stewardship. The present National Biodiversity Startegies and Action Plan (NBSAP) builds on this legacy, aligning national action with the Kunming-Montreal Global Biodiversity Framework.

[1]Bhutan's holistic development philosophy based on four pillars, sustainable development, environmental conservation, cultural preservation, and good governance.

CONSERVATION AWARDS AND RECOGNITION

Bhutan has received numerous awards and international recognition for its unwavering commitment to conservation and environmental sustainability. These accolades reflect the nation's proactive approach to environmental stewardship, deeply embedded within the development philosophy of GNH. Some of the honors include the following:

Her Majesty Gyalyum Tseyring Pem Wangchuck was awarded the Champions of the Rising Leader award for her dedication to environmental conservation and for inspiring and nurturing the next generation of environmental leaders.

The United Nations Environment Programme (UNEP) bestowed Earth award to Bhutan for its holistic approach to environmental conservation.

His Majesty Jigme Singye Wangchuck, the Fourth King of Bhutan was awarded Blue Planet Prize for the development philosophy of Gross National Happiness (GNH)- a unique philosophy which guided Bhutan's development path and inspiring wider adoption in the world.

The TED Prize was awarded to Bhutan's Prime Minister, Jigme Y Thinley, in recognition of the country's pioneering commitment to Gross National Happiness (GNH), which includes environmental conservation as a core component.

The Environmental Protection Agency (EPA) in the United States, recognized Bhutan for its leadership in environmental governance and carbon-negative policies.

The World Wildlife Fund (WWF) conferred the J. Paul Getty Conservation Leadership Award to the King of Bhutan, His Majesty Jigme Singye Wangchuck for Bhutan's leadership and making a conscious decision to place environmental protection at the centre of national life, going so far as to include it in the new Constitution.

1.3 OVERVIEW OF BIODIVERSITY OF BHUTAN

A. ECOSYSTEM DIVERSITY

I. FOREST ECOSYSTEM

Forests are the dominant terrestrial ecosystem in Bhutan and form the ecological backbone of the country's biodiversity. Bhutan's forests are distributed across a wide altitudinal and climatic gradient, that support exceptional species richness and ecosystem services. Among major forest types, cool broadleaved forests are the most extensive, covering 28.2% of the national land area. These are followed by warm broadleaved forests (25.0%), fir forests (16.2%), and subtropical forests (13.3%). Other forest ecosystems include hemlock forests (4.9%), blue pine (3.9%), chir pine (2.9%), juniper-rhododendron (2.6%), spruce (1.6%), and evergreen oak forests (1.5%) (FMID, 2023).

These diverse forest ecosystems provide critical habitat for endemic and threatened species, regulate hydrological cycles, stabilize mountain slopes, and contribute to carbon sequestration. They are also deeply integrated into local livelihoods, culture, and climate resilience.

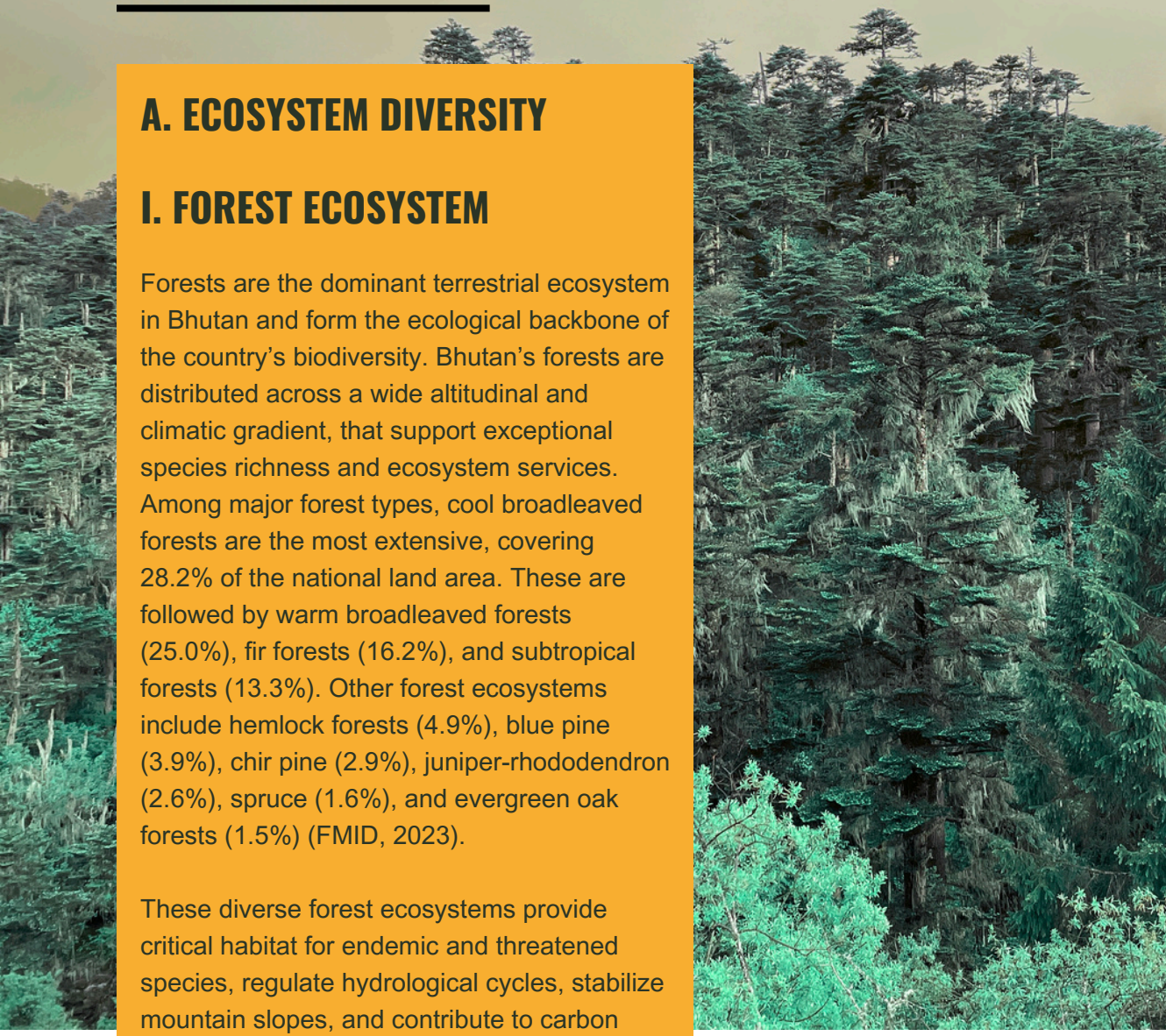


Photo: Fir Forest
(Courtesy: Karma Wangchuk)

Photo: High Altitude Lake
(Courtesy: UNDP)

II. AQUATIC ECOSYSTEM

Bhutan is endowed with rich freshwater resources comprising rivers, lakes, springs, and wetlands. These systems provide vital ecosystem services including drinking water, irrigation, energy generation, flood regulation, and habitat for diverse aquatic species, many of which are endemic or have limited distribution.

The country is hydrologically divided into five major river systems and their basins: *Amochhu*, *Wangchhu*, *Punatsangchhu*, *Mangdechhu*, and *Drangmechhu.* In addition, five minor basins, *Jaldakha*, *Aiechhu*, *Nyera Amari*, *Jomori*, and *Merak-Sakteng* further enrich Bhutan's hydrological complexity (ADB & NEC, 2016). Manas, Bhutan's largest river is formed by the confluence of the *Drangmechhu* and *Mangdechhu*. Together, these freshwater systems provide essential ecological functions and contribute significantly to Bhutan's natural capital. Given their ecological, economic, and cultural importance, the protection and sustainable management of freshwater ecosystems are critical.

Lakes: Bhutan's lakes, both glacial and freshwater, play a vital role in maintaining hydrological balance and regulating river flow. As of 2021, a total of 567 glacial lakes have been identified, with 17 classified as potentially dangerous due to the risk of Glacial Lake Outburst Floods (GLOFs) (NCHM, 2021). Collectively, these lakes cover approximately 0.14% of Bhutan's land area, with *Thorthormi* Lake being the largest, spanning 4.20 sq. km (NCHM, 2021).

Spring: Springs form another critical component of Bhutan's freshwater systems, supplying water for drinking, irrigation, and commercial use. Over 5,001 springs have been tapped nationwide (WMD, 2021). In addition, 10 hot springs (*Tshachhu*), 17 mineral or medicinal springs (*Menchhu*), and 17 sacred springs (*Sgrubchhu*) have been documented (Wangchuk et al., 2021). Some well-known hot springs include Gasa *Tshachhu* (Gasa), Gelephu *Tshachhu* (Sarpang), Dungmang *Tshachhu* (Zhemgang), Dhur *Tshachhu* (Bumthang), and Chubu *Tshachhu* (Punakha), which are culturally significant and valued for their therapeutic properties. These springs are also believed to support diverse microbial communities, though this remains under-researched.

Groundwater: Groundwater resources in Bhutan remain largely unexplored. However, regions such as Paro, Punakha, and Thimphu, along with low-lying districts like Samtse, Phuentsholing, Sarpang, and Samdrup Jongkhar, are believed to hold potential groundwater reserves. Despite this, systematic assessments and monitoring remain limited.

Marshlands: Marshlands are another critical freshwater ecosystems in Bhutan, providing essential habitat for a wide variety of flora and fauna, including endemic and globally threatened species. The country has designated three Ramsar sites, namely Gangtey-Phobji, Khotokha and Bumdeling, collectively covering an area of approximately 1,225 hectares (ha) to conserve the ecologically important wetlands with diverse biodiversity and as wintering grounds for the Near Threatened black-necked crane (*Grus nigricollis*) (Birdlife International, 2025).

Gangtey-Phobji
Located in Wangdue Phodrang *Dzongkhag*, this is the largest marshland in Bhutan, covering an area of 970 ha.

Bumdeling
Situated in Trashiyangtse *Dzongkhag*, it is the second largest marshland in the country, with a total area of 141.5 ha.

Khotokha
Also located in Wangdue Phodrang *Dzongkhag*, this wetland spans 113.5 ha, making it the third largest marshland in Bhutan.

III. AGRICULTURAL ECOSYSTEM

Agriculture and livestock farming remain central to Bhutan's rural economy, food security, and cultural identity. Alongside forestry, these primary sectors contribute 14.96% to the gross domestic product (GDP) (NSB, 2024a) and employ 41.7% of the national workforce (NSB, 2024b), making them key drivers of both rural livelihoods and landscape-level biodiversity management.

Bhutan's six agro-ecological zones, shaped by distinct altitudinal and climatic gradients, support a diverse range of farming systems (see Figure 1). Cultivated land comprises approximately 2.96% of the country's total geographical area (NLCS, 2020), including *Chhuzhing* (irrigated paddy), *Kamzhing* (dryland farming), and horticultural areas such as orchards and plantations. Commonly cultivated crops include paddy, maize, potato, citrus, apple, areca nut, and cardamom, with crop selection varying by elevation and region.

Livestock plays a vital role in Bhutanese farming systems, especially in highland and semi-nomadic communities. As of 2023, the national herd included 222,597 cattle, 819,335 poultry, 29,699 yaks, 29,625 pigs, 10,117 equines, and 9,411 sheep (NSB, 2023; NSB, 2024c). Beyond their economic importance, animals such as yaks, horses, and cattle hold deep spiritual and cultural value, particularly in traditional ceremonies and rural festivals.

Photo: Rice panicle (Courtesy: DoA)

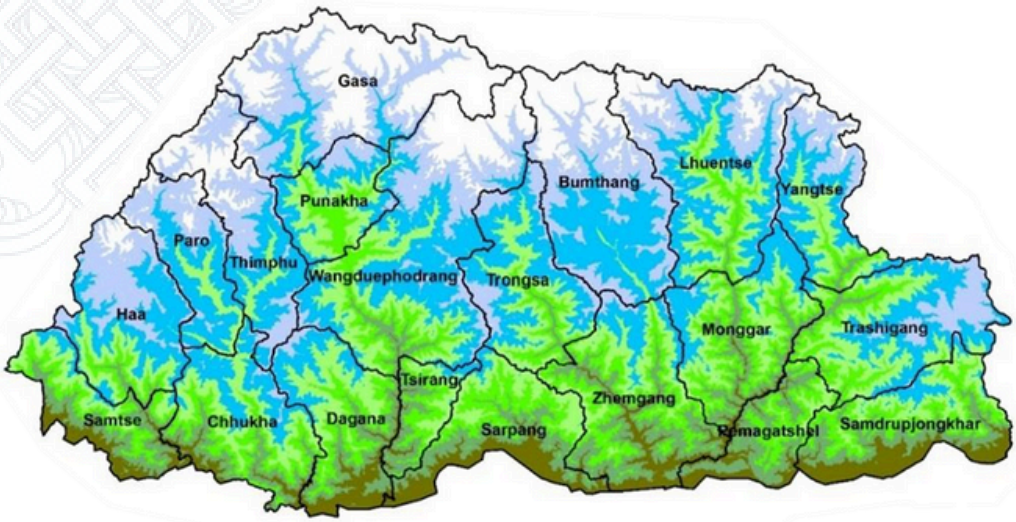


Figure 1. Map illustrating the six agroecological zones of Bhutan
Source: Adapted from Katwal & Bazile (2020).

Legends	Agroecological Zone	Altitude (masl)	Annual Rainfall	Area (%)	Farming Systems, Major Crops, and Agriculture Produce
	Alpine	3600-7500	< 650	28.6	Yak herding, rangeland
	Cool Temperate	2600-3600	650-850	23.9	Yak, dairy, sheep, horse, dairy products, pasture, barley, wheat and potatoes on dryland, buckwheat and mustard, temperate fruits and vegetables.
	Warm Temperate	1800-2600	650-850	18.6	Dairy, piggery, poultry farming, rice on irrigated land, double cropping with wheat and mustard, barley and potatoes on dryland, temperate fruit trees, and vegetables.
	Dry Sub-tropical	1200-1800	850-1200	13.1	Dairy, piggery and poultry faring, maize, rice, millet, pulses, fruit trees and vegetables, wild and lemongrass.
	Humid Sub-tropical	600-1200	1200-2500	10.3	Diary, piggery and poultry, irrigated rice rotated with mustard, wheat, pulses, vegetables, and tropical fruit trees.
	Wet Sub-tropical	150-600	2500-5500	5.6	Diary, piggery, poultry and aquaculture, irrigated rice rotated with mustard, wheat, pulses, and vegetables, and subtropical fruit trees.

Table 1. The six agroecological zones of Bhutan, categorized by altitude range, annual rainfall, land coverage, and dominant farming systems.
Source: Adapted from Katwal & Bazile (2020).

B. SPECIES DIVERSITY

I. WILD SPECIES DIVERSITY

a. PLANTS

Bhutan's diverse ecosystems and eco-floristic zones support a rich array of vascular plant species such as tree, shrubs, herbs and ferns and allies, many of which are endemic or regionally significant. The country is home to over 5,390 species of seed plants, of which approximately 98% are native (NBC, 2019). This botanical wealth plays a vital role in maintaining ecosystem functioning, supporting rural livelihoods, and sustaining traditional knowledge systems.

More than 200 plant species are currently used in Bhutanese traditional medicine, reflecting the close interdependence between biodiversity, health, and cultural heritage (Nepal, 2022). Bhutan also hosts over 710 documented tree species (FMID, 2023), contributing to the country's forest structure, ecological resilience, and climate regulation.

Photo: Jetsun's Spathoglottis (*Spathoglottis jetsuniae)*
(Courtesy: Kezang Tobgay)

Bhutan is also believed to harbour a rich diversity of non-vascular plants (mosses, liverworts, hornworts) and phytoplankton, although comprehensive inventories remain limited. To date, 282 moss species representing 156 genera have been documented (Long, 1994), and 27 phytoplankton species have been identified from a single peat bog in Bumdeling Wildlife Sanctuary (Sharma & Bhattarai, 2005). These initial findings highlight the ecological significance of lesser-known taxa and call for further research, particularly for groups essential to soil stability, nutrient cycling, and aquatic ecosystem productivity.

Photo: Mosses (Courtesy: Tshering Tobgay)

b. MAMMALS

Bhutan has recorded 129 mammal species (NBC, 2019), representing over 11% of the country's total vertebrate diversity and about 1.99% of global mammalian diversity. This includes several globally iconic and ecologically significant species such as the Royal Bengal Tiger (*Panthera tigris tigris*), Snow Leopard (*Panthera uncia*), Asian Elephant (*Elephas maximus*), Asiatic Black Bear (*Ursus thibetanus*), Red Panda (*Ailurus fulgens*), and Golden Langur (*Trachypithecus geei*). Bhutan is also recognized as a hotspot for wild felids, with overlapping ranges of multiple big cat species. Remarkably, tigers and snow leopards have been documented coexisting in the same landscape (Tempa et al., 2013; Dendup & Lham, 2023), a rare ecological phenomenon globally.

Recent surveys have further expanded Bhutan's known mammalian diversity, with five newly recorded species: the Mountain Weasel (*Mustela altaica*), Chinese Ferret Badger (*Melogale moschata*), Bearcat (*Arctictis binturong*), Asian Small-clawed Otter (*Aonyx cinereus*), and the Bhutan giant flying squirrel (*Petaurista nobilis*) (Gyeltshen et al., 2024). These discoveries highlight the country's ongoing importance as a reservoir of mammalian biodiversity in the Eastern Himalayas.

Photo: Himalayan Blue Sheep (*Pseudois nayaur*)
(Courtesy: Rinzin Wangchuk)

c. AVIFAUNA

Bhutan is globally recognized for its avian richness and is part of the Eastern Himalayan Endemic Bird Area, one of the most biologically diverse regions in the world. The country hosts a mix of resident and migratory bird species, many of which are linked to the Central Asian Flyway, including several transboundary waterbirds that rely on Bhutan's intact wetland and riverine ecosystems.

To date, 736 bird species have been recorded in Bhutan, including species with limited global distribution and several that are globally threatened (NBC, 2019). This includes four Critically Endangered, four Endangered, and 22 Vulnerable species, according to global conservation assessments. Among the most imperiled are the White-bellied Heron (*Ardea insignis*) and the Pallas's Fish Eagle (*Haliaeetus leucoryphus*), both of which are heavily dependent on pristine Himalayan freshwater ecosystems.

Bhutan's commitment to avian conservation is further demonstrated by the identification of 23 Important Bird and Biodiversity Areas (IBAs) across the country. The Jigme Dorji National Park, the largest of these, spans over 3,900 sq. km and provides critical habitat for numerous threatened species (BirdLife International, 2025). Protecting these habitats is essential not only for bird conservation but also for maintaining broader ecosystem integrity.

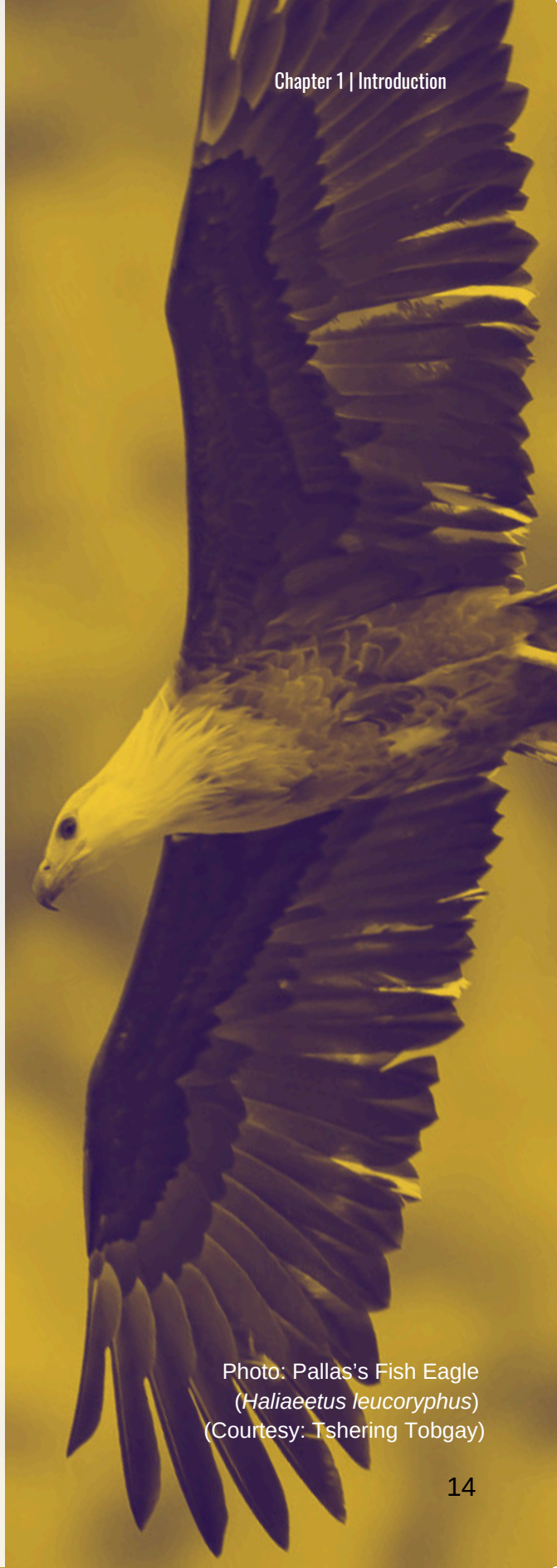


Photo: Pallas's Fish Eagle (*Haliaeetus leucoryphus*) (Courtesy: Tshering Tobgay)

d. HERPETOFAUNA

Amphibians and reptiles form an essential part of Bhutan's biodiversity, contributing to ecosystem health through pest control, nutrient cycling, and their role as bioindicators. As of 2019, approximately 158 species have been documented (NBC, 2019), although ongoing discoveries, particularly in underexplored lowland and eastern regions, suggest the actual diversity may be higher.

Despite their ecological importance, amphibians and reptiles remain among the least studied vertebrate groups in Bhutan. The International Union for Conservation of Nature (IUCN) Red List identifies 4 species as Critically Endangered, 4 as Endangered, and 7 as Vulnerable, underscoring the urgent need for targeted research and conservation efforts.

Photo: Leibig's Mountain Frog (*Nanorana liebigii)*
(Courtesy: Bhakta Ghalley)

e. FISH FAUNA

Bhutan harbors a rich diversity of freshwater ichthyofauna, with 125 species documented to date (NBC, 2019). According to the IUCN Red List, six of these species are classified as Vulnerable and one as Endangered.

Among them, the Golden Mahseer (*Tor putitora*) holds exceptional conservation and cultural value. Recognized as one of the Eight Auspicious Symbols, it is also promoted as a flagship species for high-end recreational fishing under regulated eco-tourism initiatives that support biodiversity conservation and local livelihoods. Another species of significance is the Snow Trout (*Schizothorax richardsonii*), which plays a central role in community-based capture fisheries and is sustainably harvested in selected regions of the country.

Photo: Golden Mahseer (*Tor putitora*)
(Courtesy: Fisheries Conservation Foundation)

Photo: Stripe-necked Tiger Beetle (*Cicindela virgula*) (Courtesy: Phuentsho)

f. INVERTEBRATES

Invertebrates form an essential yet often underrepresented component of Bhutan's biodiversity, playing crucial roles in maintaining ecological processes. These species contribute significantly to pollination, pest regulation, nutrient cycling, soil aeration, and broader ecosystem functioning, despite receiving limited attention in mainstream conservation efforts.

As of 2019, 455 non-insect invertebrate species have been documented in Bhutan (NBC, 2019), spanning diverse taxa such as spiders, crabs, mites, snails, slugs, and nematodes. Insects, as a major group within Arthropoda, exhibit remarkable taxonomic richness, with 3,511 recorded species across 16 taxonomic groups (NBC, 2019). The most species-rich insect orders include Lepidoptera with 1,115 species of moths and 750 species of butterflies, and Coleoptera (beetles), with 871 species.

Despite their high ecological and functional value, invertebrates remain under-assessed and are largely absent from national conservation assessments, strategies, and action plans.

g. FUNGI

Bhutan hosts at least 746 species of fungi, including insect-associated fungi, which is only about 5% of the total diversity (NMC, pers.com, 2025). The actual diversity is likely to be significantly higher due to the country's varied climatic zones, altitudinal gradients, and rich assemblage of host flora and fauna. Among these, the Caterpillar Fungus (*Ophiocordyceps sinensis*), locally known as *Yartsa Goenbub*[2], holds exceptional economic and cultural significance. This entomopathogenic fungus parasitizes ghost moth larvae and is predominantly found in alpine meadows between 3,000 and 5,000 metres (Sharma & Chettri, 2005). Highly valued in traditional medicine across the Himalayan region, it plays a vital role in rural livelihoods.

Currently, more than 4500 mushroom specimens are curated in national collections, many of which remain unidentified and await confirmation through molecular analysis. This suggests that the number of mushroom species in Bhutan is expected to increase with further research and taxonomic resolution.

Photo: Orange Pore Fungus (*Favolaschia calocera)* (Courtesy: Phuentsho)

2. Literally meaning "summer grass, winter worm" in Dzongkha.

Photo: Tree lungwort (*Lobaria pulmonaria*)
(Courtesy: Sangay Gyeltshen)

h. LICHENS, PROTISTS, AND EUBACTERIA

Lichens are important indicators of ecosystem health. To date, approximately 280 species of lichens and lichenicolous fungi have been recorded in the country (NBC, 2019).

Protists, a diverse group of eukaryotic organisms that includes amoebae, algae, and slime molds, remain largely unexplored in Bhutan.

Similarly, **bacteria**, single-celled prokaryotic microorganisms, are an essential yet underrepresented group in Bhutan's documented biodiversity. Current records indicate the presence of only 18 species (NBC, 2019).

Photo: Traditional Cereal Crops (Courtesy: Thukten Sherab)

II. AGROBIODIVERSITY

Bhutan has over 116 species of agricultural crops, encompassing a wide range of plant types including cereals and pseudo-cereals, vegetables and legumes, fruits, root and tuber crops, plantation and stimulant crops, spices, and oilseeds (GBIS, 2025). These species exhibit high intra-specific genetic diversity, with traditional landraces playing a critical role in local adaptation and cultural food systems.

The National Plant Genebank, housed at the NBC, conserves a wide array of traditional landraces, including 429 of rice, 151 of maize, 86 of finger millet, 62 of sweet buckwheat, and others. These genetic resources are safeguarded for long-term conservation, research, and crop improvement. Complementing this, on-farm conservation initiatives support community seed systems and help minimize the risk of local variety loss, ensuring that agrobiodiversity continues to contribute to food and nutritional security.

In terms of crop wild relatives (CWRs), approximately 230 species from 120 genera and 51 families have been documented in Bhutan (Tamang, 2003). Notable examples include *Fagopyrum cymosum* (wild buckwheat) and *Setaria viridis* (wild foxtail millet). Additionally, three wild relatives of rice, *Oryza minuta*, *Oryza rufipogon*, and *Oryza officinalis*, have been reported, with *O. officinalis* first recorded from southern Bhutan in 2012 (NBC, 2013). These CWRs are important genetic reservoirs for traits such as climate resilience, pest resistance, and yield stability.

Bhutan is widely recognized for its rich diversity in horticultural crops, both at the species and genetic levels. To enhance crop productivity, resilience and food and nutritional security, the Ministry of Agriculture and Livestock (MoAL) has released a total of 59 improved field crop varieties, 254 horticultural crop varieties and 31 forage crop varieties (DoA, 2023).

Photo: Apple (Courtesy: Karma C. Nyedrup)

Photo: Yak (*Bos grunniens*) (Courtesy: Towchu Rabgay)

b. LIVESTOCK

Bhutan's native livestock breeds represent a critical component of the country's biodiversity and rural livelihood systems. These breeds reared across diverse agro-ecological zones are highly adapted to local environments and contribute significantly to household nutrition, income, and traditional culture (IALC, 2023).

Among the key native livestock breeds is the *Nublang-Thrabum*, a multi-purpose *Bos indicus* cattle valued for both milk and draught power. In the sub-tropical and temperate forests, the *Mithun* (*Bos frontalis*) plays an important role in local economies and crossbreeding to produce *Jatsha* (male) and *Jatsham* (female). Highlanders rely heavily on the Yak (*Bos grunniens*) for milk, fibre, and transportation. Local types of Buffalo (*Bubalus bubalis*), such as *Kagay, Hyakulae,* and *Dobla*, support wetland agriculture in the southern regions.

Bhutan also maintains a wide variety of native poultry breeds, including *Seim, Yuebjha Naap, Yuebjha Kaap, Naked neck, Barred, Belochem, Pulom, Bobthra,* and *Kauray*. The native pig breeds such as *Dompha, Saphag,* and *Jituphap* remain culturally significant and nutritionally important. Native sheep breeds such as *Jakar, Sakteng,* and *Sipsoo* as well as goat, are maintained locally for meat and fibre. Native horse breeds including *Yuta, Boeta,* and *Sharta* are used for transportation. The germplasm of these breeds are preserved at the National Animal Genebank at NBC for longterm conservation and research (NBC, 2019).

Photo Courtesy: Kezang Tobgay, Gopal Prasad Khanal, Karma C. Nyedrup, and Sonam Tobgay

1.4 VALUES OF BIODIVERSITY AND ECOSYSTEMS

Bhutan is a predominantly agrarian society where biodiversity forms the foundation of people's livelihoods, traditions, and spiritual beliefs. Communities maintain deep economic, ecological, and cultural connections with nature, evident in age-old practices such as the use of *Dru Na Ghu*[3] (nine different cereals) in religious rituals and the reverence of sacred natural sites.

Biodiversity underpins a wide range of daily needs, providing food, fuel, water, shelter, medicine, fibre, household materials, and raw inputs for traditional crafts and cultural ceremonies. This dependence is especially pronounced in rural areas, where biodiversity and ecosystem services are critical to wellbeing and resilience.

A preliminary study estimates that Bhutan's forests alone generate ecosystem services valued at approximately USD 15.5 billion annually, underscoring the immense, yet often overlooked, contribution of nature to the country's economy and society (Kubiszewski et al., 2013).

3. A traditional offering of nine types of cereals used in Bhutanese religious ceremonies.

FUELWOOD, TIMBER, AND NWFP

Despite achieving 99.7% household electrification, firewood continues to be used as a source of energy in many rural areas of Bhutan. For instance, between 2012 and 2022, around 1,139,810 cubic metres (m^3) of fuelwood were supplied. In 2022, alone, a total of 99,307.23 m^3 fuelwood were supplied of which, household consumption accounted for about 28.81% and industrial consumption about 71.19% (NSB, 2023).

Timber is another key forest commodity, extensively used for housing, public infrastructure, and commercial purposes. From 2015 to 2022, Bhutan extracted nearly 54 million cubic feet (cft) of timber, including 20 million cft for commercial use and 34 million cft supplied under concessional schemes (NSB, 2023).

Non-Wood Forest Products (NWFPs) also play a vital role in rural livelihoods and biodiversity-based economies (FMID, 2025). As of 2024, 141 NWFP management groups comprising 5,922 households were actively engaged in harvesting and managing products such as mushrooms, medicinal plants, and lemongrass. In the same year, NWFP royalty[4] revenues amounted to Nu. 4.50 million (FMID, 2025), reflecting their growing contribution to local incomes.

HYDROPOWER

Hydropower remains a major driver of Bhutan's economic growth. The country is endowed with significant renewable energy potential, including an estimated 33,000 megawatts (MW) of techno-economically viable hydropower, 12,000 MW of solar, and 800 MW of wind resources (DoE, 2023). As of 2023, Bhutan's total installed hydropower capacity was 2,452 MW, equivalent to 7.5% of its total hydropower potential, with all electricity generation derived from green and renewable sources (DoE, 2023). The hydropower sector contributed Nu. 23 billion to the national economy in 2023 (Business Bhutan, 2023).

The long-term sustainability of the hydropower sector is closely tied to the health of Bhutan's upstream ecosystems. Watershed degradation, sedimentation, and shifting rainfall patterns linked to climate change pose growing risks to infrastructure and energy production (IRENA, 2020).

4. A fee paid to the government for the legal right to harvest and sell natural resources

TOURISM

Tourism is a major contributor to Bhutan's economy, drawing heavily from the country's rich biodiversity and pristine environment. As of 2019, the sector contributed 10% to the country's GDP, generating over USD 345 million in receipts and supporting approximately 52,000 jobs across 7,000 tourism-related establishments (DoT, 2025). Bhutan's "High Value, Low Volume" tourism policy is designed to minimize cultural and environmental impacts while maximizing socio-economic benefits (RGoB, 2019).

Protected areas, biological corridors, and high-altitude wetlands serve as key attractions for nature-based tourism. The government has promoted ecotourism initiatives such as high-end fly-fishing, birdwatching, trekking, and community-based homestays that create economic opportunities while encouraging local conservation efforts.

As the tourism sector grows, ensuring alignment with ecosystem carrying capacities and implementing robust biodiversity safeguards will be vital for preserving Bhutan's ecological integrity and the long-term sustainability of the industry.

Photo: Tourists hiking (Courtesy: Sonam Tobgay)

1.5 POLICIES AND LEGAL FRAMEWORK RELATED TO BIODIVERSITY

The Article 5.1 of the Constitution of the Kingdom of Bhutan 2008 states that "Every Bhutanese is a trustee of the Kingdom's natural resources and environment". The government is entrusted to conserve and improve the environment and safeguard the country's sacred biodiversity. It is further directed to secure sustainable development while promoting economic and social development through visionary policy guidelines and strategic action plans. The following are the relevant policies and legislations related to the biodiversity conservation.

BIODIVERSITY RELATED POLICIES

I. Food and Nutrition Security Policy of Bhutan 2023: Promotes conservation and sustainable use of agricultural biodiversity including CWRs, livestock and associated traditional knowledge as a tool for building sustainable and resilient farming system.

I**I. Climate Change Policy of the Kingdom of Bhutan 2020**: Aims to provide strategic guidance to ensure that Bhutan remains carbon neutral and protects the wellbeing of the people by adapting to climate change. It also ensures that challenges and opportunities of climate change are addressed at all appropriate levels, through adequate means of implementation and integration into relevant plans and policies.

III. National Gender Equality Policy 2020: Reaffirms the commitment of the Royal Government to ensure achievement of substantive equality through gender-responsive policies, plans and programs.

IV. Tourism Policy of the Kingdom of Bhutan 2019: Follows a unique sustainable approach of High Value, Low Volume to ensure a cautious tourism sector growth.

V. Economic Development Policy of the Kingdom of Bhutan 2016: Leverages environmental conservation as a driver for economic growth under the "Brand Bhutan" initiative, promoting a green economy aligned with GNH.

VI. Access and Benefit Sharing Policy of Bhutan 2015: Ensures conservation and sustainable use of Bhutan's biological heritage through securing the economic, social and spiritual wellbeing of the Bhutanese people. It also ensures equitable sharing of benefits in line with the Nagoya Protocol.

VII. National Forest Policy of Bhutan 2011: Focuses on sustainable management of forest resources to maintain biodiversity and comply with mandate to maintain 60% of the forest cover at all times to come as enshrined in the Constitution of the Kingdom of Bhutan 2008.

VIII. Biosecurity Policy of the Kingdom of Bhutan 2010: Contributes to achieving GNH by ensuring Bhutanese people, the biological resources, plants and animas are protected from harmful effects of pests and diseases, invasive alien species, genetically modified organisms (GMOs), toxic chemicals and food additives.

I**X. Bhutan Water Vision and Bhutan Water Policy 2008**: Emphasizes the sustainable management of water resources to support national development and disaster resilience.

BIODIVERSITY RELATED LEGISLATIONS

I. Forest and Nature Conservation Act of Bhutan 2023: Focuses on the protection and sustainable use of forests, wildlife, and natural resources.

II. Biodiversity Act of Bhutan 2022: Promotes conservation and sustainable use of biological resources and secures the value of Bhutan's biological resources and associated traditional knowledge. It also regulates access to genetic resources and associated traditional knowledge for research and commercial utilization.

III. Biosafety Act of Bhutan 2015: Aligns with the Cartagena Protocol to manage risks associated with living modified organisms (LMOs) and to protect biodiversity, health of animals and humans, and the environment.

IV. The Water Act of Bhutan 2011: Ensures that the water resources are protected, conserved and/or managed in an economically efficient, socially equitable and environmentally sustainable manner.

V. Waste Prevention and Management Act of Bhutan 2009: Aims to protect human health and environment through reducing generation of waste at source, promoting segregation, reuse and recycling of wastes and disposal of waste in an environmentally sound manner.

VI. National Environment Protection Act of Bhutan 2007: Provides for the establishment of an effective system to conserve and protect environment through the NEC or its successors, designation of competent authorities and constitution of other advisory committees, so as to independently regulate and promote sustainable development in an equitable manner.

VII. The Land Act of Bhutan 2007: Integrates environmental considerations into land management, promoting sustainable resource use.

VIII. The Livestock Act of Bhutan 2001: Regulates livestock breeding, health and production to enhance animal productivity and rural livelihoods.

IX. Environment Assessment Act 2000: Establishes procedures for the assessment of potential effects of strategic plans, policies, and programs and projects on the environment, and for the determination of policies and measures to reduce potential adverse effects to promote environmental benefits.

X. The Seeds Act of Bhutan 2000: Regulates agricultural seed management and promotes rural livelihoods.

XI. The Pesticide Act of Bhutan 2000: Ensures the safe use of pesticides and integrates pest management strategies.

XII. The Plant Quarantine Act of Bhutan 1993: Prevents the introduction of harmful pests and controls existing pest populations.

1.6 INTERNATIONAL COOPERATION FOR BIODIVERSITY CONSERVATION

With Bhutan's strong environmental conservation history and commitment to the global conservation goals, it is party to 19 regional and international environmental agreements and treaties as of now.

Table 2. List of regional and international environmental agreements and treaties acceded to by Bhutan (as of 2025)

Sl. No.	Treaties/Agreements	Year of Ratification
1	Kigali Amendment to the Montreal Protocol	September 2019
2	Paris Agreement	September 2017
3	The Nagoya Protocol on Access and Benefit Sharing	September 2013
4	Ramsar Convention on Wetlands	January 2012
5	Vienna Convention for the Protection of the Ozone Layer	August 2004
6	Montreal Protocol on Substances that Deplete Ozone Layer	August 2004
7	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation	February 2004
8	International Treaty on Plant Genetic Resource for Food and Agriculture	September 2003
9	Cartegena Protocol on Biosafety	September 2003

Sl. No.	Treaties/Agreements	Year of Ratification
10	UN Convention to Combat Desertification	August 2003
11	Convention on International Trade in Endangered Species of Wild Fauna and Flora	August 2002
12	UNESCO World Heritage Convention	August 2002
13	Basel Convention on Hazardous Wastes	August 2002
14	Global Environment Facility	December 1995
15	UN Convention on Biological Diversity	August 1995
16	UN Framework Convention on Climate Change	August 1995
17	International Plant Protection Convention	June 1994
18	South Asian Association for Regional Cooperation	December 1985
19	South Asia Co-operative Environment Programme	1982

1.7 EXISTING INSTITUTIONAL ARRANGEMENT

The MoAL is taking the lead role in coordinating the development and implementation of the NBSAP in the country. The following Departments and agencies implement various biodiversity programs, including programmes of work on thematic and cross-cutting issues of the CBD as reflected below:

GOVERNMENT AGENCIES

NATIONAL BIODIVERSITY CENTRE

Coordinates and implements biodiversity conservation and sustainable utilization programs in the country. It is the National Focal Point for the Nagoya Protocol and Secretariat for NBSAP.

DEPARTMENT OF AGRICULTURE

Enhances food security and income through improved crop and plant management, supported by better market access, inputs, infrastructure, and sustainable practices.

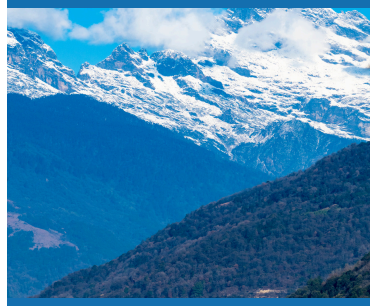
DEPARTMENT OF LIVESTOCK

Coordinates livestock production, quality input supply, and animal health services, ensuring food and nutrition security.

DEPARTMENT OF FORESTS & PARK SERVICES

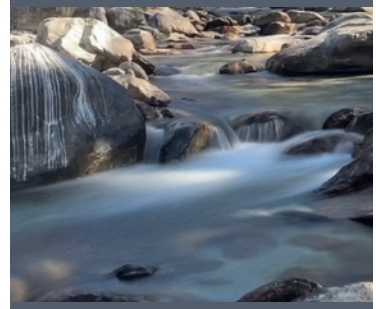
Conserves and manages Bhutan's forest biological resources to ensure socio-economic and environmental wellbeing, with a minimum of 60% of the land under forest cover for all times to come.

DEPARTMENT OF ENVIRONMENT & CLIMATE CHANGE



Implements policies, regulations, and monitors the state of environment and provides guidance to achieve environment protection.

DEPARTMENT OF WATER



Ensures safe, affordable, accessible, and sustainable water resources through adaptive and integrated management, supporting national wellbeing and ecosystem integrity.

DEPARTMENT OF ENERGY

Ensures energy security for economic prosperity, social progress and the well being of people.

DEPARTMENT OF TOURISM

Promotes Bhutan as an exclusive travel destination based on Gross National Happiness (GNH) Values.

BHUTAN FOOD & DRUG AUTHORITY

Ensures quality and safety of food, agricultural and medical products. It regulates controlled substances, GMOs, and enforces plant and animal biosecurity measures. It is the National Focal Point for the Cartagena Protocol.

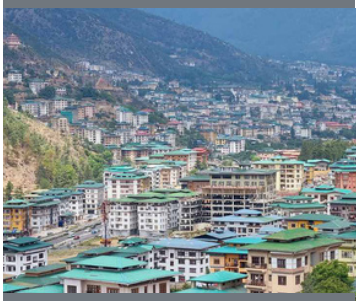
DEPARTMENT OF LOCAL GOVERNANCE & DISASTER MANAGEMENT

Oversees Local Governments by coordinating social, economic, and political affairs including ground-level programs and initiatives.

DEPARTMENT OF EDUCATION PROGRAMMES (WOMEN AND CHILDREN DIVISION)

Oversees policy and legislative development, regulatory and monitoring functions, evaluating the integration of gender and child perspectives into sectoral plans and policies.

DEPARTMENT OF HUMAN SETTLEMENT



Promotes safe, secure, and responsive human settlements through planning strategies and physical development plans aligned with national development policies.

NATIONAL LAND COMMISSION SECRETARIAT

Ensures efficient, transparent, and sustainable land governance through the implementation of ICT-enabled land administration, evidence-based planning, optimal land use, and reliable geospatial data management.

NATIONAL STATISTICS BUREAU

The central authority for collecting, compiling, and disseminating official data. It supports evidence-based decision-making and planning across sectors, including the environment.

NON-GOVERNMENT AGENCIES/CHARTERED ORGANIZATIONS

BHUTAN TRUST FUND	BHUTAN FOR LIFE FUND SECRETARIAT	ROYAL SOCIETY FOR PROTECTION OF NATURE	TARAYANA FOUNDATION
Finances conservation through research, sustainable livelihoods, and climate adaptation. It is the world's first environmental trust fund.	Secures long-term funding for Protected Areas and climate resilience. It is Asia's first Project Finance for Permanence (PFP) model.	Conserves Bhutan's environment through citizen engagement. It focuses on species, wetlands, education, waste, livelihoods, and climate resilience.	Improves rural livelihoods through holistic development. It empowers vulnerable communities for self-sufficiency.

BHUTAN ECOLOGICAL SOCIETY	WORLD WILDLIFE FUND - BHUTAN	BHUTAN FOUNDATION
Advances environmental sustainability through science, research and advocacy.	Supports in conserving biodiversity and promoting sustainable development in line with the country's environmental vision.	Supports in implementing projects related to socioeconomic development including biodiversity conservation.

1.8 REVIEW OF PAST NBSAP

To review the progress and status of the NBSAP 2014, several rounds of consultations were carried out. Participants included TWG members representing government agencies, non-government organizations, private sectors, and other relevant stakeholders.

Each target's progress was categorized into one of three classes with assignment of weightage: "Achieved (100%)," "Not Achieved (0%)," and "Partially Achieved (further ranked in the categories of 25%, 50%, and 75%)".

The highest score was 93.8% for National Target 16, i.e., By 2015, the Nagoya Protocol is implemented through national Access and Benefit Sharing (ABS) legislative, administrative and institutional frameworks, which are consistent with the Nagoya Protocol (See figure 2).

Conversely, the lowest achievement score was 35% for National Target 9, i.e., By 2020, invasive alien species (IAS) and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

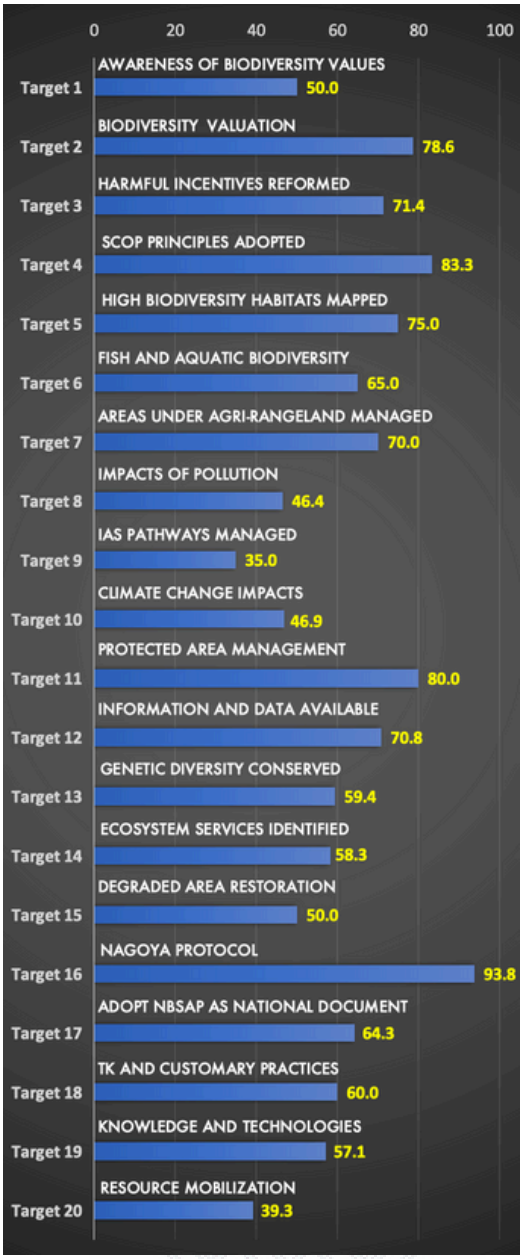


Figure 2. Percentage achievement score of each target. The results were shaped by available evidence and therefore may be subjective. Percent scores ranged from 93.8-35% (average = 62.73 %).

KEY LESSONS FROM NBSAP 2014

1. Inadequate Policy Integration and Legislative Gaps

- Absence coordination mechanism and national guidelines to manage IAS.
- Poor integration of ecosystem-based adaptation into national strategies, leading to fragmented implementation of climate-resilient solutions.
- Limited criteria and frameworks for species prioritization, conservation status evaluation, and identification of degraded ecosystems, especially aquatic systems.
- Weak alignment of NBSAP targets with national development plans such as the Five-Year Plan (FYP), and absence of biodiversity mainstreaming into other sectoral policies and strategies.
- Lack of a national master plan for environmental education and limited incorporation of biodiversity values into national economic planning.

2. Weak Institutional Coordination and Governance

- No formal national coordination mechanism was instituted, leading to fragmented implementation across agencies.
- Absence of a Monitoring and Evaluation (M&E) unit within the NBSAP secretariat hindered oversight and performance tracking.
- Lack of a lead agency for aquatic biodiversity conservation and poor inter-agency synchronization in related assessments.
- Environmental-economic accounting remains underdeveloped due to institutional and data integration gaps.

3. Gaps in Education, Awareness, and Community Engagement

- Although awareness programs were implemented, lack of evaluation and impact assessments limited understanding of their effectiveness.
- Limited coordination among agencies engaged in environmental education.
- Biodiversity-rich farming systems remain unidentified and under-assessed, and community engagement has been narrowly focused on forest-based interventions.

4. Capacity Constraints

- Capacity needs assessments were incomplete, particularly in areas such as agro-biodiversity, sustainable transport, and valuation of biodiversity and ecosystem services.

- Limited infrastructure and technical expertise for ex-situ conservation, forensic analysis, and microbial biodiversity documentation.

5. Incomplete Habitat and Ecosystem Monitoring

- Habitat mapping has predominantly focused on terrestrial megafauna, overlooking aquatic ecosystems and less charismatic biodiversity.
- Biodiversity trend data remain unclear within protected areas, especially for agro- and aquatic biodiversity components.

6. Insufficient Sustainable Resource Management

- Although forest and protected areas have been brought under sustainable management regimes, several forest units still lack biodiversity-inclusive plans.
- Monitoring and adaptive management mechanisms remain weak or partially implemented.

7. Environmental Standards and Compliance

- Environmental regulations lack robust compliance monitoring, and documentation of pollution sources and impacts remains inadequate.

8. Climate Change Adaptation Measures Remain Limited

- Climate data infrastructure does not support long-term monitoring.
- Ecosystem-based adaptation initiatives have been selective and limited to certain habitats.

9. Conservation Financing Deficiencies

- A dedicated funding mechanism within BTFEC for NBSAP implementation was never established.
- Reducing Emissions from Deforestation and Degradation (REDD+) strategies were formulated without securing financial commitments.
- Payment for Ecosystem Services (PES) were piloted only in the water sector.

10. Incomplete Technology Transfer and Adoption

- Although technologies for human-wildlife conflict and forest fire management exist, institutional mechanisms to scale up and replicate them are lacking.
- Limited progress in mobilizing resources or establishing a national plan for funding and technology transfer, despite clear intent in the NBSAP.

11. Gender Mainstreaming

- Inclusive gender perspectives was not adequately featured in the NBSAP 2014.

CONCLUSION AND SYNTHESIS

Bhutan's rich biodiversity, shaped by its unique geography, diverse ecosystems, and strong cultural values, remains central to the country's development vision and identity. From the earliest conservation policies of the 1950s to the landmark establishment of protected areas and biological corridors, Bhutan's commitment to safeguarding nature has been deliberate and sustained. The country's status as part of the Eastern Himalayan Biodiversity Hotspot, with high levels of species endemism and habitat integrity, underscores its global ecological importance.

Biodiversity in Bhutan is not only a foundation for ecological resilience but also deeply embedded in the lives and livelihoods of its people. Forests, freshwater systems, agricultural landscapes, and highland pastures provide critical services that support food security, energy generation, cultural heritage, and economic sectors such as tourism and hydropower. These links are especially visible in rural communities, where traditional knowledge and spiritual reverence for nature guide daily practices.
A robust institutional architecture has evolved over time, comprising specialized agencies, legal frameworks, and policy instruments that promote biodiversity governance at all levels. However, emerging challenges such as climate change, land-use pressures, invasive species, and shifting socio-economic dynamics call for adaptive and inclusive approaches.

This chapter highlights the imperative of integrating biodiversity values into national planning and decision-making. It sets the stage for the next chapters, which outline threats to biodiversity.

CHAPTER 2

THREATS TO BIODIVERSITY

This chapter outlines the key direct and indirect drivers of biodiversity loss in Bhutan.

2.1 DIRECT THREATS

A. LAND USE CONVERSION

Bhutan's economic growth, projected at 6.6% for FY 2024–2025, has been fueled by expanding sectors such as mining, manufacturing, commercial agriculture, and infrastructure development (World Bank, 2024). While essential for national progress, these trends are exerting pressure on the country's natural ecosystems.

Land conversion is accelerating, with 3,273.79 ha of State Reserved Forest Land allocated in 2023 alone for roads, power transmission lines, industrial estates, and settlements (FMID, 2024). Even within protected areas, forest loss averaged approximately 4,675 ha annually between 2016 and 2022 (FMID, 2024). Projections indicate that, if current trends persist, Bhutan could experience deforestation of up to 28,800 ha per year by 2030 (Tshewang et al., 2021).

These shifts are contributing to habitat loss and fragmentation, ecosystem degradation, and biodiversity loss, particularly in ecologically sensitive and corridor-linked landscapes. This trend points to a potential disconnect between development objectives and integrated land use planning, suggesting the need to strengthen environmental safeguards and enhance cross-sectoral coordination.

Photo: Mining (Courtesy: Karma C. Nyedrup)

B. FOREST FIRE

Forest fires represent a significant pressure on forest biodiversity. Each year, substantial areas of forested land, particularly pine and oak forests, are impacted by human-induced fires, often lit to regenerate grazing areas or deter wildlife from damaging crops. Between 2020 and 2024, Bhutan recorded 261 fire incidents, affecting approximately 28,000 ha of forest (Kuensel, 21 April 2025). Fire frequency has increased significantly, with 72 incidents in 2023, nearly triple the 26 recorded in 2020 (BBS, 2025). Drier and windier conditions linked to climate change are intensifying both the scale and severity of forest fires, particularly in mid-altitude zones (Dorji & Lucero-Prisno, 2022). These events degrade soil, fragment habitats, and disrupt natural regeneration, resulting in long-term biodiversity loss and increased carbon emissions. They also challenge Bhutan's long-term goals for carbon neutrality and sustainable forest management.

Photo: Forest fire in Autsho, Lhuntse
Courtesy: Krishna Prasad Dhimal

Photo: Logging (Courtesy: Dr. Karma Dema Dorji)

C. LOGGING AND FUELWOOD

Timber is a key raw material in Bhutan's construction sector. Between 2015 and 2022, approximately 54 million cubic feet (cft) of timber were harvested, 20 million cft for commercial purposes and 34 million cft under rural and institutional concession schemes (NSB, 2023). In 2022 alone, an estimated 5.9 million cft of timber and 2.99 million cft of firewood were extracted (FMID, 2024). Although regulated through forest management plans and permit systems, extraction in high-demand areas is placing increasing pressure on natural forests. Misuse of rural permits, inadequate monitoring, and harvests exceeding sustainable yield thresholds have led to degradation in some regions (Tshewang et al., 2021). These practices compromise forest structure, reduce canopy cover, and fragment wildlife habitats, threatening both biodiversity and ecological resilience.

As timber demand continues to grow, particularly in urban and peri-urban areas, Bhutan will need to implement integrated strategies, such as stricter enforcement, restoration efforts, and promotion of alternative materials, to ensure ecological integrity is maintained alongside economic needs.

D. UNSUSTAINABLE COLLECTION OF NON-WOOD FOREST PRODUCTS

Non wood forest products (NWFPs) form a vital component of Bhutan's biodiversity-based economy, contributing to household nutrition, traditional medicine, and rural livelihoods (RGoB, 2014). A wide range of NWFPs, including wild vegetables, mushrooms, bamboo, medicinal plants, natural dyes, exudates, lemongrass, fibres, brooms, ornamentals, incense, and raw materials for handmade paper and handicrafts, are collected annually for both subsistence and commercial use (FRDD, 2006).

However, increased market demand has been observed to pressure certain wild species, particularly high-value or slow-regenerating ones. While detailed studies are limited, overharvesting may pose risks to the ecological functions these species support (FRDD, 2006). In several regions, unsustainable collection practices are contributing to habitat degradation, diminished species regeneration, and local biodiversity decline (AFoCO, 2020).

Many NWFP species are also highly sensitive to climate variability. Their growth and distribution rely on specific environmental cues, and changes in temperature and rainfall patterns have already begun affecting the productivity and availability of key species (Dorji & Lucero-Prisno III, 2022; Bhutan Foundation, 2022). The combination of ecological pressure from overharvesting and climate-induced stressors threatens the long-term sustainability of NWFP resources and the ecosystems that support them.

Photo: Caterpillar Fungus (*Ophiocordyceps sinensis*) (Courtesy: Kezang Tobgay)

Photo: Land degradation (Courtesy: Singye Wangchuk)

E. MINING AND QUARRYING

Bhutan's mining and quarrying sector has seen substantial growth in recent years, driven by rising domestic demand, expanding export markets, and enabling policy support. As of 2024, 1,566 ha, equivalent to 0.04% of the country's total land area, have been leased for mining and quarrying (Eco-Business, 2024). In 2023 alone, the sector contributed 2.20% to GDP, recorded a 35.10% growth rate, and generated Nu. 11.10 billion in mineral export value (MoICE, 2025). Between 2013 and 2022, a cumulative 38.97 million metric tons of minerals were extracted, with dolomite reserves alone estimated at 16 billion million metric tones.

While the sector's economic contribution is notable, its environmental costs are significant. Mining and quarrying activities contribute to land degradation, habitat fragmentation, soil and water contamination, air pollution, and biodiversity loss, particularly in ecologically sensitive areas, including sites near biological corridors and community-managed forests (Yakha, 2023). These impacts are often long-term and difficult to reverse, especially when rehabilitation efforts are weak or delayed. Without stronger safeguards and enforcement, the anticipated sectoral expansion is likely to intensify pressure on fragile ecosystems.

Photo: Forest patrolling (Courtesy: Tshering Choden)

F. FORESTRY OFFENCES

Illegal exploitation of forest and wildlife resources is a growing threat to Bhutan's biodiversity. In 2023, a total of 1,318 offences were recorded, up from 1,284 in 2022 (FMID, 2024). The majority were related to unauthorized timber extraction, followed by illegal harvesting of NWFPs and illegal fishing (FMID, 2024). These activities directly undermine forest integrity, deplete valuable species, and weaken ecosystem resilience.

High-value wildlife species such as Musk Deer (*Moschus chrysogaster*), Tiger (*Panthera tigris*), and Himalayan Black Bear (*Ursus thibetanus laniger*) are frequently targeted, driven by transboundary trade in wildlife derivatives used in traditional medicine (DoFPS, 2023). In addition, retaliatory killings, especially in areas of recurring human–wildlife conflict, pose further risks to species survival, particularly large carnivores such as tigers (DoFPS, 2023).

This upward trend in environmental offences signals the need for enhanced surveillance, community-centered enforcement strategies, and targeted awareness campaigns.

> **"1,318 forest offences were recorded in 2023"**

Photo: Fall Army Worm (*Spodoptera frugiperda*) (Courtesy: NPPC, DoA)

G. INVASIVE ALIEN SPECIES

Invasive Alien Species (IAS) are among the most pressing global threats to biodiversity, ecosystems, and economies. They outcompete native species, alter ecological structure and function, and have been estimated to contribute to 40% of all known animal extinctions globally (CBD, 2006). A global study analyzing over 3.4 million records found that IAS introductions are increasing exponentially, doubling approximately every 14 years, particularly in non-native regions (Seebens et al., 2017).

In Bhutan, a total of 136 alien plant species have been documented (Tshering & Rinchen, 2025), with 22 major invasive species identified through field surveys and 25 others through literature review. Alarmingly, nine of these are listed among the world's 100 worst invasive alien species. In freshwater systems, a study in the Amochhu River recorded 37 fish species, five of which were alien: *Oreochromis mossambicus*, *Cyprinus carpio*, *Ompok pabda*, *Clarias gariepinus*, and *Salmo trutta* (Norbu et al., 2020).

Despite mounting evidence of their ecological and economic impacts, Bhutan's national response to IAS remains constrained by fragmented institutional mandates, weak inter-agency coordination, and a lack of real-time data on invasion pathways, distribution, and ecological impacts.

H. HUMAN-WILDLIFE CONFLICT

Human–wildlife conflict (HWC) is a growing global concern, driven by expanding human settlements, intensified land use, and climate-induced shifts in species distribution. In Bhutan, HWC poses a serious challenge to rural livelihoods and food security, primarily through crop depredation and livestock predation in areas where people and wildlife share shrinking natural spaces.

Crop loss is the most widespread form of conflict, with farmers losing an estimated 19-43% of annual production to wildlife, depending on proximity to forest edges, crop type, and seasonality (RGoB, 2022). Recent studies report an average loss of around 30% per year. While less frequent than crop damage, livestock predation has been shown to contribute significantly to household income loss, over two-thirds in some affected areas (Wang & Macdonald, 2006). Key conflict species include wild boars, monkeys, and deer (primarily crop raiders), and larger mammals such as elephants, bears, and tigers that are often responsible for livestock predation and threats to human safety.

Beyond direct losses, households incur indirect costs such as lost labor time, increased input expenditures, and investments in physical deterrents. These impacts extend to social well-being and local economies, contributing to resentment toward conservation efforts and undermining long-term coexistence (DoFPS, 2023).

> **“19-43% of annual production of crop is lost to wildlife”**

Photo: Asian Elephant (*Elephas maximus*) (Courtesy: Kezang Tobgay)

I. POLLUTION

Bhutan, long recognized for its environmental stewardship, is facing rising pollution pressures that threaten its biodiversity and ecological integrity. Key concerns include agrochemical inputs and their runoff, industrial waste, and plastic pollution, all of which contribute to soil and water contamination and degrade both aquatic and terrestrial ecosystems.

Solid waste generation, averaging 172 metric tonnes per day (BBS, 2020), is inadequately managed, particularly in peri-urban areas where open dumping contributes to land and water pollution. The issue is compounded by limited public awareness, lack of targeted studies, and weak monitoring mechanisms. Pollution control efforts are further constrained by technical, financial, and human resource gaps, highlighting the need for stronger institutional coordination, integrated data systems, and sustained investment.

Photo: Pollution (Courtesy: Karma C. Nyedrup)

Photo: Flooding (Courtesy: Tshering Wangchuk)

2.2 INDIRECT THREATS

A. CLIMATE CHANGE AND BIODIVERSITY

Bhutan is among the few countries globally that remains carbon negative. In 2022, national greenhouse gas emissions were estimated at 1.74 million metric tonnes of CO_2 equivalent (CO_2e), while carbon sequestration by forests, croplands, and grasslands offset 11.45 million metric tonnes CO_2e (DECC, 2024). However, mitigation success does not protect Bhutan from the escalating impacts of global climate change.

The country is increasingly exposed to climate-induced hazards, including GLOFs, flash floods, forest fires, landslides, and windstorms, all intensified by its fragile mountain geography. These events pose risks not only to lives and infrastructure but also to biodiversity, fragmenting habitats, degrading ecosystems, and accelerating species loss.

Rapid warming is transforming Bhutan's alpine ecosystems. Treelines are advancing by approximately one metre per year, reducing the range of cold-adapted species and destabilizing the ecological balance of high-altitude zones. In 2024, Bhutan recorded its highest-ever temperature at 40°C (Kuensel, 2024[5]), and mosquitoes were observed as high as 4,800 masl, signaling a shift in ecological thresholds and increasing the risk of vector-borne diseases (Dorji & Lucero-Prisno III, 2022).

5. *in April 2024 in Sarpang Dzongkhag, as reported by Kuensel*

B. POVERTY

Poverty is a driver of biodiversity loss, particularly in Bhutan's rural areas where communities are heavily dependent on natural resources for their livelihoods. Economic hardship often compels households to rely on unsustainable practices such as overharvesting forest products, poaching, or land conversion, placing additional stress on ecosystems.

According to the Poverty Analysis Report 2022, 12.4% of the national population lives in poverty, with rural poverty (17.5%) significantly higher than urban poverty (4.2%). This disparity highlights the heightened vulnerability of rural landscapes to unsustainable use driven by necessity rather than choice. The Labour Force Survey 2024 further reveals that only 62% of Bhutan's working-age rural population is economically active, reflecting increased rural–urban migration in search of better services and opportunities.

This demographic shift contributes to multiple challenges: depopulated rural areas face labor shortages, abandoned farmland, and weakened land stewardship, while growing urban centers experience rising poverty, environmental degradation, and overstretched infrastructure. Around 65,000 acres of farmland are fallow, and only 45% of the employed population remains engaged in agriculture (NSB, 2024b). Wildlife-related crop losses, averaging around 30% annually, continue to discourage farming and contribute to increased dependence on extractive activities[6] (Wangchuk et al., 2023). These interconnected pressures reinforce a cycle of rural decline and biodiversity degradation.

6. Extractive activities refer to the harvesting or removal of natural resources such as timber, firewood, NWFP.

Photo: A makeshift shelter in Zhemgang (Courtesy: Nagdrel Lhamo)

CONCLUSION AND SYNTHESIS

Bhutan's biodiversity faces mounting threats from both direct and indirect drivers. Rapid land use conversion for infrastructure, agriculture, and extractive industries is accelerating habitat loss and fragmentation, even within protected areas. Forest fires, often human-induced and intensified by climate change, are becoming more frequent, degrading ecosystems and threatening carbon sinks.

Unsustainable harvesting of timber, fuelwood, and non-wood forest products, compounded by weak monitoring and regulatory gaps, is undermining forest integrity and species regeneration. Illegal logging, poaching, and overexploitation continue to rise, while invasive alien species spread unchecked due to limited coordination and biosecurity measures.

Pollution from agrochemicals, industrial discharge, and mismanaged solid waste is contaminating Bhutan's soils and water bodies, weakening ecosystem health. Climate change exacerbates these threats by altering species distributions, triggering extreme events, and degrading alpine and freshwater systems.

Poverty and rural dependence on natural resources further intensify unsustainable practices. Together, these pressures reveal critical gaps in land use planning, enforcement, and community-based stewardship.

Integrated, cross-sectoral responses, grounded in strong institutions, inclusive governance, and adaptive management, are essential to safeguard Bhutan's biodiversity and ensure a resilient, and sustainable future.

CHAPTER 3

ISSUES AND OPPORTUNITIES IN BIODIVERSITY CONSERVATION

This chapter outlines the critical challenges and emerging opportunities shaping biodiversity conservation in Bhutan. By examining current gaps, the chapter lays the foundation for targeted strategies and actions in the next chapter.

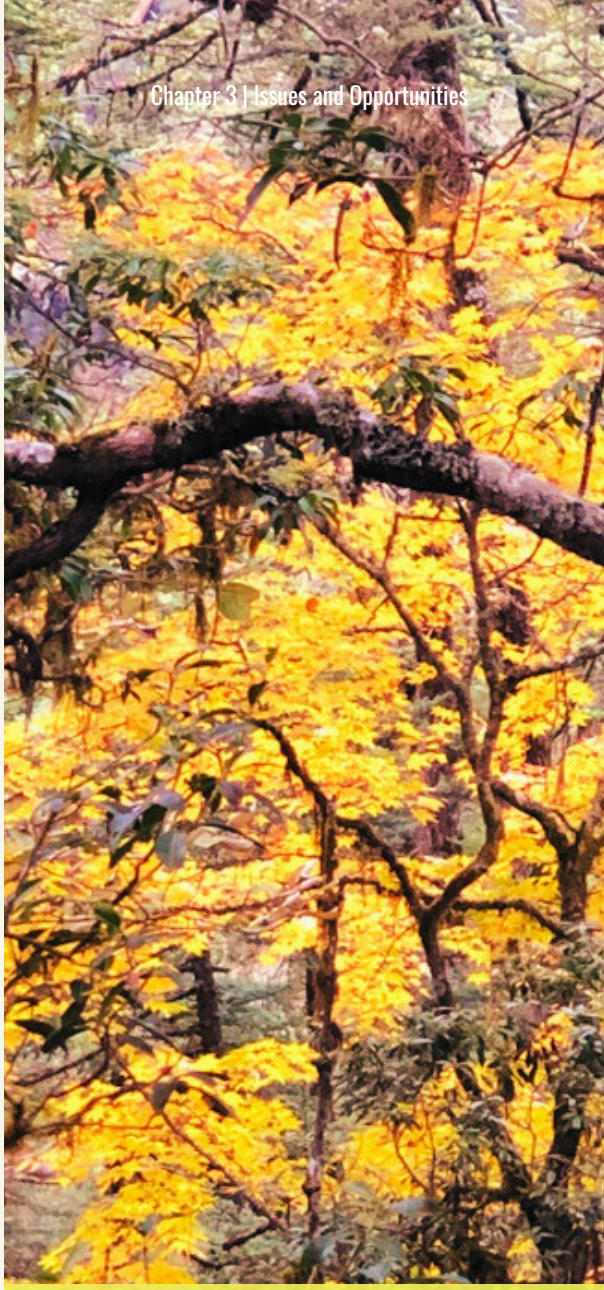
3.1 MANAGEMENT OF AREAS WITH HIGH BIODIVERSITY

Bhutan's global reputation for environmental leadership is reflected in its extensive network of protected areas, biological corridors, and the Royal Botanical Park, collectively covering 52% of the country's total land area. This conservation framework has played a vital role in protecting biodiversity, sustaining ecological connectivity, and maintaining ecosystem services.

However, recent assessments, including the 2024 National Tiger Survey (DoFPS, 2023), reveal that significant biodiversity exists outside these formally protected areas, particularly in wetlands, freshwater ecosystems, and agricultural landscapes, many of which are increasingly threatened by land-use change. For example, more tigers were recorded outside protected areas than within them, underscoring critical gaps in the current conservation approach.

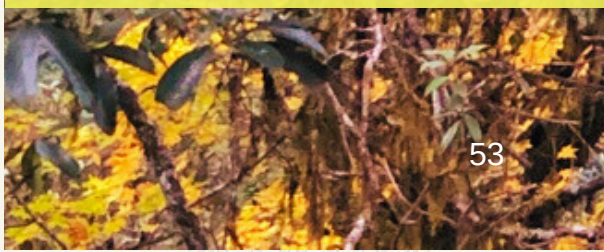
Addressing these gaps requires a shift toward integrated landscape conservation. A priority action will be the incorporation of spatial biodiversity data into national land-use planning processes, particularly through updates to Bhutan's National Land Use Zoning (NLUZ) system[7].

7. NLUZ system is Bhutan's strategic tool for allocating land use based on biophysical suitability, socio-economic needs, and conservation values (RGoB, 2023).



"2024 Tiger Survey revealed more tigers outside protected areas than within"

Photo: Forests (Courtesy: Karma C. Nyedrup)



3.2 SPECIES CONSERVATION

Bhutan's sustained commitment to biodiversity conservation has enabled the survival of several globally threatened and keystone species. The country emphasizes in-situ conservation, protecting species in their natural habitats, and supplements it with ex-situ measures, such as the conservation breeding program for the critically endangered White-bellied Heron[8].

However, conservation efforts have traditionally focused on a limited number of charismatic flagship species, while many lesser-known taxa, including microbes, freshwater invertebrates, soil organisms, and components of agrobiodiversity, remain underrepresented in research and protection efforts. Bhutan also lacks a comprehensive national Red List to assess extinction risk across taxa, and not all known threatened species are covered by conservation action plans. Additional constraints include limited technical capacity, insufficient infrastructure, and low investment in modern conservation tools such as genetic monitoring and species tracking technologies.

Photo: Sambar Deer (*Rusa unicolor*)
Courtesy: Tshering Tobgay

To strengthen conservation outcomes, Bhutan must expand its species assessments to cover neglected taxonomic groups, establish national Red Lists, and fully implement action plans for threatened species, including native crops and livestock breeds that support agrobiodiversity.

8. The White-bellied Heron (Ardea insignis) is one of the world's rarest birds, with fewer than 60 individuals estimated globally. Bhutan hosts a significant portion of the remaining population.

3.3 CONSERVATION OF GENETIC DIVERSITY

The National Biodiversity Centre leads the efforts to conserve plant and animal genetic resources by managing the national gene banks and biorepositories. The Centre also plays a central role in the in-situ and ex-situ conservation of native livestock breeds such as the *Nublang* cattle, sheep, and *Saphag* pig, alongside traditional crop varieties. In the wild, genetic diversity is supported through ecological connectivity within Bhutan's extensive protected area network, contributing to the conservation of wild and cultivated genetic resources.

However, Bhutan faces challenges in safeguarding the full spectrum of genetic diversity. Technical capacity and awareness remain limited, with initiatives targeting native breeds and neglected and underutilized species (NUS[9]) often remaining fragmented and underfunded. Ex-situ infrastructure, particularly for animal genetic material such as cryopreservation, is still nascent, with persistent gaps in research, documentation, and long-term monitoring.

To address this gap, there is a need to strengthen national capacity and enhance institutional coordination for long-term, sustainable conservation of Bhutan's genetic resources.

9. NUS are traditionally cultivated species but limited research, policy, or conservation focus.

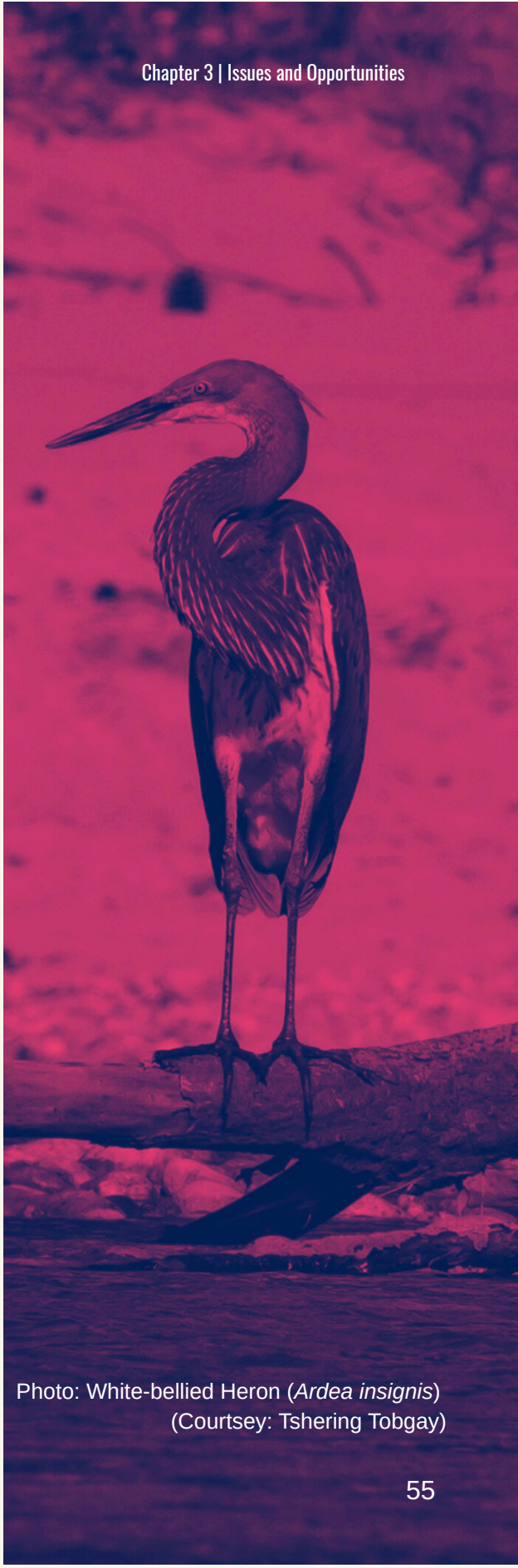


Photo: White-bellied Heron (*Ardea insignis*)
(Courtsey: Tshering Tobgay)

3.4 HUMAN-WILDLIFE CO-EXISTENCE

Human-Wildlife Co-existence (HWC) has emerged as one of Bhutan's most pressing conservation challenges, particularly in rural areas where dependence on agriculture and livestock is high. Despite the country's globally recognized conservation success, (NCD, 2008), coexistence between people and wildlife is becoming increasingly challenging. Bhutan's conservation policies permit human settlements within protected areas and biological corridors, further intensifying the interface between human activity and wildlife movement.

"DOFPS recorded 233 HWC cases in 2023"

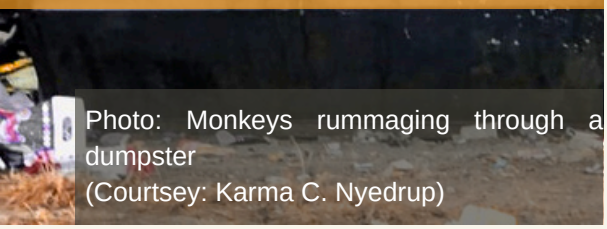


Photo: Monkeys rummaging through a dumpster
(Courtsey: Karma C. Nyedrup)

Notably, species such as elephants, tigers, wild boars, leopards, and Himalayan black bears are frequently involved in conflict incidents, causing substantial crop and livestock losses. In 2023, the DoFPS recorded 233 cases of HWC, with nearly half involving crop depredation. These rising incidents have led to heightened public frustration and growing resentment toward conservation programs among affected communities.

Bhutan's conservation success has also contributed to increased wildlife densities, which in turn have led to more frequent encounters between human and wildlife (Yeshey et al., 2023). At the same time, effective conflict response and mitigation remains limited due to institutional fragmentation with overlapping mandates and unclear accountability among key agencies (NCD, 2008).

Addressing HWC in Bhutan requires an integrated, inclusive, and forward-looking approach. Strengthening institutional coordination, investing in science-based mitigation strategies, and empowering communities through participatory planning and benefit-sharing mechanisms will be essential.

3.5 SUSTAINABLE USE OF BIODIVERSITY

Natural resources form the backbone of Bhutan's economy and rural livelihoods, supporting key sectors such as agriculture, livestock, fisheries, and forestry. These biodiversity-based systems also underpin the country's environmental stability and resilience.

However, unsustainable harvesting, illegal trade, poaching, and overexploitation are placing growing pressure on ecosystems, reducing their productivity, resilience, and the services they provide to communities.

Promoting sustainability across farming, livestock rearing, forest use, and fisheries will be essential to curb biodiversity loss and ecosystem degradation. This requires a transition toward more sustainable land and resource management practices that support rural livelihoods while easing pressure on ecological systems.

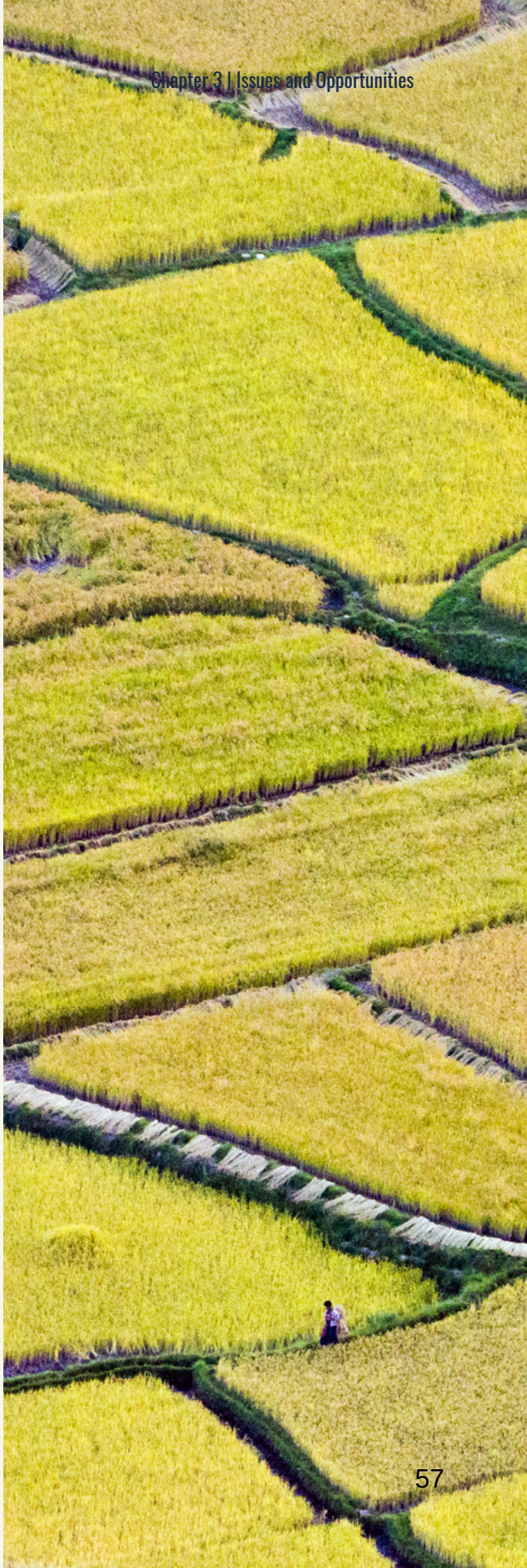


Photo: Paddy fields (Courtesy: Karma C. Nyedrup)

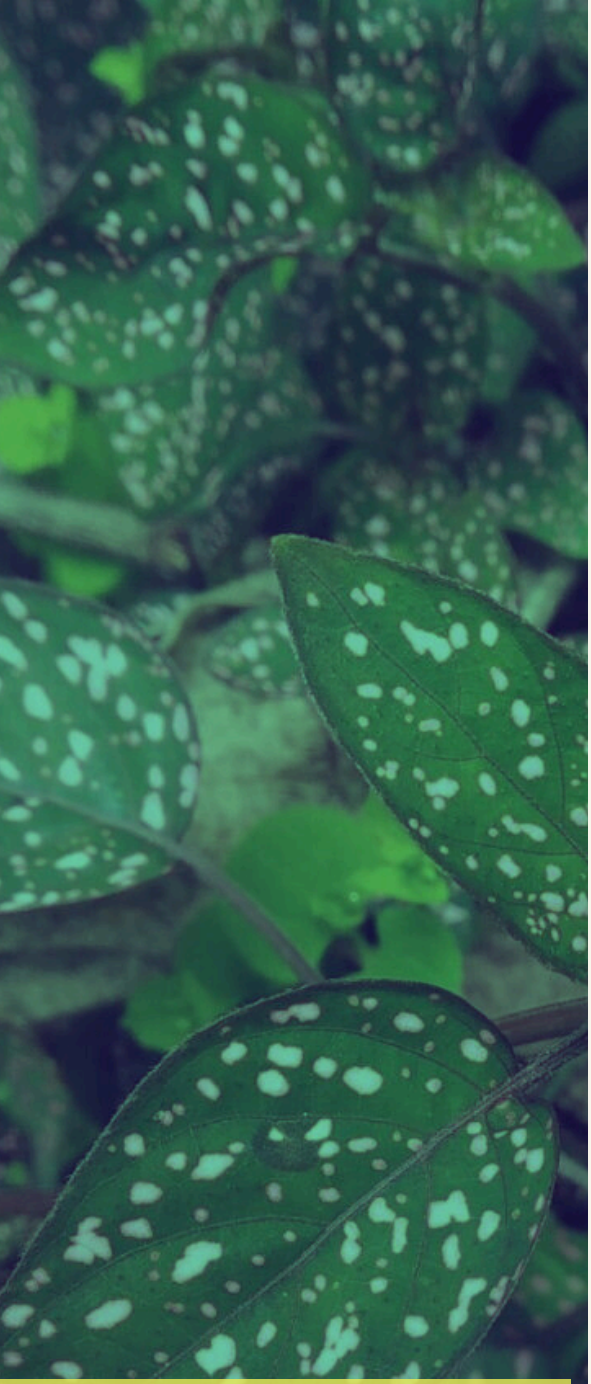
3.6 INVASIVE ALIEN SPECIES

Invasive Alien Species are widely recognized as a major driver of ecological degradation, economic loss, and human health risks. Globally, they contribute to an estimated 40% of all known animal extinctions by outcompeting and displacing native species.

In Bhutan, public awareness of IAS and their impacts on biodiversity remains low. While preliminary studies have produced a provisional list of invasive plant and animal species, the list is outdated and requires revision to reflect current ecological conditions. Research on other taxa, such as invasive fungi and aquatic species, is limited, and baseline data remains scarce.

Institutionally, IAS management in Bhutan is constrained by overlapping mandates and limited coordination among responsible agencies. The Bhutan Food and Drug Authority (BFDA) and Integrated Check Post (ICP) officials currently face capacity gaps in detecting and preventing the introduction of IAS at borders.

To address these challenges, Bhutan must strengthen public and institutional awareness, enhance inter-agency coordination, and invest in technical capacity for early detection, monitoring, and rapid response to IAS threats.



> **“IAS ARE RESONSIBLE FOR 40% OF ALL KNOWN ANIMAL EXTINCTON”**

Photo: Polka Dot Plant (*Hypoestes phyllostachya*)
(Courtsey: Nidup Dorji)

3.7 BIOSAFETY

Bhutan has reaffirmed its commitment to biosafety by acceding to the Cartagena Protocol in September 2003. This commitment was further solidified with enactment of the Biosafety Act of Bhutan 2015, which ensures the safe and responsible use of biotechnology within the country. This Act prohibits any activity involving GMOs in reproducible form.

Photo: BFDA Officials (Courtesey: BFDA)

Key challenges in biosafety include limited capacity for risk assessment and monitoring, inadequate levels of public awareness, insufficient GMO detection capacities, and the absence of a comprehensive liability and redressal mechanism.

Moreover, the rapid pace of biotechnological innovation, particularly in synthetic biology, gene drives[10], and other cutting-edge fields, presents unprecedented biosafety challenges that current regulatory frameworks may be ill-equipped to handle.

To address these issues, there is a need to strengthen public awareness, enhance institutional capacities at all levels, and update regulatory mechanisms to reflect current issues and any unintended negative effects of GMOs. Additionally, fostering international scientific cooperation will be critical to enable the effective transfer of technology, knowledge, and best practices, particularly in light of rapidly evolving biotechnology techniques including other novel technologies.

10. Gene drives are genetic tools designed to spread specific traits quickly through a population.

3.8 POLLUTION AND ITS IMPACT ON BIODIVERSITY

Despite Bhutan's strong constitutional and policy commitment to environmental protection, pollution has emerged as an escalating threat to biodiversity and ecosystem health. Rapid socio-economic development, urban expansion, and changing consumption patterns are contributing to rising levels of air, water, and solid waste pollution each exerting direct and indirect pressure on ecosystems.

Air pollution, primarily from increased vehicular emissions and industrial activities, can degrade air quality and affect plant productivity, soil chemistry, and overall ecosystem resilience. Water pollution, driven by untreated domestic sewage, industrial effluents, and agricultural runoff, poses significant risks to freshwater biodiversity and aquatic ecosystems. Solid waste particularly plastics and other non-biodegradable materials is accumulating in both urban and peri-urban areas, leading to habitat degradation, increased wildlife mortality, and the spread of invasive species.

Addressing these threats requires a multi-pronged approach. Strengthening environmental awareness and community participation will be essential for fostering behavioral change. Investing in pollution and biodiversity monitoring systems will support evidence-based decision-making and policy reform. Enhanced enforcement of environmental standards, combined with cross-sectoral coordination and institutional capacity-building, will be critical to reducing pollution and safeguarding Bhutan's biodiversity.

Pollution
(Courtesy: Kuensel)

Photo: High altitude lake
(Courtesy: UNDP Bhutan)

3.9 CLIMATE CHANGE AND BIODIVERSITY RESILIENCE

Bhutan's mountainous terrain, ecological sensitivity, and low socio-economic resilience make it highly vulnerable to climate risks. Rising temperatures and changing rainfall patterns are expected to intensify hazards such as GLOFs, droughts, forest fires, and pest outbreaks. These changes threaten ecosystem services, accelerate biodiversity loss, and disrupt rural livelihoods. Dependence on climate-sensitive sectors like hydropower and agriculture further heightens this vulnerability. Climate change is also accelerating invasive species spread and environmental degradation.

Rising threats of GLOFs

To build resilience, Bhutan must adopt integrated adaptation and mitigation strategies. Key priorities include diversifying energy sources, restoring ecosystems, and promoting climate-resilient agriculture. Green technologies and infrastructure will be critical in reducing climate shocks.

Strengthening early warning systems, especially for GLOFs, and investing in adaptive research and innovation will improve preparedness. Expanding access to climate finance, leveraging Bhutan's net-negative emissions, and promoting tools like ecological payments and green bonds will be essential to reinforce both economic and community resilience.

3.10 ACCESS AND BENEFIT SHARING

“14 ABS AGREEMENTS
14 ABS PRODUCTS
ABS FUND ESTABLISHED”

Photo: *Zhinor* Liniment Oil (Courtesy: NBC)

ACCESS BENEFIT SHARING

Photo: ABS logo

Since the introduction of its first Access and Benefit Sharing (ABS) program in 2009, Bhutan has made significant strides in operationalizing the principles of the Nagoya Protocol. Key milestones include the enactment of the Biodiversity Act of Bhutan 2022, the adoption of its Rules and Regulations in 2023, and the establishment of a dedicated ABS Fund, all of which contribute to a strong legal and institutional framework for ABS implementation.

These developments have enabled Bhutan to successfully execute 14 ABS agreements, leading to development of 14 ABS products in collaboration with international and national partners, as well as local communities. During the NBSAP 2014 stocktaking, the ABS target received the highest achievement score.

However, there are several challenges such as limited technical capacity and infrastructure, low public awareness on ABS and Digital Sequencing Information (DSI[11]), weak systems for product certification and market access.

Moving forward, there is a need to strengthen laboratory and technical capacities, foster inclusive community–private sector partnerships, and improve product development mechanisms through enhanced certification, branding, and access to national and international markets. Addressing these gaps will be essential for upscaling ABS-based enterprises, ensuring fair and equitable sharing of benefits and advancing biodiversity conservation and sustainable use of its component.

11. DSI refers to genetic data derived from biological resources, often used without accessing the physical material.

3.11 SCIENTIFIC RESEARCH AND KNOWLEDGE GAPS

Over the past decade, Bhutan has made steady progress in advancing conservation-related research. This includes species surveys and inventories, forest carbon stock assessments, climate risk assessments on forests and biodiversity, and the application of modern conservation technologies. These initiatives have contributed to national biodiversity management and policy.

However, research has largely focused on keystone and charismatic species, with limited attention to lower taxonomic groups such as invertebrates, fungi, and microbes. As a result, significant gaps remain in understanding broader biodiversity patterns, ecosystem dynamics, and ecological interactions. Research on genetic diversity, a critical component for species adaptation, resilience, and long-term survival, also remains underdeveloped. In addition, the impacts of emerging threats such as climate change, pollution, and invasive alien species are not yet adequately studied. Fields like bioprospecting and biodiscovery remain underdeveloped due to technical and infrastructural constraints.


(Courtesy: NBC)

To support science-based conservation, Bhutan must strengthen institutional research capacity, invest in infrastructure, and promote interdisciplinary studies. Priority should be given to research on climate impacts, ecosystem functioning, and genetic diversity, backed by centralized biodiversity data systems and long-term monitoring frameworks.

3.12 FUNDING FOR BIODIVERSITY CONSERVATION

Bhutan has always been at the forefront in biodiversity conservation and natural resource management. This is evident from the fact that between 1980 and 2019, approximately 249 biodiversity conservation projects have received funding, amounting to around USD 239.4 million (Devkota et al., 2022). During the 10th Five-Year Plan period, Bhutan conducted its first Public Environmental Expenditure Review (PEER) to ascertain the size and composition of public environmental expenditure to evaluate the government's environmental policies and priorities, along with environmental management reflected in the public expenditure (PEER, Department of Public Accounts, August 2014).

Despite these efforts, ensuring long-term, predictable, and sustainable financing for biodiversity conservation remains a key challenge. The COVID-19 pandemic and subsequent economic recovery have placed additional pressure on national budgets. Bhutan's graduation from Least Developed Country (LDC) status also poses future risks, as concessional financing and donor support may become increasingly limited. In parallel, shifting national priorities and a competitive global funding landscape further constrain the availability of resources for biodiversity.

To strengthen financial sustainability, it will be necessary to diversify financing sources. This includes exploring innovative mechanisms such as biodiversity bonds, carbon markets, green taxation, ecosystem service fees, and eco-tourism revenue models. Strengthening plough-back mechanisms like PES, where revenues are reinvested into conservation, can also help scale long-term impact.

> ***"Bhutan received USD 239.4 million for 249 biodiversity projects between 1980 and 2019"***

Photo: Phobjikha (Courtesy: Saran Pradhan)

3.13 INFORMATION, AWARENESS, AND KNOWLEDGE DISSEMINATION

A comprehensive and reliable biodiversity information system is essential for enabling evidence-based conservation planning, policy development, effective monitoring, and timely decision-making. At present, the generation and management of biodiversity data in Bhutan are fragmented across multiple institutions, each using different methodologies and maintaining separate databases. Weak coordination in biodiversity data management has led to inconsistencies in data quality and format, duplication of efforts, and limited accessibility. These challenges undermine national capacity to monitor biodiversity trends comprehensively and to support policy and reporting obligations at both national and international levels.

To address these constraints, there is a need to strengthen institutional coordination and harmonize legal, technical, and procedural frameworks governing biodiversity information. Establishing a nationally coordinated and interoperable biodiversity information system is essential to consolidate, validate, and standardize data across sectors, and to enable streamlined access for diverse users. Additionally, targeted assessments should be conducted to fill existing knowledge gaps, with a particular focus on underrepresented taxa and neglected ecosystems.

Photo: Rice Panicle (Courtesy: DoA)

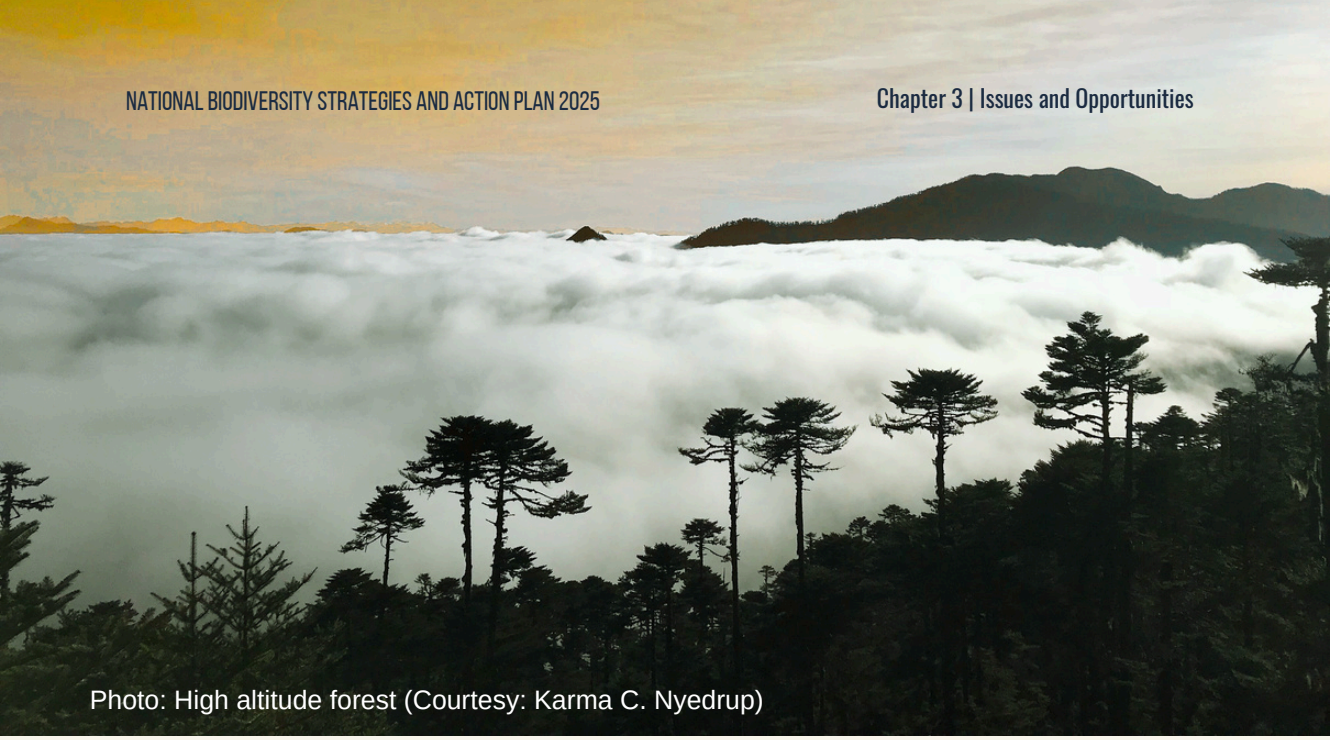


Photo: High altitude forest (Courtesy: Karma C. Nyedrup)

3.14 RECOGNIZING THE VALUE OF ECOSYSTEM SERVICES

Ecosystem services–clean air, fresh water, fertile soil, and climate regulation, are vital to Bhutan's sustainable development and well-being. They support food security, climate resilience, and rural livelihoods, and underpin key economic sectors like hydropower, agriculture, and tourism.

Ecosystem valued at $ 15.5 B

Despite their significance, ecosystem services remain undervalued in formal economic terms. While a 2013 study estimated their worth at USD 15.5 billion annually, no national update has followed. A 2019 valuation of forest ecosystem services estimated USD 394–1,269 million per year, underscoring forest value but omitting wetlands, rivers, and agricultural landscapes. As a result, nature's contributions are underrepresented in GDP and national planning, weakening conservation's role in economic decision-making. Efforts like PES, springshed management, and reforestation show promise but remain limited in scale.

Closing these gaps requires stronger evidence on ecosystem service values, integrated into policy, planning, and budgeting. This will demand updated national valuations, institutional capacity for environmental-economic accounting, and scalable nature-based solutions (NbS) that deliver both ecological and socio-economic benefits.

CONCLUSION AND SYNTHESIS

Bhutan's conservation achievements, anchored in its extensive protected area network, remain globally recognized. Yet, emerging assessments reveal that significant biodiversity also exists outside these zones, including wetlands, agricultural landscapes, and freshwater systems that remain unprotected and increasingly vulnerable. The National Tiger Survey, which recorded more tigers outside protected areas than within, underscores the need for a broader, landscape-level conservation strategy.

Species conservation efforts have largely focused on flagship and charismatic species, leaving many lesser-known taxa, including invertebrates, microbes, and freshwater fauna, under represented. This is compounded by the absence of a national Red List, limited research, and low investment in modern conservation technologies. Institutional and technical capacity constraints further hinder the scaling of both in-situ and ex-situ conservation initiatives.

At the same time, biodiversity and ecosystem services are under pressure from unsustainable harvesting, illegal exploitation, pollution, human–wildlife conflict, invasive alien species, and climate change. These threats are accelerating habitat degradation, affecting rural livelihoods, and eroding ecosystem resilience. Although Bhutan has made strides in biosafety, ABS, and ecosystem service valuation, challenges such as fragmented mandates, limited funding, and weak data systems persist.

These issues and opportunities form the foundation for the NBSAP targets, strategies, and actions. Opportunities for improvement under each thematic area have been formulated as targeted interventions and are presented in Chapter 4.

CHAPTER 4 NBSAP TARGETS, STRATEGIES, AND ACTIONS

Photo: Velvet Nuthatch (*Sitta frontalis*)
(Courtesy: Tshering Tobgay)

This chapter lays out the heart of Bhutan's NBSAP, with ambitious targets, broad strategies, and actions.

4.1 VISION

A happy and resilient Bhutan, living in harmony with nature by valuing mountain biodiversity.

4.2 MISSION

To ensure that mountain biodiversity is valued, conserved, and sustainably used through a holistic, concerted, and effective approach for fair and equitable sharing of benefits from biological resources aligning with Bhutan's environmental and socio-economic development.

Photo: Ruddy shelduck (*Tadorna ferruginea*)
(Courtesy: Bhutan Biodiversity Portal)

4.3 GUIDING PRINCIPLES

There is national commitment towards conservation and sustainable utilization of biodiversity as reflected in the rich conservation history, the Constitution and the development philosophy of GNH.

There is an intricate relationship between biodiversity and the economic, social and spiritual well being of the Bhutanese people.

There is a need to educate the public on the values of biodiversity and nurture participatory approaches in conservation to garner support and ensure that the people and the state equally share the responsibility and accountability for conservation.

It is vital to strengthen science, reinforce traditional knowledge systems, and build national capacities to integrate research and development for effective biodiversity conservation.

There is an urgent need to address threats and emerging challenges to biodiversity to prevent loss of biodiversity and ecosystem services.

It is crucial to secure sustainable financing mechanisms to uphold national commitments in biodiversity conservation.

There is substantial potential to derive economic benefits from biodiversity and ecosystem services to support livelihoods and contribute to the national economy.

There is a need to safeguard vulnerable groups, including women and children who are highly dependent on biodiversity and ecosystem services for their livelihoods.

There is a need to ensure the fair and equitable sharing of benefits arising from access to genetic resources to incentivize biodiversity conservation and promote sustainable utilization.

4.4 NBSAP 2025 Development Process

The current NBSAP was developed through a consultative and inclusive process, ensuring representation across government levels, sectors, and stakeholder groups. To coordinate the process, a dedicated NBSAP Secretariat was established at the NBC.

A Technical Working Group (TWG) was established, co-chaired by the NBC and the Department of Environment and Climate Change (DECC), with members from government ministries, autonomous agencies, academia, civil society, and development partners engaged in biodiversity conservation and sustainable development.

Between June 2023 and April 2025, a series of thematic workshops, technical working sessions, and national stakeholder consultations were convened to inform the Plan's structure and content. These platforms facilitated peer review, identification of policy and implementation gaps, and alignment of national biodiversity priorities with Bhutan's commitments under the Kunming-Montreal Global Biodiversity Framework (KMGBF).

> "20 targets
> 40 strategies
> 133 actions"

The final NBSAP outlines 20 national targets, supported by 40 strategies and 133 actions that reflect both national priorities and global obligations. These were validated through regional consultations involving all 20 *Dzongkhags*, ensuring the inclusion of local governments, sectoral agencies, community-based organizations, private sector actors, and monastic bodies. This inclusive approach reinforces national ownership and strengthens the foundation for effective implementation.

4.5 KUNMING-MONTREAL GLOBAL BIODIVERSITY FRAMEWORK (KMGBF)

Figure 3. Official Logo of the KMGBF (Left) (Source: CBD Website). Inspired by natural Voronoi patterns, the logo features 23 interconnected elements, each symbolizing a global target. It reflects unity, shared responsibility, and our deep connection to the planet's biodiversity.

4.6 Bhutan's NBSAP Targets aligned with KMGBF

This section outlines Bhutan's 20 National Targets, each linked to a corresponding KMGBF target shown by the adjacent icons and Annexure 1.

Target 1: By 2030, plan and manage all areas to reduce biodiversity loss

Target 2: By 2030, ensure at least 10% of degraded areas are brought under effective restoration

Target 3: By 2030, strengthen inclusive participation in biodiversity related decision-making processes

Target 4: By 2030, maintain the population of threatened species, conserve genetic diversity and manage human-wildlife conflict

Target 5: By 2030, ensure safe and legal harvesting of wild species for social, economic, and environmental benefits in a sustainable manner

Target 6: By 2030, manage invasive alien species to minimize their impacts on biodiversity

Target 7: By 2030, ensure reduction in pollution to minimize threats to biodiversity

Target 8: By 2030, minimize the adverse impacts of climate change on biodiversity and build resilience

Target 9: By 2030, ensure that information and knowledge related to biodiversity are available and accessible

Target 10: By 2030, ensure that areas under agriculture, livestock, fisheries, and forestry are managed for food security and livelihood

Target 11: By 2030, maintain and enhance nature's contribution to people

Target 12: By 2030, enhance and/or plan green and blue spaces in urban areas for social well-being and biodiversity conservation

Target 13: By 2030, increase the sharing of benefits from genetic resources, digital sequence information and traditional knowledge associated with biological resources

Target 14: By 2030, enhance mainstreaming and integration of NBSAP into national, sectoral, and local plans

Target 15: By 2030, ensure gender equality and gender-responsive approach in biodiversity actions.

Target 16: By 2030, promote sustainable consumption and production to reduce waste

Target 17: By 2030, strengthen implementation of biosafety measures

Target 18: By 2030, strategic interventions on incentives are streamlined to safeguard biodiversity

Target 19: By 2025, resources to support implementation of NBSAP are mobilized

Target 20: By 2030, strengthen capacity building, promote technology transfer, and facilitate technical and scientific cooperation

4.7 THE NBSAP TARGETS, STRATEGIES, ACTIONS, AND INDICATORS

The following section presents the NBSAP targets, along with their corresponding strategies, actions, and indicators. Each target is accompanied by a rationale that explains its significance and outlines the key measures required for its implementation. Icons at the top left (see figure 4) indicate alignment with specific targets under the KMGBF. Additional icons on the right denote the integration of each target with national priorities, particularly the 13th FYP, as well as mainstreaming into sectoral and local plans and alignment with the Sustainable Development Goals (SDGs).

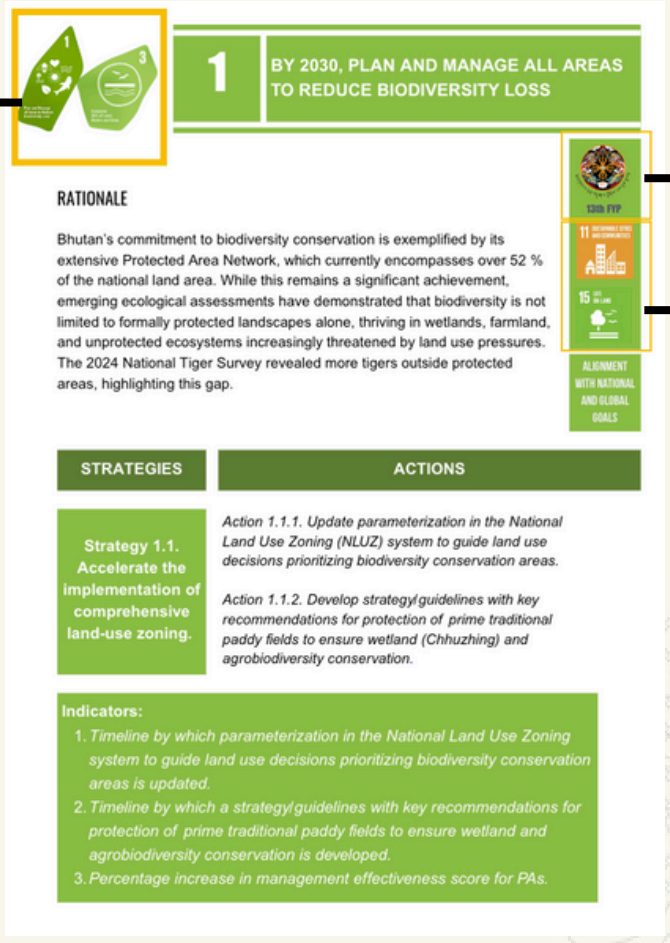
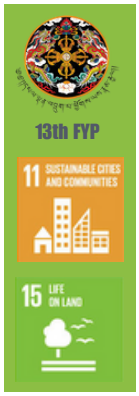


Figure 4. Illustrative outline of the NBSAP target page

1 BY 2030, PLAN AND MANAGE ALL AREAS TO REDUCE BIODIVERSITY LOSS

RATIONALE



ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

Bhutan's commitment to biodiversity conservation is exemplified by its extensive Protected Area Network, which covers over 52% of the country's total land area. While this is a significant achievement, recent ecological assessments indicate that important biodiversity also thrives outside protected landscapes, in wetlands, farmland, and freshwater ecosystems that remain vulnerable to land use change and degradation. For instance, the 2024 National Tiger Survey recorded a higher number of tigers outside protected areas than within, underscoring the need to broaden conservation efforts beyond current boundaries.

In line with Global Biodiversity Framework (GBF) Targets 1 and 3, this target aims to promote biodiversity-inclusive land use planning, strengthening the knowledge base and integrating spatial biodiversity data into national and local planning processes to reduce habitat fragmentation and enhance ecological connectivity.

STRATEGIES	ACTIONS
Strategy 1.1. Accelerate the implementation of comprehensive land-use zoning.	*Action 1.1.1. Update parameterization in the National Land Use Zoning (NLUZ) system to guide land use decisions, prioritizing biodiversity conservation areas.* *Action 1.1.2. Develop strategy/guidelines with key recommendations for the protection of prime traditional paddy fields to ensure wetland (Chhuzhing) and agrobiodiversity conservation.*

Strategy 1.2. Strengthen knowledge of biodiversity in areas of high ecological importance.	*Action 1.2.1. Assess and update the status of biodiversity in biological corridors and/or one freshwater ecosystems.* *Action 1.2.2. Update and incorporate spatial biodiversity data into the NLUZ.*
Strategy 1.3. Enhance management of areas of high ecological importance.	*Action 1.3.1. Update and/or develop management plans for protected areas (PAs) and Other Effective Area-based Conservation Measures (OECMs).* *Action 1.3.2. Implement management plans for PAs and OECMs.* *Action 1.3.3. Assess the management effectiveness of PAs and other managed forest areas using Bhutan management effectiveness tracking tool plus (METT+).* *Action 1.3.4. Institute river rangers and SMART patrolling program to protect freshwater biodiversity.* *Action 1.3.5. Develop management plans for key agrobiodiversity sites.* *Action 1.3.6. Conduct nationwide water resource inventory.* *Action 1.3.7. Develop at least one river basin management plan.*

Indicators:

1. Timeline for updating parameterization in the National Land Use Zoning System.
2. Timeline for developing a strategy or guidelines with key recommendations to protect prime traditional paddy fields for wetland and agrobiodiversity conservation.
3. Percentage increase in management effectiveness score for PAs.
4. Timeline for instituting a river rangers and SMART patrolling program to safeguard freshwater biodiversity.
5. Timeline for updating, developing, and implementing Management Plans for PAs, OECMs, and agrobiodiversity conservation sites.
6. Timeline for conducting a national water resource inventory.
7. Number of River Basin Management Plans developed.

2 BY 2030, ENSURE AT LEAST 10% OF DEGRADED AREAS ARE BROUGHT UNDER EFFECTIVE RESTORATION

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

RATIONALE

Bhutan's diverse ecosystems provide essential services to communities and underpin the country's long-term development. However, these ecosystems face increasing degradation due to habitat loss and fragmentation, primarily driven by infrastructure expansion and unsustainable land use practices. These pressures are eroding ecosystem integrity and reducing resilience.

In line with Target 2 of the GBF, this target prioritizes the restoration of degraded ecosystems through coordinated, science-based approaches.

STRATEGIES	ACTIONS
Strategy 2.1. Strengthen institutional coordination framework for restoration program.	*Action 2.1.1. Institute a multisectoral committee on restoration and rehabilitation to improve coordination.*

Strategy 2.2. Ensure degraded areas are brought under restoration for biodiversity conservation.

Action 2.2.1. Develop a guideline for restoration and rehabilitation of degraded areas, including rangeland.

Action 2.2.2. Conduct rangeland resource mapping.

Action 2.2.3. Identify and map degraded areas to establish baseline data.

Action 2.2.4. Implement restoration or rehabilitation activities in at least 10% of degraded areas.

Indicators:

1. Timeline for instituting a multi-sectoral committee on ecosystem restoration and rehabilitation.
2. Timeline for developing national guidelines on ecosystem restoration and rehabilitation.
3. Timeline for completing national rangeland resource mapping.
4. Timeline for establishing baseline data on the extent and condition of degraded ecosystems.
5. Increase in total acreage of degraded areas under effective restoration interventions.

3 BY 2030, STRENGTHEN INCLUSIVE PARTICIPATION IN BIODIVERSITY RELATED DECISION-MAKING PROCESSES

RATIONALE

Bhutan's commitment to inclusive and equitable environmental governance is grounded in its development philosophy and constitutional values. While efforts have been made to engage stakeholders at various levels, the participation of women, youth, local peoples, and other underrepresented groups in biodiversity-related decision-making remains limited.

Aligned with Target 22 of the GBF, this target seeks to institutionalize inclusive participation by establishing clear guidelines and standardized mechanisms to ensure and monitor equitable representation in biodiversity governance.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 3.1. Ensure inclusive stakeholder participation at all levels.	*Action 3.1.1. Develop a guideline for inclusive participation in biodiversity-related decision-making, considering diverse genders and groups.* *Action 3.1.2. Develop a standard mechanism to monitor inclusive participation in biodiversity related decision-making.*

Indicators:

1. Timeline for developing national guidelines to ensure inclusive participation in biodiversity related decision-making.
2. Timeline for establishing a standardized mechanism to monitor inclusive participation in biodiversity planning and governance.

4 BY 2030, MAINTAIN THE POPULATION OF THREATENED SPECIES, CONSERVE GENETIC DIVERSITY AND MANAGE HUMAN-WILDLIFE CONFLICT

RATIONALE

Bhutan's rich biodiversity, comprising over 11,000 documented species, faces escalating threats from habitat loss, climate change, illegal exploitation, and genetic erosion. Conservation efforts are further constrained by limited knowledge of lesser-known taxa and underdeveloped strategies for conserving genetic diversity, critical for species resilience and long-term ecosystem stability. Rising human–wildlife conflict also threatens both vulnerable species and rural livelihoods.

In line with the GBF Target 4, this target adopts a multifaceted approach, including updating knowledge and information on neglected taxa, developing species conservation and recovery plans, strengthening ex situ conservation facilities, using innovative monitoring tools, and the implementing evidence-based HWC mitigation measures.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 4.1. Strengthen conservation of threatened species.	*Action 4.1.1. Develop/ Update baseline data for invertebrates, fish, herpetofauna, bryophytes, fungi and soil microbes.* *Action 4.1.2. Update the National Red List of species.* *Action 4.1.3. Develop and implement species-specific conservation action plans for at least two threatened species.* *Action 4.1.4. Explore and use emerging technologies for monitoring threatened species.*

Strategy 4.2. Strengthen conservation of genetic diversity of threatened species.	*Action 4.2.1. Expand and/or establish biorepositories and genebanks.* *Action 4.2.2. Conduct an inventory of crop wild relatives for conservation.* *Action 4.2.3. Develop and implement conservation action plans for native livestock species.* *Action 4.2.4. Initiate germplasm conservation of key wildlife species.* *Action 4.2.5. Strengthen conservation breeding programs of the critically endangered White-bellied Heron.*
Strategy 4.3. Strengthen Human-Wildlife Conflict Management initiatives.	*Action 4.3.1. Update Human-Wildlife Conflict hotspot map.* *Action 4.3.2. Develop a holistic management plan to effectively manage human-wildlife conflict in strategic HWC hotspot areas.* *Action 4.3.3. Implement innovative interventions for protection against wildlife.* *Action 4.3.4. Institute crop and livestock insurance scheme at national level.* *Action 4.3.5. Strengthen one health program linking biodiversity conservation, and human and animal health.*

Indicators:

1. Number of studies conducted to generate baseline data on lesser-known and neglected biodiversity.
2. Number of species in Bhutan assessed and published in the IUCN Red List.
3. Number of Species Conservation Action Plans developed and implemented.
4. Timeline for establishing or expanding biorepositories and genebanks for biodiversity conservation.
5. Number of germplasm accessions conserved in national biorepositories for research, conservation, and development.
6. Timeline for completing an inventory of crop wild relatives for conservation planning.
7. Timeline for developing and implementing conservation action plans for native livestock species.
8. Timeline for initiating germplasm conservation efforts for key wildlife species.
9. Trends in the success rate of conservation breeding programs for the critically endangered White-bellied Heron.
10. Timeline for developing a national HWC hotspot map.
11. Number of innovative HWC mitigation measures implemented.
12. Timeline for establishing national crop and livestock insurance schemes.

5 BY 2030, ENSURE SAFE AND LEGAL HARVESTING OF WILD SPECIES FOR SOCIAL, ECONOMIC, AND ENVIRONMENTAL BENEFITS IN A SUSTAINABLE MANNER

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

13th FYP

14 LIFE BELOW WATER

15 LIFE ON LAND

RATIONALE

Wild species are integral to Bhutan's traditional medicine, rural livelihoods, and cultural heritage. However, unsustainable harvesting, changing market dynamics, and habitat degradation are increasingly threatening their long-term viability. Efforts to ensure sustainable use are hampered by limited data on species distribution, population trends, and harvest intensity, as well as insufficient institutional capacity for monitoring and enforcement. These gaps constrain evidence-based policymaking and effective regulation.

In line with Target 5 of the GBF, this target seeks to promote the sustainable and legal use of wild species by strengthening resource assessments, refining regulatory frameworks, and enhancing enforcement and compliance capacities.

STRATEGIES	ACTIONS
Strategy 5.1. Strengthen sustainable utilization of economically important wild species.	*Action 5.1.1. Conduct resource assessment of economically important wild species, including those used in Bhutanese Traditional Medicine (Sowa Rigpa).* *Action 5.1.2. Carry out domestication trial for at least one identified species.* *Action 5.1.3. Review and recommend amendment of the Forest and Nature Conservation Rules and Regulations (FNCRR) 2023 to incorporate emerging trade of wild species.*

Action 5.1.4. Update guidelines for sustainable utilization of economically important wild species, integrating biodiversity and health.

Action 5.1.5. Update or develop community-based management plans for sustainable management and harvesting of wild species.

Action 5.1.6. Enforce effective compliance monitoring of illegal collection of wild species.

Indicators:

1. Timeline for conducting resource assessment of economically important wild species.
2. Number of guidelines or management plans developed or updated for the sustainable management of wild species.
3. Timeline for submitting recommendations to review the FNCRR 2023 to incorporate provisions for emerging trade in wild species.
4. Number of innovative technologies adopted for monitoring wild species.

6 BY 2030, MANAGE INVASIVE ALIEN SPECIES TO MINIMIZE THEIR IMPACTS ON BIODIVERSITY

RATIONALE

Invasive Alien Species (IAS) are a growing concern in Bhutan, threatening native biodiversity, ecosystem integrity, and agricultural productivity. Despite recognition of the risks, current responses are constrained by fragmented institutional mandates, weak inter-agency coordination, and the lack of effective early detection and rapid response mechanisms.

In alignment with GBF Target 6, this target aims to strengthen Bhutan's IAS management system by clarifying institutional roles, developing operational guidelines and Standard Operating Procedures (SOPs), and building a robust knowledge base through research and an updated national IAS database.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 6.1. Strengthen coordination mechanisms for the management of IAS.	*Action 6.1.1. Review existing legislation to streamline roles and responsibilities for coordinated management of IAS.* *Action 6.1.2. Develop guidelines/SOP for effective management of the IAS pathways.* *Action 6.1.3. Implement guidelines/SOP for management of IAS.*

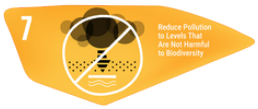
Strategy 6.2. Strengthen knowledge of IAS and its impacts.

Action 6.2.1. Conduct research on the status of IAS pathways, distribution, and impact.

Action 6.2.2. Update and maintain the IAS database.

Indicators:

1. Timeline for completing revisions of existing legislation to clarify and streamline roles and responsibilities related to IAS management.
2. Number of guidelines or SOPs developed for the management of key IAS.
3. Number of research and studies conducted on the status, distribution, and impacts of IAS in Bhutan.
4. Timeline for updating and maintaining a centralized IAS database.



7 BY 2030, ENSURE REDUCTION IN POLLUTION TO MINIMIZE THREATS TO BIODIVERSITY

RATIONALE

Pollution is an emerging threat to Bhutan's biodiversity, with chemicals, heavy metals, untreated waste, and agrochemical use contributing to habitat degradation, reduced ecosystem resilience, and declining environmental quality. Although Bhutan has a legal framework for pollution control and waste management, enforcement is currently weak. Additionally, the ecological impacts of pollution, particularly on biodiversity, are poorly understood due to the limited assessment and monitoring.

In line with the GBF Target 7, this target seeks to reduce pollution-related pressures on ecosystems by strengthening mitigation measures and enhancing monitoring.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 7.1. Enhance measures to mitigate pollution that have adverse impacts on biodiversity.	*Action 7.1.1. Identify major pollutants that have adverse impacts on biodiversity.* *Action 7.1.2. Identify and adopt state-of-the-art technologies to abate pollution.* *Action 7.1.3. Update the existing Environmental Standards 2020 and the Initial Environmental Examination (IEE) guidelines.*

Strategy 7.2. Strengthen compliance monitoring of developmental activities that have adverse impacts on biodiversity.

Action 7.2.1. Conduct annual compliance monitoring of developmental activities, among others, taking into consideration adverse impacts on biodiversity.

Action 7.2.2. Conduct gap assessment of the existing waste management facilities to ensure effective monitoring of environmental standards.

Indicators:

1. Timeline for initiating research on pollution control innovations, technologies, and management practices.
2. Timeline for establishing clean technology incentive schemes to support pollution control measures.
3. Timeline for updating national IEE guidelines.
4. Timeline for conducting a gap assessment of existing waste management facilities to ensure effective monitoring of environmental standards.

8 BY 2030, MINIMIZE THE ADVERSE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

RATIONALE

Climate change is an escalating threat to biodiversity, with shifting temperature and precipitation patterns altering species distributions, disrupting ecosystem processes, and increasing the frequency of climate-related hazards. These impacts are especially pronounced in Bhutan's fragile mountain ecosystems, where species are highly specialized and sensitive to even minor climatic shifts. However, scientific understanding of these impacts remains limited, with most evidence drawn from a few isolated studies.

In alignment with the GBF Target 8, this target aims to minimize the impacts of climate change on biodiversity by strengthening knowledge of climate–biodiversity linkages, enhancing carbon sequestration, and reducing emissions to uphold Bhutan's carbon neutrality.

STRATEGIES	ACTIONS
Strategy 8.1. Enhance knowledge and understanding of the adverse impacts of climate change on biodiversity.	*Action 8.1.1. Conduct research on the adverse impacts of climate change on mountain biodiversity and develop policy briefs for informed decision-making.* *Action 8.1.2. Implement recommendations based on the outcomes of the research.* *Action 8.1.3: Organize at least one symposium/seminar/conference on mountain biodiversity, focusing on biodiversity and health, at the international level.*

Strategy 8.2. Increase carbon sequestration and reduce emissions to uphold carbon neutrality.

Action 8.2.1. Explore and adopt renewable energy sources to reduce carbon emissions.

Action 8.2.2. Upscale afforestation and reforestation programs.

Action 8.2.3. Strengthen forest fire prevention and management measures.

Action 8.2.4. Develop guidelines for the scientific management of landfills to regulate Green House Gas (GHG) emissions.

Action 8.2.5. Foster regional and international collaborations for climate financing, carbon trading and REDD+ initiatives.

Indicators:

1. Number of research studies conducted on the impacts of climate change on mountain biodiversity.
2. Trends in forest fire incidence.
3. Number of renewable energy sources adopted for climate change mitigation and adaptation.
4. Number of SOPs developed for landfill management to regulate greenhouse gas GHG emissions.
5. Trends in the amount of climate finance accessed for biodiversity and ecosystem-based climate solutions.

9 BY 2030, ENSURE THAT INFORMATION AND KNOWLEDGE RELATED TO BIODIVERSITY ARE AVAILABLE AND ACCESSIBLE

RATIONALE

A robust biodiversity information base is essential for evidence-based conservation planning, monitoring, and decision-making. While Bhutan has made notable progress in generating data on key species and habitats, data gaps continue to affect understanding of lesser-known taxa, ecosystem functions, and long-term population trends. Data also remains fragmented across institutions, inconsistently managed, and often inaccessible, limiting Bhutan's ability to monitor biodiversity change and inform timely policy responses.

Aligned with GBF Target 21, this target aims to improve the availability and accessibility of biodiversity data by prioritizing assessments of underrepresented taxonomic groups and establishing a centrally coordinated, interoperable information system for streamlined, cross-platform access.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 9.1. Strengthen biodiversity-related information and knowledge base.	*Action 9.1.1. Identify data gaps in biodiversity-related information and knowledge.* *Action 9.1.2. Conduct targeted biodiversity assessments to address data gaps.* *Action 9.1.3. Develop SOPs for data collation, validation, and publication.* *Action 9.1.4. Update the Bhutan Biodiversity Statistics.*

Strategy 9.2. Enhance availability and accessibility of biodiversity-related information and knowledge.

Action 9.2.1. Establish a national Global Biodiversity Information Facility (GBIF) node to facilitate biodiversity data sharing and integration.

Action 9.2.2. Upgrade the Bhutan Biodiversity Portal as a centralized biodiversity data repository.

Action 9.2.3. Make Bhutan Biodiversity Portal website/app user-friendly and accessible across multiple platforms.

Indicators:

1. Number of targeted biodiversity assessments conducted to address critical knowledge gaps.
2. Number of SOPs developed for biodiversity data collation, validation, and publication.
3. Timeline for updating the Bhutan Biodiversity Statistics report.
4. Number of registered contributors on the Bhutan Biodiversity Portal.
5. Timeline for establishing a national GBIF node to facilitate biodiversity data sharing and integration.
6. Timeline for upgrading the Bhutan Biodiversity Portal to enhance usability, accessibility, and data interoperability.

10 BY 2030, ENSURE THAT AREAS UNDER AGRICULTURE, LIVESTOCK, FISHERIES, AND FORESTRY ARE MANAGED SUSTAINABLY FOR FOOD SECURITY AND LIVELIHOOD

RATIONALE

Bhutan's agriculture is largely traditional and subsistence-based, shaped by mountainous terrain and small, fragmented landholdings. Agriculture, livestock, forestry, and fisheries are vital to food security and livelihoods, and are closely tied to ecosystem services such as soil fertility, water regulation, and pollination. However, climate change, land degradation, pest outbreaks, and unsustainable practices are placing growing pressure on biodiversity and ecosystem functions, threatening long-term sustainability.

Aligned with GBF Target 10, this target promotes biodiversity-friendly, sustainable production systems by improving ecosystem management, mainstreaming nature-based solutions, and strengthening the resilience of food and resource systems.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 10.1. Strengthen sustainable agriculture and livestock practices.	*Action 10.1.1. Assess and promote new and improved crop and forage varieties, livestock and fish breeds.* *Action 10.1.2. Assess and promote improved livestock breeding and management practices including herd-health and farm biosecurity.* *Action 10.1.3. Upscale Sustainable Land Management (SLM) practices.* *Action 10.1.4. Develop Good Agricultural Practices (GAP) guidelines for prioritized agricultural commodities.*

	Action 10.1.5. Upscale fruit production to enhance livelihood. *Action 10.1.6. Conduct applied research to promote sustainable agriculture and livestock practices.*
Strategy 10.2. Promote agricultural innovation and technology.	*Action 10.2.1. Pilot hi-tech agriculture farms and precision livestock farming.* *Action 10.2.2. Develop improved pasture and agro-silvopasture systems to enhance fodder availability.* *Action 10.2.3. Identify and adopt innovative technologies and approaches to improve soil fertility.* *Action 10.2.4. Improve surveillance systems for monitoring pests and transboundary animal diseases.* *Action 10.2.5. Upscale water use efficiency technologies and climate-proof irrigation systems to build climate resilience.* *Action 10.2.6. Adopt climate-smart agriculture and livestock farming practices and innovations.*
Strategy 10.3. Promote measures to mitigate crop and livestock damage against extreme climate conditions.	*Action 10.3.1. Strengthen agro-meteorological services through the Agromet Decision Support System (ADSS).* *Action 10.3.2. Pilot index-based crop and livestock insurance scheme to enhance adaptation to climate change impacts.*
Strategy 10.4. Strengthen sustainable management of forest resources.	*Action 10.4.1. Bring additional unmanaged State Reserved Forest land under sustainable forest management regimes.* *Action 10.4.2. Develop and implement management plans for Community Forests (CFs), Local Forest (LFs), and Forest Management Units (FMUs).*

Strategy 10.5. Strengthen sustainable management of fishery resources.

Action 10.5.1. Upscale recreational fishery programs.

Action 10.5.2. Revive existing and develop new community-based fisheries management programs.

Indicators:

1. Trends in adoption of new and improved crops and forage varieties, livestock, and fish breeds.
2. Areas brought under SLM.
3. Number of climate-smart agriculture and livestock research conducted and technologies adopted/released.
4. Timeline for developing GAP guidelines for prioritized agricultural commodities.
5. Timeline for conducting research on sustainable agriculture and livestock production systems.
6. Number of hi-tech agriculture farms piloted.
7. Timeline for developing improved pasture and agro-silvopasture systems to enhance year-round fodder availability.
8. Timeline for identifying and adopting innovative technologies and approaches to improve soil fertility.
9. Timeline for strengthening pest and disease surveillance and response systems.
10. Number of irrigation schemes established and operationalized.
11. Timeline for strengthening agro-meteorological services through the ADSS.
12. Timeline for piloting index-based crop and livestock insurance scheme.
13. Timeline for bringing additional State Reserved Forest (SRF) land under sustainable forest management.
14. Number of Sustainable Forest Management (SFM) plans developed and implemented.
15. Number of community-based forest enterprises established and functioning.
16. Number of community-based fishery management programs established or revived.

11 BY 2030, MAINTAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE

RATIONALE

Ecosystem services, such as clean air, fresh water, fertile soil, and climate regulation, are foundational to Bhutan's sustainable development and human well-being. They support food security, disaster risk reduction, and climate resilience, yet face growing threats from biodiversity loss, land degradation, and climate change. Despite their critical importance, the economic value of these services remains under-recognized, and contributions from natural assets like forests and watersheds are not fully reflected in GDP or national accounts.

Aligned with GBF Target 14, this target aims to enhance nature's contributions to people by promoting nature-based and ecosystem-based approaches, while prioritizing the implementation of the National Plan for Environmental-Economic Accounting in Bhutan (2024–2029) to better integrate ecosystem values into development planning and policy.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 11.1. Promote nature-based solutions and ecosystem-based approaches.	*Action 11.1.1. Explore and adopt nature-based solutions in climate adaptation and mitigation, disaster risk reduction, including forest fires, water and food security, habitat restoration, and socio-economic benefits and livelihoods.*

Action 11.1.2. Implement at least two nature-based solutions related to biodiversity conservation and sustainable livelihood.

Action 11.1.3. Explore and initiate isolation and identification of beneficial soil microbes and insects for biofertilizer production and bioprospecting.

Strategy 11.2. Mainstream economic value of ecosystem services into the national accounting system.

Action 11.2.1. Implement the National Implementation Plan for the System of Environmental-Economic Accounting (SEEA) in Bhutan (2024-2029).

Indicators:

1. Timeline for implementing NbS and ecosystem-based approaches for climate resilience and biodiversity conservation.
2. Timeline for identifying beneficial soil microbes and insects for bioprospecting and sustainable utilization.
3. Timeline for implementing the SEEA.
4. Number of NbS related to biodiversity conservation and sustainable livelihood implemented.

12 BY 2030, ENHANCE AND/OR PLAN GREEN AND BLUE SPACES IN URBAN AREAS FOR SOCIAL WELL-BEING AND BIODIVERSITY CONSERVATION

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

RATIONALE

Integrating biodiversity into urban planning, particularly through green and blue spaces, is vital for building resilient, healthy, and sustainable thromdes and municipalities. As urbanisation accelerates, these natural features offer multiple co-benefits: strengthening human–nature connections, enhancing urban biodiversity, regulating stormwater, moderating temperature, and improving public health and recreation.

Bhutan's visionary Gelephu Mindfulness City (GMC) exemplifies this approach, with a master plan that integrates ecological corridors, green infrastructure, and water-sensitive urban design to promote biodiversity and sustainability. While biodiversity may not yet be central to planning in existing towns, projected urban growth highlights the need for forward-looking, biodiversity-inclusive development.

Aligned with the GBF Target 12, this target aims to enhance green and blue infrastructure in urban areas by establishing biodiversity-integrated planning frameworks and advancing research to assess ecological and biodiversity outcomes.

STRATEGIES	ACTIONS
Strategy 12.1. Strengthen biodiversity-inclusive urban planning and development.	*Action 12.1.1. Develop frameworks/guidelines for inclusive planning, management, and monitoring of green and blue spaces.* *Action 12.1.2. Conduct inventory of existing green and blue spaces, focusing on urban areas.*

Action 12.1.3. Establish and/or maintain green and blue spaces in Thromdes, taking into consideration people with special needs.

Action 12.1.4. Develop City Biodiversity Index (CBI) in at least two Thromdes.

Action 12.1.5. Conduct research to evaluate the health and biodiversity value of green and blue spaces.

Action 12.1.6. Revise the Building Codes of Bhutan to incorporate the concept of green and blue spaces in urban planning.

Indicators:

1. Number of guidelines reviewed or developed to promote the integration of green and blue spaces in urban planning.
2. Timeline for completing a national inventory of existing green and blue spaces in urban areas.
3. Number of new green and blue spaces developed with integrated biodiversity conservation features.
4. Number of cities/*Thromdes* where the CBI has been initiated or developed.

13 BY 2030, INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE ASSOCIATED WITH BIOLOGICAL RESOURCES

RATIONALE

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

Bhutan's rich biodiversity and traditional knowledge systems are vital national assets, supporting livelihoods, healthcare, and cultural identity. As a Party to the Nagoya Protocol, Bhutan is committed to fair and equitable sharing of benefits arising from the use of genetic resources and associated traditional knowledge. Significant progress has been made, reflected by the ABS target receiving the highest achievement score in the fourth NBSAP, largely due to the establishment of a robust legislative framework. Nonetheless, ABS remains a relatively new domain. Key challenges persist, including low public awareness, limited technical capacity, weak institutional coordination, and nascent efforts in product development, certification, and branding.

Aligned with GBF Target 13, this target seeks to strengthen institutional coordination, raise awareness, scale up bioprospecting, and promote sustainable, community-based ABS enterprises that contribute to conservation and fair and equitable sharing of benefits.

STRATEGIES	ACTIONS
Strategy 13.1. Strengthen the coordination mechanism for the implementation of the Access and Benefit Sharing regime to ensure fair and equitable sharing of benefits and prevention of misappropriation.	*Action 13.1.1. Develop Communication, Education and Public Awareness (CEPA) Strategies on Access and Benefit Sharing.* *Action 13.1.2. Enforce the Biodiversity Act of Bhutan 2022 and Biodiversity Rules and Regulations 2023 to ensure fair and equitable sharing of benefits and prevent misappropriation.* *Action 13.1.3. Participate in regional and international fora on Access and Benefit Sharing to foster institutional linkages.*

Action 13.1.4. Upscale Bioprospecting and Access and Benefit Sharing initiatives, and explore branding and certification of bioprospecting-based products.

Action 13.1.5. Establish a Bhutan Access and Benefit Sharing Clearing House Mechanism.

Action 13.1.6. Develop a strategy to make the Bhutan Access and Benefit Sharing fund innovative and sustainable.

Strategy 13.2. Strengthen the repository of Traditional Knowledge associated with biological resources and customary practices relevant to biodiversity conservation and sustainable use.

Action 13.2.1. Document traditional knowledge (TK) associated with biological resources and customary practices relevant to biodiversity conservation and sustainable use.

Action 13.2.2. Develop a strategy for the protection and appropriate utilisation of traditional knowledge associated with biological resources.

Indicators:

1. Timeline for developing a CEPA strategy on ABS.
2. Number of institutional facilities and capacities established for biodiscovery and bioprospecting.
3. Number of initiatives, agreements, and nature-based products implemented under the ABS framework.
4. Timeline for developing a national strategy on TK associated with biological resources.
5. Timeline for establishing the national ABS Clearing-House Mechanism.
6. Timeline for developing a national strategy for the operationalization of the Bhutan ABS Fund.

14 BY 2030, ENHANCE MAINSTREAMING AND INTEGRATION OF NBSAP INTO NATIONAL, SECTORAL, AND LOCAL PLANS

RATIONALE

The NBSAP serves as Bhutan's national guiding framework for biodiversity conservation. Since 1997, four BAPs have been implemented. However, the integration of biodiversity priorities into national, sectoral, and local plans has remained limited. This has resulted in fragmented implementation, overlapping efforts, and reduced overall efficiency, thereby constraining progress toward national biodiversity targets.

In line with the GBF Target 14, this target seeks to strengthen the mainstreaming of biodiversity across policies and programs by securing high-level government endorsement of the NBSAP and promoting stronger coherence with the three Rio Conventions and other international commitments.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

13th FYP

STRATEGIES	ACTIONS
Strategy 14.1. Mainstream NBSAP into policies, strategies, plans and programs.	*Action 14.1.1. Endorse NBSAP as the national guiding document.* *Action 14.1.2. Establish a multi-sectoral committee or entrust the responsibility to one of the relevant existing committees to oversee the implementation of the NBSAP.* *Action 14.1.3. Conduct sector-specific workshops to identify entry points for NBSAP targets, and incorporate relevant actions into the sector plans.* *Action 14.1.4. Align Nationally Determined Contributions (NDC) 3.0 with the fifth NBSAP to integrate biodiversity considerations into climate commitments.*

Indicators:

1. Timeline for the revision and official endorsement of the NBSAP.
2. Timeline for establishing a multi-sectoral committee to oversee NBSAP implementation and coordination.
3. Proportion of NBSAP strategies and actions mainstreamed into national, sectoral, and local development plans.

15 BY 2030, ENSURE GENDER EQUALITY AND GENDER-RESPONSIVE APPROACH IN BIODIVERSITY ACTIONS

RATIONALE

Bhutan's biodiversity-rich landscapes are closely linked to community livelihoods, where gender roles shape natural resource use. Women make up 73.6% of the rural workforce and 52.5% of the agricultural workforce, contributing significantly through traditional knowledge and sustainable practices. Yet, they remain underrepresented in biodiversity decision-making. Biodiversity loss disproportionately impacts women and vulnerable groups, especially in rural areas. Most environmental policies still lack explicit gender integration, a gap identified in the fourth NBSAP review.

Aligned with the GBF Target 23, the current NBSAP introduces a dedicated target to institutionalize gender-responsive approaches and ensure more inclusive and equitable conservation outcomes.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 15.1. Promote gender-responsive approaches in biodiversity conservation programs.	*Action 15.1.1. Conduct gender analysis in biodiversity conservation programs to assess and address gender-specific gaps and opportunities.* *Action 15.1.2. Develop gender and biodiversity action plans.* *Action 15.1.3. Implement gender and biodiversity action plans.* *Action 15.1.4. Assess the implementation of gender and biodiversity actions.*

Indicators:

1. Timeline for completing and validating a comprehensive gender analysis covering all biodiversity-related activities.
2. Timeline for developing a gender action plan and associated implementation tools for biodiversity programs.
3. Trends in the number and proportion of biodiversity programs with gender-responsive measures integrated.

16 BY 2030, PROMOTE SUSTAINABLE CONSUMPTION AND PRODUCTION TO REDUCE WASTE

RATIONALE

Sustainable Consumption and Production (SCP) is vital for reducing environmental pressures, enhancing resource efficiency, and advancing Bhutan's sustainability goals. SCP emphasizes minimizing waste through responsible production, eco-design, and sustainable procurement, while empowering consumers to make informed choices. However, experience with SCP in Bhutan remains limited, and institutional support is still evolving.

Aligned with GBF Target 16, this target promotes SCP practices by strengthening research, awareness, and information systems to support Bhutan's shift toward sustainable production and consumption, while reducing waste and conserving natural resources.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 16.1. Promote Sustainable Consumption and Production to minimize waste.	*Action 16.1.1. Institute compliance monitoring mechanism to minimize waste at source.* *Action 16.1.2. Explore and implement Extended Producer Responsibility (EPR) to reduce waste.* *Action 16.1.3. Explore and implement Public-Private Partnerships (PPP) in waste reduction and management.*

Stratgy 16.2. Promote Research and Development on Sustainable Consumption and Production technologies and innovations.

Action 16.2.1. Conduct research and development on post-production waste reduction technologies.

Action 16.2.2. Carry out research on the adverse impacts of waste on biodiversity.

Indicators:

1. Number of research studies undertaken on SCP practices.
2. Timeline for adopting post-production waste reduction technologies in priority sectors.
3. Timeline for implementing the EPR framework.
4. Number of PPP models implemented to promote SCP and waste management.
5. Trends in the percentage of waste generated at the source (household, industrial, commercial).
6. Trends in the quantity of waste generated due to improved raw material efficiency and usage.

17 BY 2030, STRENGTHEN IMPLEMENTATION OF BIOSAFETY MEASURES

RATIONALE

Bhutan's commitment to biosafety is reflected in its ratification of the Cartagena Protocol and the enactment of the Biosafety Act of Bhutan 2015, reinforcing its intent to safeguard biodiversity, human and animal health from unintended effect of GMOs. While key legal and administrative structures are in place, greater public awareness and engagement are still needed.

Aligned with the GBF Target 17, this target focuses on strengthening biosafety implementation by pursuing ratification of the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress, enhancing accountability, and revising the Biosafety Act to address evolving global practices and national priorities.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 17.1. Enhance national biosafety frameworks and operational capacities.	*Action 17.1.1. Initiate ratification of the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress by the Parliament.* *Action 17.1.2. Initiate revision of the Biosafety Act of Bhutan 2015.*

Indicators:

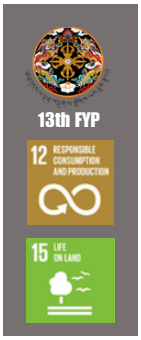
1. Timeline for initiating accession to the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol.
2. Timeline for initiating the revision of the Biosafety Act of Bhutan 2015.

18 BY 2030, STRATEGIC INTERVENTIONS ON INCENTIVES ARE STREAMLINED TO SAFEGUARD BIODIVERSITY

RATIONALE

Bhutan's development over the past six decades has been supported by substantial public subsidies across agriculture, forestry, and rural sectors. These incentives, ranging from seeds and fertilizers to livestock, timber, and firewood, have contributed significantly to food security, rural livelihoods, and economic development. Globally, however, poorly designed subsidies are increasingly recognized as drivers of biodiversity loss. While Bhutan's incentives have largely supported sustainability, their specific impacts on biodiversity remain under-assessed. A comprehensive review is needed to ensure future support measures are evidence-based, socially equitable, and biodiversity-friendly.

Aligned with the GBF Target 18, this target focuses on assessing and repurposing subsidies and incentives to better align with biodiversity goals while continuing to support inclusive development.



ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 18.1. Assess the impacts of incentives on biodiversity.	*Action 18.1.1. Conduct Comprehensive Impact Assessment of Incentives (encompassing review of policies, strategies and legislations).* *Action 18.1.2. Identify and prioritize incentives having adverse impacts on biodiversity.*

Action 18.1.3. Assess the severity of adverse impacts of at least one prioritized subsidy on biodiversity, and recommend the repurposing of prioritized incentives that negatively affect biodiversity.

Action 18.1.4. Develop a Monitoring and Evaluation Framework to track the impacts of subsidies over time on biodiversity.

Indicators:

1. Timeline for completing the identification, mapping, and assessment of incentives relevant to biodiversity conservation.
2. Timeline for completing the review of existing policies and instruments related to biodiversity incentives.
3. Timeline for prioritizing incentives that support biodiversity-positive outcomes.
4. Timeline for submitting recommendations for need-based repurposing of incentives with potential harmful impacts on biodiversity.

19 BY 2025, RESOURCES TO SUPPORT IMPLEMENTATION OF NBSAP ARE MOBILIZED

RATIONALE

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

Despite Bhutan's strong conservation record, inadequate and fragmented financing remains a persistent barrier to effective biodiversity implementation. Past reviews of BAPs and NBSAPs have repeatedly identified limited financial resources as a major constraint. With expanding development needs and a shifting global funding landscape, there is a growing need to diversify and scale up investment in biodiversity and climate action.

Aligned with the GBF Target 19, this target focuses on developing a comprehensive Resource Mobilization Plan to strengthen multisectoral collaboration and strategically leverage both traditional and innovative financing mechanisms to secure long-term conservation funding.

STRATEGIES	ACTIONS
Strategy 19.1. Enhance Resource Mobilization for effective implementation of the NBSAP.	*Action 19.1.1. Conduct resource mobilization consultation meetings to improve coordination among relevant stakeholders.* *Action 19.1.2. Carry out donor mapping and develop a potential donor database.*

Strategy 19.2. Explore new and innovative financing mechanisms for biodiversity conservation.

Action 19.2.1: Conduct an assessment of the Biodiversity and Environmental Finance gap.

Action 19.2.2: Identify new and innovative financing solutions for biodiversity conservation, such as the Bhutan carbon market, biodiversity credits, wildlife credits, green bonds, PES, and bioprospecting.

Action 19.2.3: Develop a resource mobilization plan for implementation of the NBSAP.

Action 19.2.4: Implement the resource mobilization plan.

Indicators:

1. Timeline for conducting an assessment of the biodiversity and environment finance gap.
2. Timeline for developing a resource mobilization plan to support NBSAP implementation.
3. Number of innovative financing mechanisms initiated to support biodiversity conservation and sustainable use.

20 BY 2030, STRENGTHEN CAPACITY BUILDING, PROMOTE TECHNOLOGY TRANSFER, AND FACILITATE TECHNICAL AND SCIENTIFIC COOPERATION

RATIONALE

Limited institutional, technical, and human capacity remains a key barrier to effective biodiversity implementation in Bhutan. Past reviews of BAPs and the NBSAP have consistently flagged capacity constraints, weak mainstreaming, and low public awareness as cross-cutting challenges.

While institutional frameworks have strengthened over time, translating strategies into impactful outcomes requires a skilled workforce, modern infrastructure, and access to emerging technologies. Gaps also remain in cross-sectoral coordination, data systems, and community engagement.

Aligned with the GBF Target 20, this target aims to enhance institutional and human capacity through a national biodiversity capacity needs assessment and action plan. It also supports technology transfer, scientific cooperation, and the adoption of emerging tools for biosafety, sustainable use, and monitoring, strengthened through regional and international collaboration.

ALIGNMENT WITH NATIONAL AND GLOBAL GOALS

STRATEGIES	ACTIONS
Strategy 20.1. Enhance knowledge and understanding of biodiversity conservation.	*Action 20.1.1: Develop a Communication, Education and Public Awareness Action (CEPA) Plan for effective implementation of NBSAP (refer Table 3).* *Action 20.1.2: Implement the Communication, Education and Public Awareness Action Plan.*

Strategy 20.2. Enhance the technical capacity of the relevant stakeholders for biodiversity conservation.	*Action 20.2.1: Conduct Capacity Needs Assessment for effective implementation of the NBSAP.* *Action 20.2.2: Develop a Capacity Development Action Plan for effective implementation of the NBSAP (refer Table 4).* *Action 20.2.3: Implement the Capacity Development Action Plan.*
Strategy 20.3. Promote access to and transfer of technology.	*Action 20.3.1: Identify and adopt the best available technologies for conservation and sustainable use of biodiversity.* *Action 20.3.2: Establish a technology hub for the exchange of information on the best available technologies.*
Strategy 20.4. Facilitate technical and scientific cooperation for biodiversity conservation.	*Action 20.4.1: Institute a networking forum for scientific cooperation and partnership on biodiversity conservation.* *Action 20.4.2: Initiate cooperation and partnership with institutions in the region and beyond for mutual collaboration (refer Table 5).*

Indicators:

1. Number of inclusive awareness programs conducted on biodiversity conservation and sustainable natural resource management.
2. Number of technical capacity-building programs conducted for relevant stakeholders across sectors.
3. Timeline for establishing biodiversity-focused technology hubs and knowledge-sharing platforms.
4. Number of initiatives undertaken to promote technical and scientific cooperation for biodiversity conservation.

Table 3. INDICATIVE LIST OF TARGETED AWARENESS PROGRAMS NEEDED FOR THE SUCCESSFUL IMPLEMENTATION OF THE NBSAP

1. Conduct awareness on the ABS policy and legal framework.
2. Conduct awareness on NLUZ guidelines.
3. Conduct awareness on the significance of rehabilitation and restoration efforts for degraded areas.
4. Conduct awareness on human-wildlife coexistence and its mitigation measures.
5. Conduct awareness on the illegal and unsustainable harvesting of wild species.
6. Conduct awareness on the IAS and its impact on biodiversity.
7. Conduct awareness on the pollution abatement.
8. Conduct awareness on the policy and legal framework of biosafety legislation and measures.
9. Conduct awareness on citizen science and citizen participation in the Bhutan Biodiversity Portal.
10. Conduct awareness on the importance of gender perspective in biodiversity conservation.
11. Create adequate awareness of NBSAP among national, sectoral, and local stakeholders.
12. Raise awareness and educational programs on SCP.
13. Conduct awareness on the Nagoya-Kuala Lumpur Supplementary Protocol and its implementation requirements.

TABLE 4. INDICATIVE LIST OF PROPOSED CAPACITY-BUILDING INTERVENTIONS FOR EFFECTIVE IMPLEMENTATION OF BHUTAN'S NBSAP

1. Enhance technical capacity of the relevant stakeholders for biodiversity conservation.
2. Conduct capacity building for enforcement officials and agencies on the detection of Invasive Alien Species.
3. Conduct capacity building of technical personnel on the impacts of climate change on agriculture, livestock, and forests.
4. Build capacity development on gender mainstreaming into biodiversity conservation.
5. Build capacity on emerging technology for assessment, management, and monitoring of forest and agricultural resources.
6. Conduct capacity-building programs on ABS.
7. Conduct capacity-building programs for nature tour guides and local youths.
8. Conduct training on sampling, detection, quantification, and risk management of GMOs, Biosafety Clearing House (BCH), Clustered Regularly Interspaced Short Palindromic Repeats-CRISPR associated protein 9 (CRISPR-Cas9) technology.
9. Conduct a capacity building program on nature-based solutions.
10. Conduct capacity building on economic valuation and environmental economic accounting.

11. Conduct capacity building of the urban planners, architects, and landscape designers, including decision-makers on biodiversity conservation.
12. Develop capacities in biodiscovery research to a level of identification of active pharmaceutical ingredients.
13. Conduct capacity building for enforcement officials and agencies on the detection of Invasive Alien Species.
14. Conduct capacity building of technical personnel on the impacts of climate change on agriculture, livestock, and forests.
15. Conduct capacity development programs on gender mainstreaming into biodiversity conservation.
16. Build capacity on emerging technology for assessment, management, and monitoring of forest and agricultural resources.
17. Conduct capacity-building programs on ABS.
18. Conduct capacity-building programs for nature tour guides and local youths.
19. Conduct training on sampling, detection, quantification, and risk management of GMOs, Biosafety Clearing House (BCH), Clustered Regularly Interspaced Short Palindromic Repeats-CRISPR associated protein 9 (CRISPR-Cas9) technology.
20. Conduct a capacity building program on nature-based solutions.
21. Conduct capacity building on economic valuation and environmental economic accounting.
22. Conduct capacity building of the urban planners, architects, and landscape designers, including decision-makers on biodiversity conservation.
23. Develop capacities in biodiscovery research to a level of identification of active pharmaceutical ingredients.

TABLE 5. INDICATIVE LIST OF TARGETED TECHNICAL AND SCIENTIFIC COOPERATION PRIORITIES TO SUPPORT THE IMPLEMENTATION OF THE NBSAP

1. Establish forums for networking and knowledge exchange among organizations, government agencies, and local communities.
2. Establish or strengthen partnerships among institutions and local communities for research, co-design, and implement biodiversity conservation initiatives.
3. Establish or strengthen cooperation and partnerships with institutions in the region and beyond for knowledge sharing, technology adoption, and resource mobilization.

CHAPTER 5 NBSAP IMPLEMENTATION FRAMEWORK

(Courtesy: Karma C. Nyedrup)

This chapter outlines the institutional framework for coordinating, implementing, and monitoring Bhutan's National Biodiversity Strategy and Action Plan (NBSAP).

Photo: High Altitude Lake
(Courtesy: UNDP)

5.1 NATIONAL COORDINATION MECHANISM

Biodiversity conservation in Bhutan is inherently cross-sectoral, with responsibility shared across multiple government agencies and stakeholder groups. While this multi-actor structure is essential, it has also resulted in siloed implementation, overlapping mandates, and limited progress in achieving biodiversity targets. A key gap identified in the implementation of the previous NBSAP was the absence of clear ownership and coordination at the national, sectoral, and local levels. This has contributed to inefficiencies, duplication of efforts, and underperformance in key areas, resulting in underachievement of the NBSAP activities.

The Biodiversity Act of Bhutan 2022 entrusts the Competent National Authority (CNA) with the responsibility of ensuring the timely revision of the NBSAP. The Act also designates the NBC as the National Focal Point (NFP) for the implementation of the Act, with the coordination of the implementation of NBSAP as one of its key functions.

Therefore, for the effective implementation of the NBSAP, a National Coordination Committee will be instituted by the NBC, with membership comprising heads of the relevant stakeholders. The head of the NBC will function as the member secretary to the committee and will be supported by a permanent NBSAP coordination, monitoring and evaluation unit to be established at NBC.

5.2 DIVISION OF RESPONSIBILITY FRAMEWORK (DORF)

To ensure accountability and clarity in implementation, a Division of Responsibility Framework (see Annexure 2) is developed. The framework identifies the lead and collaborating agencies for each action within the targets and will be implemented following the NBSAP Implementation Plan (see Annexure 3). The plan defines the budget requirements and timelines associated with each action. An additional Technical Working Committee (TWC) will be established with representation from the lead agencies identified in the Division of Responsibility Framework (DoRF). NBSAP unit at NBC will lead the formation of TWC and function as the secretariat to this committee.

5.3 MONITORING, EVALUATION AND REPORTING

Monitoring and evaluation of the NBSAP will be conducted in line with the M&E framework (see Annexure 4), which outlines specific indicators for each action under the respective targets. The framework provides detailed descriptions of indicators, baseline data, targets, means of verification, and reporting frequencies.

The NBSAP unit at NBC will lead the monitoring and evaluation process, supported by the TWC. The evaluation report will be submitted to the National Coordination Committee for endorsement and to guide necessary interventions for the effective implementation of the NBSAP. Once endorsed, the evaluation report will also serve as the basis for preparing the national report on NBSAP implementation.

The DECC, as the current National Focal Point to the CBD, is responsible for fulfilling the country's reporting obligations to the CBD. The National Focal Point will continue to carry out this role.

5.4 CLEARING HOUSE MECHANISM

The Clearing House Mechanism (CHM) is housed within the DECC. The CHM will be used as a platform to update and report on the status of NBSAP implementation. It will also provide information on the global processes and program of works and other national obligations under CBD.

5.5 RESOURCE MOBILIZATION

Limited financial resources, exacerbated by untargeted allocation, have been the major constraints in the effective implementation of the past NBSAPs. To address these issues, a comprehensive Resource Mobilisation Plan is currently under preparation and is expected to be completed by the end of 2025. While the Resource Mobilisation Plan will provide a foundational framework, NBSAP implementation will not be limited to it, but will adapt to evolving funding opportunities and needs.

5.6. CAPACITY DEVELOPMENT

Capacity constraints have been consistently highlighted in past NBSAP reviews as a major barrier to the effective implementation of NBSAP targets. To address this issue, the capacity for the implementation of the current NBSAP will be developed following the Capacity Development Plan.

SUPPLEMENTARY NOTE: STAKEHOLDER ENGAGEMENT AND CONSULTATION PROCESS FOR NBSAP REVIEW

The draft NBSAP underwent comprehensive consultations at the national and regional levels to solicit feedback from diverse stakeholders across the country.

REGIONAL CONSULTATIONS

From 15 January to 5 February 2025, four regional consultations were conducted in Tashigang, Trongsa, Punakha, and Paro, covering all 20 *Dzongkhags*. These sessions brought together officials from agriculture, livestock, land records, environment, education, planning, agricultural marketing, engineering, and finance sectors. Participants also included representatives from *Thromdes*, local governments, community-based organizations, central programs and farms, Forest and Park offices, BFDA field offices and monastic bodies.

PRIVATE SECTOR CONSULTATION

A targeted consultation with key private sector representatives was held in Phuentsholing on 5 March 2025. This dedicated session provided space to incorporate perspectives from industries and businesses that play a significant role in biodiversity conservation and sustainable development.

NATIONAL-LEVEL CONSULTATION

A final national-level consultation was convened in Thimphu with Heads of Agencies from key ministries, departments, and Civil Society Organizations (CSOs). This session reviewed the consolidated draft NBSAP following the integration of feedback from regional and private sector consultations.

SYSTEMS MAPPING AND THEMATIC PLANNING

In parallel, a systems mapping workshop was organized with key stakeholders to identify systemic barriers and interlinkages that may affect the effective implementation of the NBSAP.

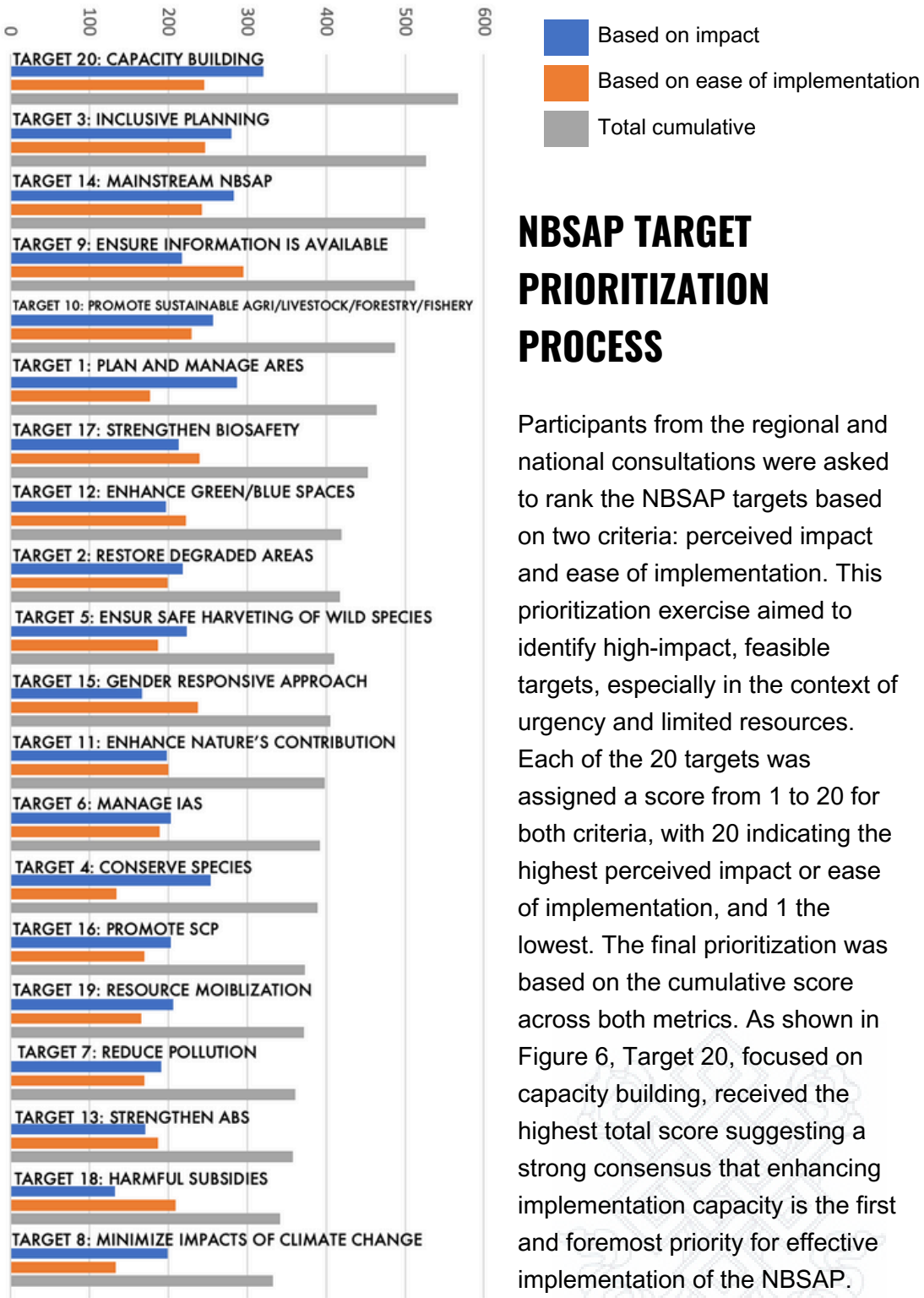


Figure 5. Prioritization results of the NBSAP targets

NBSAP TARGET PRIORITIZATION PROCESS

Participants from the regional and national consultations were asked to rank the NBSAP targets based on two criteria: perceived impact and ease of implementation. This prioritization exercise aimed to identify high-impact, feasible targets, especially in the context of urgency and limited resources. Each of the 20 targets was assigned a score from 1 to 20 for both criteria, with 20 indicating the highest perceived impact or ease of implementation, and 1 the lowest. The final prioritization was based on the cumulative score across both metrics. As shown in Figure 6, Target 20, focused on capacity building, received the highest total score suggesting a strong consensus that enhancing implementation capacity is the first and foremost priority for effective implementation of the NBSAP.

Annexure 1: Alignment of Bhutan's NBSAP Targets with the Kunming-Montreal Global Biodiversity Framework (KMGBF) Targets

BHUTAN'S NBSAP TARGET	KUNMING-MONTREAL GLOBAL BIODIVERSITY FRAMEWORK TARGET
NATIONAL TARGET 1: BY 2030, PLAN AND MANAGE ALL AREAS TO REDCUDE BIODIVERSITY LOSS	**TARGET 1**: PLAN AND MANAGE ALL AREAS TO REDUCE BIODIVERSITY LOSS **TARGET 3**: CONSERVE 30% OF LAND, WATERS AND SEAS
NATIONAL TARGET 2: BY 2020, ENSURE AT LEAST 10% OF DEGRADED AREAS ARE BROUGHT UNDER EFFECTIVE RESTORATION	**TAREGT 2**: RESTORE 30% OF ALL DEGRADED ECOSYSTEM
NATIONAL TARGET 3: BY 2030, STRENGTHEN INCLUSIVE PARTICIPATION IN BIODIVERSITY RELATED DECISION-MAKING PROCESSES	**TARGET 22**: ENSURE PARTICIPATION IN DECISION-MAKING AND ACCESS TO JUSTICE AND INFORMATION RELATED TO BIODIVERSITY FOR ALL
NATIONAL TARGET 4: BY 2030, MAINTAIN THE POPULATION OF THREATENED SPECIES, CONSERVE GENETIC DIVERSITY AND MANAGE HUMAN-WILDLIFE CONFLICT	**TARGET 4**: HALT SPECIES EXTINCTION, PROTECT GENETIC DIVERSITY, AND MANAGE HUMAN-WILDLIFE CONFLICTS
NATIONAL TARGET 5: BY 2030, ENSURE SAFE AND LEGAL HARVESTING OF WILD SPECIES FOR SOCIAL, ECONOMIC, AND ENVIRONMENTAL BENEFITS IN A SUSTAINABLE MANNER	**TARGET 5**: ENSURE SUSTAINABLE, SAFE AND LEGAL HARVESTING AND TRADE OF WILD SPECIES **TARGER 9**: MANAGE WILD SPECIES SUSTAINABLY TO BENEFIT PEOPLE
NATIONAL TARGET 6: BY 2030, MANAGE INVASIVE ALIEN SPECIES TO MINIMIZE THEIR IMPACTS ON BIODIVERSITY	**TAREGT 6**: REDUCE THE INTRODUCTION OF INVASIVE ALIEN SPECIES BY 50% AND MINIZE THEIR IMPACT
NATIONAL TARGET 7: BY 2030, ENSURE REDUCTION IN POLLUTION TO MINIMIZE THREATS TO BIODIVERSITY	**TARGET 7**: REDUCE POLLUTION TO LEVELS THAT ARE NOT HARMFUL TO BIODIVERSITY
NATIONAL TARGET 8: BY 2030, MINIMIZE THE ADVERSE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE	**TARGET 8**: MINIMIZE THE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE
NATIONAL TARGET 9: BY 2030, ENSURE THAT INFORMATION AND KNOWLEDGE RELATED TO BIODIVERSITY ARE AVAILABLE AND ACCESSIBLE	**TARGET 21**: ENSURE THAT KNOWLEDGE IS AVAILABLE AND ACCESSIBLE TO GUIDE BIODIVERSITY ACTION
NATIONAL TARGET 10: BY 2030, ENSURE THAT AREAS UNDER AGRICULTURE, LIVESTOCK, FISHERIES, AND FORESTRY ARE MANAGED SUSTAINABLY FOR FOOD SECURITY AND LIVELIHOOD	**TARGET 10**: ENHANCE BIODIVERSITY AND SUSTAINABILITY IN AGRICULTURE, FISHERIES, AND FORESTRY

NATIONAL TARGET 11: BY 2030, MAINTAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE	**TARGET 11**: RESTORE, MAIN TAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE
NATIONAL TARGET 12: BY 2020, ENHANCE AND/OR PLAN GREEN AND BLUE SPACES IN URBAN AREAS FOR SOCIAL WELL-BEING AND BIODIVERSITY CONSERVATION	**TAREGT 12**: ENHANCE GREEN SPACES AND URBAN PLANNING FOR HUMAN WELL-BEING AND BIODIVERSITY
NATIONAL TARGET 13: BY 2030, INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE ASSOCIATED WITH BIOLOGICAL RESOURCES	**TARGET 13**: INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE
NATIONAL TARGET 14: BY 2030, ENHANCE MAINSTREAMING AND INTEGRATION OF NBSAP INTO NATIONAL, SECTORAL, AND LOCAL PLANS	**TARGET 14**: INTEGRATE BIODIVERSITY IN DECISION-MAKING AT EVERY LEVEL
NATIONAL TARGET 15: BY 2030, ENSURE ENDER EQUALITY AND GENDER-RESPONSIVE APPROACH IN BIODIVERSITY ACTIONS	**TARGET 23**: ENSURE GENDER EQUALITY AND GENDER-RESPONSIVE APPROACH FOR BIODIVERSITY ACTION
NATIONAL TARGET 16: BY 2030, PROMOTE SUSTAINABLE CONSUMPTION AND PRODUCTION TO REDUCE WASTE	**TAREGT 16**: ENABLE SUSTAINABLE CONSUMPTION CHOICES TO REDUCE WASTE AND OVERCONSUMPTION **TARGET 15**: BUSINESSES ASSESS, DISCLOSE AND REDUCE BIODIVERSITY-RELATED RISKS AND NEGATIVE IMPACTS
NATIONAL TARGET 17: BY 2030, STRENGTHEN IMPLEMENTATION OF BIOSAFETY MEASURES	**TARGET 17**: STRENGTHEN BIOSAFETY AND DISTRIBUTE THE BENEFITS OF BIOTECHNOLOGY
NATIONAL TARGET 18: BY 2030, STRATEGIC INTERVENTIONS ON INCENTIVES ARE STREAMLINED TO SAFEGUARD BIODIVERSITY	**TARGET 18**: REDUCE HARMFUL INCENTIVES BY AT LEAST $500 BILLION PER YEAR, AND SCALE UP POSITIVE INCENTIVES FOR BIODIVERSITY
NATIONAL TARGET 19: BY 2026, RESOURCES TO SUPPORT IMPLEMENTATION OF NBSAP ARE MOBILIZED	**TARGET 19**: MOBILIZE $200 BILLION PER YEAR FOR BIODIVERSITY FROMAL ALL SOURCES , INCLUDING $30 BILLION THROUGH INTERNATIONAL FINANCE
NATIONAL TARGET 20: BY 2030, STRENGTHEN CAPACITY BUILDING, PROMOTE TECHNOLOGY TRANSFER, AND FACILITATE TECHNICAL AND SCIENTIFIC COOPERATION	**TARGET 20**: STRENGTHEN CAPACITY-BUILDING, TECHNOLOGY TRANSFER AND SCIENTIFIC AND TECHNICAL COOPERATION FOR BIODIVERSITY

Annexure 2: Division of Responsibility Framework for NBSAP Implementation

Outputs	Lead Agency	Collaborating Partners
NATIONAL TARGET 1: BY 2030, PLAN AND MANAGE ALL AREAS TO REDUCE BIODIVERSITY LOSS		
Strategy 1.1. Accelerate the implementation of comprehensive land-use zoning.		
Action 1.1.1. Update parameterization in the National Land Use Zoning (NLUZ) system to guide land use decisions prioritizing biodiversity conservation areas.	NLC	DoFPS, DoA, NBC, DoL, MoIT, RSPN, DoW
Action 1.1.2. Develop strategy/guidelines with key recommendations for protection of prime traditional paddy fields to ensure wetland (Chhuzhing) and agrobiodiversity conservation.	DoA	NLC, NBC, LG
Strategy 1.2. Strengthen knowledge of biodiversity in areas of high ecological importance.		
Action 1.2.1. Assess and update the status of biodiversity in biological corridors and/or one freshwater ecosystems.	DoFPS	DoW, RSPN, RUB,NBC, DoL
Action 1.2.2. Update and incorporate spatial biodiversity data into the NLUZ.	NLC	DoA, DoL, MoIT, RSPN, DoFPS, NBC
Strategy 1.3. Enhance management of areas of high ecological importance.		
Action 1.3.1. Update and/or develop management plans for PA and OECMs.	DoFPS	RSPN, LG, BFL

Action 1.3.2. Implement management plans for PAs and OECMs.	DoFPS	NBC, DoA, RSPN, DoL, DoW, LG, BFL
Action 1.3.3. Assess management effectiveness of PAs and other managed forest areas using Bhutan management effectiveness tracking tool plus (METT+).	DoFPS	BFL, LG
Action 1.3.4. Institute river rangers and SMART patrolling program to protect freshwater biodiversity.	DoFPS	RSPN, GovTech, NSB
Action 1.3.5. Develop management plans for key agrobiodiversity sites.	NBC	DoA, DoL, Tarayana Foundation, RSPN
Action 1.3.6. Conduct nationwide water resource inventory.	DoW	DoFPS, LG, RSPN
Action 1.3.7. Develop at least one river basin management plan.	DoW	DoFPS, LG, NCHM, MoIT
NATIONAL TARGET 2: BY 2030, ENSURE AT LEAST 10% OF DEGRADED AREAS ARE BROUGHT UNDER EFFECTIVE RESTORATION		
Strategy 2.1. Strengthen institutional coordination framework for restoration program.		
Action 2.1.1. Institute a multisectoral committee on restoration and rehabilitation to improve coordination.	DoFPS	DoA, DoL, DoW, GBCL, DGM

Strategy 2.2. Ensure degraded areas are brought under restoration for biodiversity conservation.		
Action 2.2.1. Develop a guideline for restoration and rehabilitation of degraded areas including rangeland.	DoFPS	DoA, DoW, GBCL, DGM, DoL
Action 2.2.2. Conduct rangeland resource mapping.	DoL	DoFPS, NLC
Action 2.2.3. Identify and map degraded areas to establish baseline data.	DoFPS	DoA
Action 2.2.4. Implement restoration or rehabilitation activities in at least 10% of degraded areas.	DoFPS	BES, RSPN, DoA, DoL, DoW, DGM
NATIONAL TARGET 3: BY 2030, STRENGTHEN INCLUSIVE PARTICIPATION IN BIODIVERSITY RELATED DECISION-MAKING PROCESSES		
Strategy 3.1. Ensure inclusive stakeholder participation at all levels.		
Action 3.1.1. Develop a guideline for inclusive participation in biodiversity related decision-making, considering diverse genders and groups.	NBC	NCWC, RENEW, Tarayana and other related NGO/CSO, MoAL, MoENR, MoIT, DPO
Action 3.1.2. Develop a standard mechanism to monitor inclusive participation in biodiversity-related decision-making.	NBC	NCWC , LG , DPO, RSPN

NATIONAL TARGET 4: BY 2030, MAINTAIN THE POPULATION OF THREATENED SPECIES, CONSERVE GENETIC DIVERSITY AND MANAGE HUMAN-WILDLIFE CONFLICT		
Strategy 4.1. Strengthen conservation of threatened species.		
Action 4.1.1. Develop/Update baseline data for invertebrate, fish, herpetofauna, bryophytes, fungi and soil microbes.	NBC	DoFPS, DoL, RUB, DoA
Action 4.1.2. Update the National Red List of species.	NBC	DoFPS, DoL, RUB, RSPN, DoA
Action 4.1.3. Develop and implement species-specific conservation action plans for at least two threatened species.	DoFPS	DoL, RSPN, NBC
Action 4.1.4. Explore and use emerging technologies for monitoring threatened species.	DoFPS	NBC, DoA, DoL, RSPN, RUB
Stratgy 4.2. Strengthen conservation of genetic diversity of threatened species.		
Action 4.2.1: Expand and/or establish biorepositories and genebanks.	NBC	DoFPS, DoL, DoA, RUB, RSPN, Tarayana, LG
Action 4.2.2: Conduct an inventory of crop wild relatives for conservation.	NBC	DoFPS, DoA, LG

Action 4.2.3: Develop and implement conservation action plans for native livestock species.	NBC	DoL
Action 4.2.4: Initiate germplasm conservation of key wildlife species.	NBC	DoFPS, RSPN
Action 4.2.5. Strengthen conservation breeding programs of the critically endangered White-bellied Heron.	RSPN	DoFPS, NBC, LG
Strategy 4.3. Strengthen Human-Wildlife Conflict Management initiatives.		
Action 4.3.1: Update Human-Wildlife Conflict hotspot map.	DoFPS	DoL, DoA, WWF, RSPN, BES, LG
Action 4.3.2: Develop a holistic management plan to effectively manage human-wildlife conflict in strategic HWC hotspot areas.	DoFPS	DoL, DoA, WWF, RSPN, BES
Action 4.3.3: Implement innovative interventions for protection against wildlife.	DoA	DoFPS, WWF, RSPN, BES, DoL, DoFPS, LG, Tarayan Foundation
Action 4.3.4: Institute crop and livestock insurance scheme at national level.	MoAL	DoFPS, WWF, RSPN, BES, UNDP, Tarayana Foundation
Action 4.3.5: Strengthen one health program linking biodiversity conservation, human and animal health.	One Health Secretariat, MoH	DoFPS, DoL, DoPH, BFDA, Bhutan Toilet Organization

NATIONAL TARGET 5: BY 2030, ENSURE SAFE AND LEGAL HARVESTING OF WILD SPECIES FOR SOCIAL, ECONOMIC, AND ENVIRONMENTAL BENEFITS IN A SUSTAINABLE MANNER		
Strategy 5.1. Strengthen sustainable utilization of economically important wild species.		
Action 5.1.1. Conduct resource assessment of economically important wild species, including those used in Bhutanese Traditional Medicine (Sowa Rigpa).	DoFPS	MSPCL, NBC, DoA, BFL, RUB, MoH (DTM)
Action 5.1.2. Carry out domestication trial for atleast one identified species.	DoA	DoFPS, NBC, MSPCL, BFL, RUB
Action 5.1.3. Review and recommend amendment of the Forest and Nature Conservation Rules and Regulations 2023 to incorporate emerging trade of wild species.	DoFPS	NBC, BFDA, DoA, DECC, MoICE, LG, RSPN, BES, Private sectors.
Action 5.1.4. Update guidelines for sustainable utilization of economically important wild species, integrating biodiversity and health.	DoFPS	NBC, DoFPS, RUB, BFL, DOA, DoL
Action 5.1.5. Update or develop community-based management plans for sustainable management and harvesting of wild species.	DoFPS	DoA, NBC, RUB, BFL, DoL, RSPN, BES
Action 5.1.6. Enforce effective compliance monitoring of illegal collection of wild species.	DoFPS	NBC, ICP, DRC, BFDA, DoA

NATIONAL TARGET 6: BY 2030, MANAGE INVASIVE ALIEN SPECIES TO MINIMIZE THEIR IMPACTS ON BIODIVERSITY		
Strategy 6.1. Strengthen coordination mechanisms for the management of IAS.		
Action 6.1.1. Review existing legislation to streamline roles and responsibilities for coordinated management of IAS.	NBC	BFDA, RUB, DECC, DoL, DoA, DoFPS, RSPN, BES, Tarayana Foundation, ICP, LG
Action 6.1.2. Develop guidelines/SOP for effective management of the IAS pathways.	NBC	BFDA, RUB, DECC, DoL, DoA, DoFPS, ICP, LG
Action 6.1.3. Implement guidelines/SOP for management of IAS.	NBC	BFDA, RUB, DECC, DoL, DoA, DoFPS, ICP, LG
Strategy 6.2. Strengthen knowledge of IAS and its impacts.		
Action 6.2.1. Conduct research on the status of IAS pathways, distribution, and impact.	NBC	BFDA, RUB, DECC, DoL, DoA, DoFPS, ICP, LG
Action 6.2.2. Update and maintain the IAS database.	NBC	BFDA, RUB, DECC, DoL, DoA, DoFPS, RSPN, BES, Tarayana Foundation, ICP, LG, GovTech

NATIONAL TARGET 7: BY 2030, ENSURE REDUCTION IN POLLUTION TO MINIMIZE THREATS TO BIODIVERSITY		
Strategy 7.1. Enhance measures to mitigate pollution that have adverse impacts on biodiversity.		
Action 7.1.1. Identify major pollutants that have adverse impacts on biodiversity.	DECC	DoW, DoFPS, DoI, BES, RSPN, MoH, MoAL, BCTA, RRCO, MoHA, NSB, NBC, LG, GovTech, DHS, Clean Bhutan
Action 7.1.2. Identify and adopt state-of-the-art technologies to abate pollution.	DECC	DoW, DoFPS, DoI, RSPN, BES, UNDP, MoH, MoAL, BCTA,BTFEC, RRCO, BFDA, MoHA, NSB, NBC, LG, GovTech, MoIT, Clean Bhutan
Action 7.1.3. Update the existing Environmental Standards 2020 and the Initial Environmental Examination (IEE) guidelines 2020.	DECC	DoW, DoFPS, DoI, MoH, MoAL, BCTA, BTFEC, RRCO, MoHA, NSB, NBC, LG, GovTech, DHS
Strategy 7.2. Strengthen compliance monitoring of developmental activities that have adverse impacts on biodiversity.		
Action 7.2.1. Conduct annual compliance monitoring of developmental activities, among others, taking into consideration adverse impacts on biodiversity.	DECC	DoW, DoFPS, DoI, MoH, MoAL, BCTA, BTFEC, RRCO, MoHA, NSB, NBC, LG, GovTech, DHS
Action 7.2.2. Conduct gap assessment of the existing waste management facilities to ensure effective monitoring of environmental standards.	DECC	DoW, DoFPS, DoI, RSPN, BES, MoH, MoAL, BCTA, BTFEC, RRCO, MoHA, NSB, NBC, LG, GovTech, DHS, Clean Bhutan

NATIONAL TARGET 8: BY 2030, MINIMIZE THE ADVERSE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE		
Strategy 8.1. Enhance knowledge and understanding of the adverse impacts of climate change on biodiversity.		
Action 8.1.1. Conduct research on the adverse impacts of climate change on mountain biodiversity and develop policy briefs for informed decision-making.	DECC	RUB, DoFPS, DoW, DoA, DoL, NBC, NCHM, MoAL, MoH, BFDA, LG, Department of Education Program, RSPN, BES
Action 8.1.2. Implement recommendations based on the outcomes of the research.	DECC	RUB, DoFPS, DoW, DoA, DoL, NBC, NCHM, MoAL, MoH, BFDA, LG, Department of Education Program, NGO/CSO
Action 8.1.3. Organize at least one symposium/seminar/conference on mountain biodiversity, focusing on biodiversity and health, at the international level.	NBC	DECC, RUB, MoFAET, DoFPS, DoA, DoL, NGO/CSO
Strategy 8.2. Increase carbon sequestration and reduce emissions to uphold carbon neutrality.		
Action 8.2.1. Explore and adopt renewable energy sources to reduce carbon emissions.	DoE	NBC, DECC, DLGDM, BES, RSPN
Action 8.2.2. Upscale afforestation and reforestation programs.	DoFPS	GBCL, DECC, DGM, LG, BES, RSPN, BES, RSPN
Action 8.2.3. Strengthen forest fire prevention and management measures.	DoFPS	LG
Action 8.2.4. Develop guidelines for the scientific management of landfills to regulate GHG emissions.	DECC	LG, MoIT

Action 8.2.4. Foster regional and international collaborations for climate financing, carbon trading and REDD+ initiatives.	DECC	MoFAET, NBC, BTFEC, RSPN, BES, WWF, UNDP, DHI, DoFPS, MoF, NGO/CSO
NATIONAL TARGET 9: BY 2030, ENSURE THAT INFORMATION AND KNOWLEDGE RELATED TO BIODIVERSITY ARE AVAILABLE AND ACCESSIBLE		
Strategy 9.1. Strengthen biodiversity-related information and knowledge base.		
Action 9.1.1. Identify data gaps in biodiversity-related information and knowledge.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, RSPN,
Action 9.1.2. Conduct targeted biodiversity assessments to address data gaps.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, LG, DOFPS, DoA, DoL, DECC, RSPN,
Action 9.1.3. Develop SOPs for data collation, validation, and publication.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, WCD, DECC, RSPN
Action 9.1.4. Update the Bhutan Biodiversity Statistics.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, DECC, RSPN
Strategy 9.2. Enhance availability and accessibility of biodiversity-related information and knowledge.		
Action 9.2.1 Establish a national GBIF node to facilitate biodiversity data sharing and integration.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, DECC
Action 9.2.2. Upgrade the Bhutan Biodiversity Portal as a centralized biodiversity data repository.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, GovTech, RSPN

Action 9.2.3. Make Bhutan Biodiversity Portal website/app user friendly and accessible across multiple platforms.	NBC	DoFPS, RUB, DoA, DoL, DoW, BFDA, GovTech
NATIONAL TARGET 10: BY 2030, ENSURE THAT AREAS UNDER AGRICULTURE, LIVESTOCK, FISHERIES, AND FORESTRY ARE MANAGED SUSTAINABLY FOR FOOD SECURITY AND LIVELIHOOD		
Strategy 10.1. Strengthen sustainable agriculture and livestock practices.		
Action 10.1.1. Assess and promote new and improved crop and forage varieties, livestock and fish breeds.	DoA / DoL	BFDA, NBC
Action 10.1.2. Assess and promote improved livestock breeding and management practices, including herd health and farm biosecurity.	DoL	BFDA, NBC
Action 10.1.3 Upscale Sustainable Land Management (SLM) practices.	DoA	LG, Tarayana Foundation, RSPN, BES
Action 10.1.4 Develop Good Agricultural Practices (GAP) guidelines for prioritized agricultural commodities.	DoA	BSB, LG, DAMC
Action 10.1.5 Upscale fruit production to enhance livelihood.	DoA	Desuung, LG, BES, Tarayana Foundation, RSPN
Action 10.1.6 Conduct applied research to promote sustainable agriculture and livestock practices.	DoA / DoL	
Strategy 10.2. Promote agricultural innovation and technology.		
Action 10.2.1. Pilot hi-tech agriculture farms and precision livestock farming.	DoA / DoL	Desuung, LG, FMCL, Tarayana Foundation, RSPN, BES

Action 10.2.2. Develop improved pasture and agro-silvopasture system to enhance fodder availability.	DoL	LG, DoA
Action 10.2.3 Identify and adopt innovative technologies and approaches to improve soil fertility.	DoA	LG, RSPN, BES, Tarayan Foundation
Action 10.2.4. Improve surveillance systems for monitoring pests and transboundary animal diseases.	DoA / DoL	LG, BFDA
Action 10.2.5. Upscale water use efficiency technologies and climate-proof irrigation systems to build climate resilience.	DoA	DoID, LG, DoW, RSPN, BES, Tarayana Foundation
Action 10.2.6. Adopt climate-smart agriculture and livestock farming practices and innovations.	DoA / DoL	LG, DECC, WCD, RSPN, Tarayana Foundation
Strategy 10.3. Promote measures to mitigate crop and livestock damage against extreme climate conditions.		
Action 10.3.1. Strengthen agro-meteorological services through the Agromet Decision Support System (ADSS).	DoA	NCHM, LG
Action 10.3.2. Pilot index-based crop and livestock insurance scheme to enhance adaptation to climate change impacts.	MoAL	LG, DoFPS, RSPN
Strategy 10.4. Strengthen sustainable management of forest resources.		
Action 10.4.1. Bring additional unmanaged State Reserved Forest land under sustainable forest management regimes.	DoFPS	LG
Action 10.4.2. Develop and implement management plans for Community Forests (CF), Local Forest Management Plan (LFMP), and Forest Management Units (FMU).	DoFPS	LG, NRDCL, RSPN, BES

Strategy 10.5. Strengthen sustainable management of fishery resources.		
Action 10.5.1. Upscale recreational fishery programs.	DoFPS	DoL, DoT, LG
Action 10.5.2. Revive existing and develop new community-based fisheries management programs.	DoL	DoFPS, LG
NATIONAL TARGET 11: BY 2030, MAINTAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE		
Strategy 11.1. Promote nature-based solutions and ecosystem-based approaches.		
Action 11.1.1. Explore and adopt nature-based solutions in climate adaptation and mitigation, disaster risk reduction, including forest fires, water and food security, habitat restoration, and socio-economic benefits and livelihood.	DECC	NBC, DoFPS, DoA, DLGDM, DoW, DoL, LG, DoT, RSPN, BES, Tarayana Foundation
Action 11.1.2. Implement at least two nature-based solutions related to biodiversity conservation and sustainable livelihood.	DoFPS	NBC, DoA, DoL, LG, DECC, MoIT, RSPN, BES, Tarayana Foundation
Action 11.1.3. Explore and initiate isolation and identification of beneficial soil microbes and insects for biofertilizer production and bioprospecting.	DoA	NBC
Strategy 11.2. Mainstream economic value of ecosystem services into the national accounting system.		
Action 11.2.1. Implement the National Implementation Plan for the System of Environmental-Economic Accounting (SEEA) in Bhutan (2024-2029).	NSB	DoFPS, DoA, DoL, NBC, DECC, DoW, DoE, DGM, LG

NATIONAL TARGET 12: BY 2030, ENHANCE AND/OR PLAN GREEN AND BLUE SPACES IN AREAS FOR SOCIAL WELL-BEING AND BIODIVERSITY CONSERVATION		
Strategy 12.1. Strengthen biodiversity-inclusive urban planning and development.		
Action 12.1.1. Develop frameworks/guidelines for inclusive planning, management, and monitoring of green and blue spaces.	MoIT	Thromde, LG, WCD
Action 12.1.2. Conduct inventory of existing green and blue spaces, focusing on urban areas.	MoIT	LG, DoFPS, DoW, NBC,
Action 12.1.3. Establish and/or maintain green and blue spaces in Thromdes, taking into consideration people with special needs.	MoIT	LG, NBC, BES, Ability Bhutan Society, Bhutan Red Cross Society
Action 12.1.4. Develop City Biodiversity Index in at least two Thromdes.	NBC	MoIT, LG, DECC
Action 12.1.5. Conduct research to evaluate the health and biodiversity value of green and blue spaces.	NBC	LG, MoIT, RUB, DoA, BES, RSPN, Tarayana Foundation
Action 12.1.6. Revise the Building Codes of Bhutan to incorporate the concept of green and blue spaces in urban planning.	MoIT	LGs

NATIONAL TARGET 13: BY 2030, INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE ASSOCIATED WITH BIOLOGICAL RESOURCES		
Strategy 13.1. Strengthen the coordination mechanism for the implementation of the Access and Benefit Sharing regime to ensure fair and equitable sharing of benefits and prevention of misappropriation.		
Action 13.1.1. Develop Communication, Education and Public Awareness Strategy on Access and Benefit Sharing.	NBC	DECC, BFDA, RUB, RSPN, Tarayana Foundation, BES, Youth Development Fund, Bhutan Media Foundation, Nazhoen Lamtoen, DSE, DoT, GAB
Action 13.1.2. Enforce the Biodiversity Act of Bhutan 2022 and Biodiversity Rules and Regulations 2023 to ensure fair and equitable sharing of benefits and prevent misappropriation.	NBC	DECC, BFDA, ICP
Action 13.1.3. Participate in regional and international fora on Access and Benefit Sharing to foster institutional linkages.	NBC	DECC, BFDA, MFAET
Action 13.1.4. Upscale Bioprospecting and Access and Benefit Sharing initiatives, and explore branding and certification of bioprospecting-based products.	NBC	DoFPS, MSPCL, Private Sectors, Local Communities, RUB, DoA, DoMCIIP, BCCI
Action 13.1.5. Establish a Bhutan Access and Benefit Sharing Clearing House Mechanism.	NBC	GovTech Agency, DECC, BFDA

Action 13.1.6. Develop a strategy to make the Bhutan Access and Benefit Sharing fund innovative and sustainable.	NBC	MoF
Strategy 13.2. Strengthen the repository on Traditional Knowledge associated with biological resources and customary practices relevant to biodiversity conservation and sustainable use.		
Action 13.2.1. Document traditional knowledge associated with biological resources and customary practices relevant to biodiversity conservation and sustainable use.	NBC	DoFPS, DoA, DoL, MSPCL, MoH (DTM), RUB, DoC, DoMCIIP
Action 13.2.2. Develop a strategy for the protection and appropriate utilization of traditional knowledge associated with biological resources.	NBC	DoFPS, DoA, DoL, MSPCL, MoH (DTM), RUB, DOC, DoMCIIP
NATIONAL TARGET 14: BY 2030, ENHANCE MAINSTREAMING AND INTEGRATION OF NBSAP INTO NATIONAL, SECTORAL, AND LOCAL PLANS		
Strategy 14.1. Mainstream NBSAP into policies, strategies, plans and programs.		
Action 14.1.1. Endorse NBSAP as the national guiding document.	DECC	NBC

Action 14.1.2. Establish a multi-sectoral committee or entrust the responsibility to one of the relevant existing committees to oversee the implementation of NBSAP.	NBC	NBC, MoF, MoENR, MoH
Action 14.1.3. Conduct sector-specific workshops to identify entry points for NBSAP targets, and incorporate relevant actions into the sector plans.		
Action 14.1.4. Align the Nationally Determined Contributions (NDC) 3.0 with the fifth NBSAP to integrate biodiversity considerations into climate commitments.	DECC	MoAL, MoESD, MoF, MoH, MoIT,
NATIONAL TARGET 15: BY 2030, ENSURE GENDER EQUALITY AND GENDER-RESPONSIVE APPROACH IN BIODIVERSITY ACTIONS		
Strategy 15.1. Promote gender-responsive approaches in biodiversity conservation programs.		
Action 15.1.1. Conduct gender analysis in biodiversity conservation programs to assess and address gender-specific gaps and opportunities.	WCD	NBC, DECC, UNDP, MoAL
Action 15.1.2. Develop gender and biodiversity action plan.	WCD	NBC, DECC, DoFPS, MoAL, UNDP
Action 15.1.3. Implement gender and biodiversity action plan.	NBC	MoAL, DECC, DoFPS, NCWC, RSPN, BES
Action 15.1.4. Assess the implementation of gender and biodiversity actions.	NBC	NCWC, DoFPS, DECC, DoA, DoL

NATIONAL TARGET 16: BY 2030, PROMOTE SUSTAINABLE CONSUMPTION AND PRODUCTION TO REDUCE WASTE		
Strategy 16.1. Promote Sustainable Consumption and Production to minimize waste.		
16.1.1. Institute a compliance monitoring mechanism to minimize waste at source.	DECC	DHS, LG, DoL, DoFPS, MoAL, DoPH, BCCI
Action 16.1.2. Explore and implement Extended Producer Responsibility (EPR) to reduce waste.	DECC	DHS, LG, DoI, DoFPS, DoW, RRCO, BCCI, Private entities,
Action 16.1.3. Explore and implement Public-Private Partnership in waste reduction and management.	DECC	DHS, RSPN, BES, Clean Bhutan, LG, DoI, BCCI
Strategy 16.2. Promote Research and Development on Sustainable Consumption and Production technologies and innovations.		
Action 16.2.1. Conduct research and development on post-production waste reduction technologies.	DECC	DoFPS, DHS, RSPN, BES, Clean Bhutan, LG, DoI, NSB, RUB, DAMC, WCD
Action 16.2.2. Carry out research on the adverse impacts of waste on biodiversity.	DECC	DHS, RSPN, BES, Clean Bhutan, LG, DoI, NSB, RUB, DAMC

NATIONAL TARGET 17: BY 2030, STRENGTHEN IMPLEMENTATION OF BIOSAFETY MEASURES		
Strategy 17.1. Enhance national biosafety frameworks and operational capacities.		
Action 17.1.1. Initiate ratification of the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress by the parliament	BFDA	DoL, DoA, DECC, BCCI, MFAET, OAG, Cabinet, Parliament
Action 17.1.2. Initiate revision of the Biosafety Act of Bhutan 2015.	BFDA	DoL, DoA, DECC, BCCI, MFAET, OAG, Cabinet, Parliament
NATIONAL TARGET 18. BY 2030, STRATEGIC INTERVENTIONS ON INCENTIVES ARE STREAMLINED TO SAFEGUARD BIODIVERSITY		
Strategy 18.1. Assess the impacts of incentives on biodiversity.		
Action 18.1.1. Conduct Comprehensive Impact Assessment of Incentives (encompassing review of policies, strategies and legislations).	NBC	DoFPS, MoAL, UNDP, MoIT, DoFPS, RSPN, DECC
Action 18.1.2. Identify and prioritize incentives having adverse impacts on biodiversity.	NBC	DoFPS, MoAL, UNDP, MoIT, DECC
Action 18.1.3. Assess the severity of adverse impacts of atleast one prioritized subsidies on biodiversity, and recommend the repurposing of prioritized incentives that negatively affect the biodiversity.	NBC	DoFPS, MoAL, UNDP, MoIT, DECC
Action 18.1.4. Develop a Monitoring and Evaluation Framework to track the impacts of subsidies over time on biodiversity.	NBC	DoFPS, MoAL, UNDP, MoIT, RSPN, DECC

NATIONAL TARGET 19: By 2025, resources to support implementation of NBSAP mobilized.		
Strategy 19.1. Enhance Resource Mobilization for effective implementation of the NBSAP.		
Action 19.1.1. Conduct resource mobilization consultation meetings to improve coordination among relevant stakeholders.	NBC	UNDP, MoF, DECC
Action 19.1.2. Carry out donor mapping and develop a potential donor database.	NBC	UNDP, MoF, DECC, DoFPS, UNDP
Strategy 19.2. Explore new and innovative financing mechanisms for biodiversity conservation.		
Action 19.2.1. Conduct an assessment of the Biodiversity and Environmental Finance gap.	DECC	DECC, MoF, DoFPS, MoAL, UNDP, RSPN, BES
Action 19.2.2. Identify new and innovative financing solutions for biodiversity conservation, such as the Bhutan carbon market, biodiversity credits, wildlife credits, green bonds, PES, and bioprospecting.	NBC	UNDP, MoF, DECC, DoW, DoFPS, BFL, BTFEC, RSPN
Action 19.2.3. Develop a resource mobilization plan for implementation of the NBSAP.	NBC	MoF, DECC, UNDP, WCD, MoAL
Action 19.2.4. Implement the resource mobilization plan.	NBC	DoFPS, MoF, DECC, DoA, DoL

NATIONAL TARGET 20: By 2030, strengthen capacity building, promote technology transfer and facililate technical and scientific cooperation		
Strategy 20.1. Enhance knowledge and understanding on biodiversity conservation.		
Action 20.1.1. Develop a Communication, Education and Public Awareness (CEPA) Action Plan for effective implementation of NBSAP (Refer Table 3).	NBC/DECC (Coordinate/facilitate)	RUB, MoESD, RSPN, Tarayana Foundation, BES, Youth Development Fund, Bhutan Media Foundation, Nazhoen Lamtoen, WCD
Action 20.1.2. Implement the Communication, Education and Public Awareness Action Plan.	NBC	RUB, MoESD, RSPN, Tarayana Foundation, BES, Youth Development Fund, Bhutan Media Foundation, Nazhoen Lamtoen
Strategy 20.2. Enhance the technical capacity of the relevant stakeholders for biodiversity conservation.		
Action 20.2.1. Conduct a Capacity Needs Assessment for effective implementation of the NBSAP.	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, WCD, UNDP
Action 20.2.2. Develop a Capacity Development Action Plan for effective implementation of the NBSAP (Refer Table 4).	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, WCD, UNDP

Action 20.2.3: Implement the Capacity Development Action Plan (Annexed).	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, UNDP
Strategy 20.3. Promote access to and transfer of technology.		
Action 20.3.1. Identify and adopt the best available technologies for conservation and sustainable use of biodiversity.	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, LG, RSPN, BES, Tarayana Foundation
Action 20.3.2. Establish a technology hub for exchange of information on the best available technologies.	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, RUB, RSPN, Tarayana Foundation, BES
Strategy 20.4. Facilitate technical and scientific cooperation for biodiversity conservation.		
Action 20.4.1. Institute a networking forum for scientific cooperation and partnership on biodiversity conservation.	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, RUB, RSPN, Tarayana Foundation, BES
Action 20.4.2. Initiate cooperation and partnership with institutions in the region and beyond for mutual collaboration (Refer Table 5).	NBC	DoFPS, DoA, DoL, NBC, DoECC, DoW, BFDA, LG, RUB, RSPN, Tarayana Foundation, BES

Annexure 3. Implenetation Plan for NBSAP

NBSAP Implementation Plan and Tentative Budget										
Target	Strategies	Actions	Budget (Nu Mn)	Budget (USD Mn)	Timeline				
					Y1	Y2	Y3	Y4	Y5
NATIONAL TARGET 1: BY 2030, PLAN AND MANAGE ALL AREAS TO REDUCE BIODIVERSITY LOSS	Strategy 1.1. Accelerate the implementation of comprehensive land-use zoning.	*Action 1.1.1. Update parameterization in the National Land Use Zoning (NLUZ) system to guide land use decisions prioritizing biodiversity conservation areas.*	8.00	0.095	Start		End		
		Action 1.1.2. Develop strategy/guidelines with key recommendations for the protection of prime traditional paddy fields to ensure wetland (Chhuzhing) and agrobiodiversity conservation.	1.00	0.012					
	Strategy 1.2. Strengthen knowledge of biodiversity in areas of high ecological importance.	*Action 1.2.1. Assess and update the status of biodiversity in biological corridors and/or one freshwater ecosystems.*	40.00	0.476					
		Action 1.2.2. Update and incorporate spatial biodiversity data into the NLUZ.	1.00	0.012					
	Strategy 1.3. Enhance management of areas of high ecological importance.	*Action 1.3.1. Update and/or develop management plans for PA and OECMs.*	10.00	0.119					
		Action 1.3.2. Implement management plans for PAs and OECMs.	30.00	0.357					
		Action 1.3.3. Assess the management effectiveness of PAs and other managed forest areas using Bhutan management effectiveness tracking tool plus (METT+).	2.00	0.024					
		Action 1.3.4. Institute river rangers and SMART patrolling program to protect freshwater biodiversity.	20.00	0.238					
		Action 1.3.5. Develop management plans for key agrobiodiversity sites.	40.00	0.476					
		Action 1.3.6. Conduct nationwide water resource inventory.	75.00	0.893					
		Action 1.3.7. Develop at least one river basin management plan.	25.00	0.298					
NATIONAL TAREGT 2: BY 2030, ENSURE AT LEAST 10% OF DEGRADED AREAS ARE BROUGHT UNDER EFFECTIVE RESTORATION	Strategy 2.1. Strengthen institutional coordination framework for restoration program.	*Action 2.1.1. Institute a multisectoral committee on restoration and rehabilitation to improve coordination.*	0.50	0.006					
	Strategy 2.2. Ensure degraded areas are brought under restoration for biodiversity conservation.	*Action 2.2.1. Develop a guideline for restoration and rehabilitation of degraded areas, including rangeland.*	1.00	0.012					
		Action 2.2.2. Conduct rangeland resource mapping.	5.00	0.060					
		Action 2.2.3. Identify and map degraded areas to establish baseline data.	30.00	0.357					
		Action 2.2.4. Implement restoration or rehabilitation activities in at least 10% of degraded areas.	5.00	0.060					

NATIONAL TARGET 3: BY 2030, STRENGTHEN INCLUSIVE PARTICIPATION IN BIODIVERSITY-RELATED DECISION-MAKING PROCESSES	**Strategy 3.1. Ensure inclusive stakeholder participation at all levels.**	*Action 3.1.1. Develop a guideline for inclusive participation in biodiversity-related decision-making, considering diverse genders and groups.*	5.00	0.060					
		Action 3.1.2. Develop a standard mechanism to monitor inclusive participation in biodiversity-related decision-making.	1.30	0.015					
NATIONAL TARGET 4: BY 2030, MAINTAIN THE POPULATION OF THREATENED SPECIES, CONSERVE GENETIC DIVERSITY AND MANAGE HUMAN WILDLIFE CONFLICT	**Strategy 4.1. Strengthen conservation of threatened species.**	*Action 4.1.1. Develop/Update baseline data for invertebrates, fish, herpetofauna, bryophytes, fungi and soil microbes.*	30.00	0.357					
		Action 4.1.2. Update the National Red List of species.	7.50	0.089					
		Action 4.1.3. Develop and implement species-specific conservation action plans for at least two threatened species.	5.00	0.060					
		Action 4.1.4. Explore and use emerging technologies for monitoring threatened species	40.00	0.476					
	Strategy 4.2. Strengthen conservation of genetic diversity of threatened species.	*Action 4.2.1: Expand and/or establish biorepositories and genebanks*	150.00	1.786					
		Action 4.2.2: Conduct an inventory of crop wild relatives for conservation.	4.00	0.048					
		Action 4.2.3: Develop and implement conservation action plans for native livestock species.	10.00	0.119					
		Action 4.2.4: Initiate germplasm conservation of key wildlife species	5.00	0.060					
		Action 4.2.5. Strengthen conservation breeding programs of the critically endangered White-bellied Heron.	10.00	0.119					
	Strategy 4.3. Strengthen Human Wildlife Conflict Management initiatives.	*Action 4.3.1: Update Human-Wildlife Conflict hotspot map.*	1.00	0.012					
		Action 4.3.2: Develop a holistic management plan to effectively manage human-wildlife conflict in strategic HWC hotspot areas.	40.00	0.476					
		Action 4.3.3: Implement innovative interventions for protection against wildlife.	20.00	0.238					
		Action 4.3.4: Institute Crop and livestock insurance scheme at national level.	1.00	0.012					
		Action 4.3.5: Strengthen one health program linking biodiversity conservation, and human and animal health.	10.00	0.119					

NATIONAL TARGET 5: BY 2030, ENSURE SAFE AND LEGAL HARVESTING OF WILD SPECIES FOR SOCIAL, ECONOMIC, AND ENVIRONMENTAL BENEFITS IN A SUSTAINABLE MANNER	**Strategy 5.1. Strengthen sustainable utilization of economically important wild species.**	*Action 5.1.1. Conduct resource assessment of economically important wild species including those used in Bhutanese Tradition Medicine (Sowa Rigpa).*	5.00	0.060					
		Action 5.1.2: Carry out domestication trial for at least one identified species.	3.00	0.036					
		Action 5.1.3. Review and recommend amendment of the Forest Nature Conservation Rules and Regulations 2023 to incorporate emerging trade of wild species.	1.00	0.012					
		Action 5.1.4. Update guidelines for sustainable utilization of economically important wild species integrating biodiversity and health.	5.00	0.060					
		Action 5.1.5. Update or develop community-based management plans for sustainable management and harvesting of wild species.	25.00	0.298					
		Action 5.1.6. Enforce effective compliance monitoring of illegal collection of wild species.	1.50	0.018					
NATIONAL TARGET 6: BY 2030, MANAGE INVASIVE ALIEN SPECIES TO MINIMIZE THEIR IMPACTS ON BIODIVERSITY	**Strategy 6.1. Strengthen coordination mechanisms for the management of IAS.**	*Action 6.1.1: Review existing legislation to streamline roles and responsibilities for coordinated management of IAS.*	0.50	0.006					
		Action 6.1.2: Develop guidelines/SOP for effective management of the IAS pathways.	1.50	0.018					
		Action 6.1.3: Implement guidelines/SOP for management of IAS.	5.00	0.060					
	Strategy 6.2. Strengthen knowledge of IAS and its impacts.	*Action 6.2.1: Conduct research on the status of IAS pathways, distribution, and impact.*	5.0	0.060					
		Action 6.2.2: Update and maintain the IAS database.	2.0	0.024					
NATIONAL TARGET 7: BY 2030, ENSURE REDUCTION IN POLLUTION TO MINIMIZE THREATS TO BIODIVERSITY	**Strategy 7.1. Enhance measures to mitigate pollution that have an adverse impact on biodiversity.**	*Action 7.1.1. Identify major pollutants that have adverse impacts on biodiversity.*	0.50	0.006					
		Action 7.1.2. Identify and adopt state-of-the-art technologies to abate pollution.	3.0	0.036					
		Action 7.1.3. Update the existing Environmental Standards 2020 and IEE guidelines.	1.00	0.012					
	Strategy 7.2. Strengthen compliance monitoring of development activities that have adverse impacts on biodiversity.	*Action 7.2.1. Conduct annual compliance monitoring of developmental activities, among others, taking into consideration the adverse impact on biodiversity.*	5.00	0.060					
		Action 7.2.2. Conduct gap assessment of the existing waste management facilities to ensure effective monitoring of environmental standards.	1.50	0.018					

NATIONAL TARGET 8: BY 2030, MINIMIZE THE ADVERSE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE	**Strategy 8.1. Enhance knowledge and understanding of the adverse impact of climate change on biodiversity.**	*Action 8.1.1: Conduct research on the adverse impacts of climate change on Mountain biodiversity and develop policy briefs for informed decision-making.*	5.00	0.060					
		Action 8.1.2: Implement recommendations based on the outcomes of the research.	2.00	0.024					
		Action 8.1.3: Organize at least one symposium/seminar/conference on mountain biodiversity, focusing on biodiversity and health, at the international level.	2.00	0.024					
	Strategy 8.2. Increase carbon sequestration and reduce emissions to uphold carbon neutrality.	*Action 8.2.1. Explore and adopt renewable energy sources to reduce carbon emissions.*	30.0	0.357					
		Action 8.2.2. Upscale afforestation and reforestation programs.	10.0	0.119					
		Action 8.2.3. Strengthen forest fire prevention and management measures.	10.0	0.119					
		Action 8.2.4. Develop guidelines for the scientific management of landfills, to regulate GHG emissions.	1.0	0.012					
		Action 8.2.5. Foster regional and international collaborations for climate financing, carbon trading and REDD+ initiatives.	2.00	0.024					
NATIONAL TARGE 9: BY 2030, ENSURE THAT INFORMATION AND KNOWLEDGE RELATED TO BIODIVERSITY ARE AVAILABLE AND ACCESSIBLE	**Strategy 9.1. Strengthen biodiversity-related information and knowledge base.**	*Action 9.1.1. Identify data gaps in biodiversity-related information and knowledge.*	1.00	0.012					
		Action 9.1.2. Conduct targeted biodiversity assessments to address data gaps.	10.00	0.119					
		Action 9.1.3. Develop SOPs for data collation, validation, and publication.	2.00	0.024					
		Action 9.1.4. Update the Bhutan Biodiversity Statistics.	1.50	0.018					
	Strategy 9.2. Enhance availability and accessibility of biodiversity-related information and knowledge.	*Action 9.2.1. Establish a national GBIF node to facilitate biodiversity data sharing and integration.*	1.00	0.012					
		Action 9.2.2. Upgrade the Bhutan Biodiversity Portal as a centralized biodiversity data repository.	5.00	0.060					
		Action 9.2.3. Make Bhutan Biodiversity Portal website/app user-friendly and accessible across multiple platforms.	2.00	0.024					

NATIONAL TARGET 10: BY 2030, ENSURE THAT AREAS UNDER AGRICULTURE, LIVESTOCK, FISHERIES, AND FORESTRY ARE MANAGED SUSTAINABLY FOR SECURITY AND LIVELIHOOD	**Strategy 10.1. Strengthen sustainable agriculture and livestock practices.**	*Action 10.1.1. Assess and promote new and improved crops and forage varieties, livestock and fish breeds.*	4.00	0.048						
		Action 10.1.2. Assess and promote improved livestock breeding and management practices including herd-health and farm biosecurity.	7.00	0.083						
		Action 10.1.3 Upscale Sustainable Land Management (SLM) practices.	10.00	0.119						
		Action 10.1.4. Develop Good Agricultural Practices (GAP) guidelines for prioritized agricultural commodities.	2.00	0.024						
		Action 10.1.5. Upscale fruit production to enhance livelihood.	8.00	0.095						
		Action 10.1.6. Conduct applied research to promote sustainable agriculture and livestock practices.	3.00	0.036						
	Strategy 10.2. Promote agricultural innovation and technology.	*Action 10.2.1. Pilot hi-tech agriculture farms and precision livestock farming.*	8.00	0.095						
		Action 10.2.2. Develop improved pasture and agro-silvopasture systems to enhance fodder availability.	5.00	0.060						
		Action 10.2.3 Identify and adopt innovative technologies and approaches to improve soil fertility.	5.00	0.060						
		Action 10.2.4. Improve surveillance systems for monitoring pests and transboundary animal diseases.	9.00	0.107						
		Action 10.2.5. Upscale water use efficiency technologies and climate-proofing irrigation systems to build climate resilience.	20.00	0.238						
		Action 10.2.6. Adopt climate-smart agriculture and livestock farming practices and innovations.	10.00	0.119						
	Strategy 10.3. Promote measures to mitigate crop and livestock damage against extreme climate conditions.	*Action 10.3.1. Strengthen agro-meteorological services through the Agromet Decision Support System (ADSS).*	2.00	0.024						
		Action 10.3.2: Pilot index-based crop and livestock insurance scheme to enhance adaptation to climate change impacts.	10.00	0.119						
	Strategy 10.4. Strengthen sustainable management of forest resources.	*Action 10.4.1. Bring additional unmanaged State Reserved Forest land under sustainable forest management regimes.*	10.00	0.119						
		Action 10.4.2: Develop and implement management plans for Community Forests (CFs), Local Forests (LFs), and Forest Management Units (FMUs).	10.00	0.119						
	Strategy 10.5. Strengthen sustainable management of fishery resources.	*Action 10.5.1. Upscale recreational fishery programs.*	10.00	10.00						
		Action 10.5.2. Revive existing and develop new community-based fisheries management programs.	2.00	2.00						

NATIONAL TARGET 11: BY 2030, MAINTAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE	**Strategy 11.1. Promote nature-based solutions and ecosystem-based approaches.**	*Action 11.1.1. Explore and adopt NbS in climate adaptation and mitigation, disaster risk reduction, including forest fires, water and food security, habitat restoration, and socio-economic benefits and livelihood.*	10.00	0.119					
		Action 11.1.2. Implement at least two nature-based solutions related to biodiversity conservation and sustainable livelihood.	60.00	0.714					
		Action 11.1.3. Explore and initiate isolation and identification of beneficial soil microbes and insects for biofertilizer production and bioprospecting.	5.00	0.060					
	Strategy 11.2. Mainstream economic value of ecosystem services into the national accounting system.	*Action 11.2.1. Implement National Implementation Plan for the System of Environmental-Economic Accounting in Bhutan (2024-2029).*	5.00	0.060					
NATIONAL TARGET 12: BY 2030, ENHANCE AND/OR PLAN GREEN AND BLUE SPACES IN URBAN AREAS FOR SOCIAL WELL-BEING AND BIODIVERSITY CONSERVATION	**Strategy 12.1. Strengthen biodiversity-inclusive urban planning and development.**	*Action 12.1.1. Develop frameworks/guidelines for inclusive planning, management, and monitoring of green and blue spaces.*	1.00	0.012					
		Action 12.1.2. Conduct inventory of existing green and blue spaces focusing on urban areas.	2.00	0.024					
		Action 12.1.3. Establish and/or maintain green and blue spaces in Thromdes, taking into consideration people with special needs.	10.00	0.119					
		Action 12.1.4. Develop City Biodiversity Index in at least two Thromdes.	2.00	0.024					
		Action 12.1.5. Conduct research to evaluate the health and biodiversity value of green and blue spaces.	2.00	0.024					
		Action 12.1.6. Revise the Building Codes of Bhutan to incorporate the concept of green and blue spaces in urban planning.	2.00	0.024					
		Action 13.1.1. Develop Communication, Education and Public Awareness Strategies on Access and Benefit Sharing.	1.50	0.018					
		Action 13.1.2. Enforce the Biodiversity Act of Bhutan 2022 and Biodiversity Rules and Regulations 2023 to prevent misappropriation.	10.00	0.119					

NATIONAL TARGET 13: BY 2030, INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE ASSOCIATED WITH BIOLOGICAL RESOURCES	**Strategy 13.1. Strengthen the coordination mechanism for implementation of the Access and Benefit Sharing regime to ensure fair and equitable sharing of benefits and prevent misappropriation.**	*Action 13.1.3. Participate in regional and international forums for Access and Benefit Sharing to foster institutional linkages.*	10.00	0.119					
		Action 13.1.4. Upscale Bioprospecting and Access and Benefit Sharing initiatives and explore branding and certification of bioprospecting-based products.	10.00	0.119					
		Action 13.1.5. Establish a Bhutan Access and Benefit Sharing Clearing House Mechanism.	1.00	0.012					
		Action 13.1.6: Develop a strategy to make the Bhutan Access and Benefit Sharing fund innovative and sustainable.	2.00	0.024					
	Strategy 13.2. Strengthen repository of Traditional Knowledge associated with biological resources and customary practices relevant to biodiversity conservation and sustainable use.	*Action 13.2.1. Document traditional knowledge associated with biological resources and customary practices related to traditional medicine.*	5.00	0.060					
		Action 13.2.2. Develop a strategy for the protection and appropriate utilisation of traditional knowledge associated with biological resources.	2.00	0.024					
NATIONAL TARGET 14: BY 2030, ENHANCE MAINSTREAMING AND INTEGRATION OF NBSAP INTO NATIONAL, SECTORAL, AND LOCAL PLANS	**Strategy 14.1. Mainstream NBSAP into policies, strategies, plans and programs.**	*Action 14.1.1. Endorse NBSAP as the national guiding document.*	1.00	0.012					
		Action 14.1.2. Establish a multi-sectoral committee or entrust the responsibility to one of the relevant existing committees to oversee the implementation of the NBSAP.	1.00	0.012					
		Action 14.1.3. Conduct sector-specific workshops to identify entry points for NBSAP targets and incorporate relevant actions to the sector plans.	2.50	0.030					
		Action 14.1.4. Align NDC 3.0 with the fifth NBSAP to integrate biodiversity considerations into climate commitments.	1.00	0.012					
NATIONAL TARGET 15: BY 2030, ENSURE GENDER EQUALITY AND GENDER RESPONSIVE APPROACH IN BIODIVERSITY ACTIONS	**Strategy 15.1. Promote gender-responsive approaches in biodiversity conservation programs.**	*Action 15.1.1. Conduct gender analysis in biodiversity conservation programs to assess and address gender-specific gaps and opportunities.*	1.30	0.015					
		Action 15.1.2. Develop gender and biodiversity action plans.	1.00	0.012					
		Action 15.1.3. Implement gender and biodiversity action plans.	3.00	0.036					
		Action 15.1.4 Assess the implementation of gender and biodiversity actions.	1.00	0.012					

NATIONAL TARGET 16: BY 2030, PROMOTE SUSTAINABLE CONSUMPTION AND PRODUCTION TO REDUCE WASTE	**Strategy 16.1. Promote Sustainable Consumption and Production to minimize waste.**	*Action 16.1.1. Institute compliance monitoring mechanism to minimize waste at source.*	2.00	0.024					
		Action 16.1.2. Explore and implement Extended Producer Responsibility (EPR) to reduce waste.	2.0	0.024					
		Action 16.1.3. Explore and implement Public-Private Partnerships (PPP) in waste reduction and management.	3.0	0.036					
	Strategy 16.2. Promote Research and Development on Sustainable Consumption and Production technologies and innovations.	*Action 16.2.1. Conduct research and development on post-production waste reduction technologies.*	5.0	0.060					
		Action 16.2.2. Carry out research on the adverse impacts of waste on biodiversity.	3.0	0.036					
NATIONAL TARGET 17: BY 2030, STRENGTHEN IMPLEMENTATION OF BIOSAFETY MEASURES	**Strategy 17.1. Enhance national biosafety frameworks and operational capacities.**	*Action 17.1.1. Initiate ratification of the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress by the Parliament.*	1.50	0.018					
		Action 17.1.2. Initiate revision of the Biosafety Act of Bhutan 2015.	4.50	0.054					
NATIONAL TARGET 18: BY 2030, STRATEGIC INTERVENTIONS ON INCENTIVES ARE STREAMLINED TO SAFEGUARD BIODIVERSITY	**Strategy 18.1. Assess the impacts of incentives on biodiversity.**	*Strategy 18.1. Assess the impacts of incentives on biodiversity.*	1.50	0.018					
		Action 18.1.2 Identify and prioritize incentives having adverse impacts on biodiversity.	1.00	0.012					
		Action 18.1.3. Assess the severity of adverse impacts of at least one prioritized subsidy on biodiversity and recommend the repurposing of prioritised incentives that negatively affect biodiversity.	1.00	0.012					
		Action 18.1.4. Develop a Monitoring and Evaluation Framework to track the impacts of subsidies over time on biodiversity.	1.00	0.012					

NATIONAL TARGET 19: BY 2025, RESOURCES TO SUPPORT IMPLEMENTATION OF NBSAP ARE MOBILIZED	**Strategy 19.1. Enhance Resource Mobilization for effective implementation of the NBSAP.**	*Action 19.1.1. Conduct a resource mobilization consultation meeting to improve coordination among relevant stakeholders.*	1.50	0.018					
		Action 19.1.2. Carry out donor mapping and develop a potential donor database.	1.00	0.012					
	Strategy 19.2. Explore new and innovative financing mechanisms for biodiversity conservation.	*Action 19.2.1. Conduct an assessment of the Biodiversity and Environmental Finance gap.*	2.00	0.024					
		Action 19.2.2. Identify new and innovative financing solutions for biodiversity conservation, such as the Bhutan carbon market, biodiversity credits, wildlife credits, green bonds, PES, and bioprospecting.	3.0	0.036					
		Action 19.2.3. Develop a resource mobilization plan for implementation of the NBSAP.	5.0	0.060					
		Action 19.2.4. Implement the resource mobilization plan.	0.00	0					
NATIONAL TARGET 20: BY 2030, STRENGTHEN CAPACITY BUILDING, PROMOTE TECHNOLOGY TRANSFER, AND FACILITATE TECHNICAL AND SCIENTIFIC COOPERATION	**Strategy 20.1. Enhance knowledge and understanding of biodiversity conservation.**	*Action 20.1.1. Develop a Communication, Education and Public Awareness Action Plan for effective implementation of NBSAP.*	1.00	0.012					
		Action 20.1.2. Implement the Communication, Education and Public Awareness Action Plan.	2.00	0.024					
	Strategy 20.2. Enhance the technical capacity of the relevant stakeholders for biodiversity conservation.	*Action 20.2.1. Conduct Capacity Needs Assessment for effective implementation of the NBSAP.*	2.00	0.024					
		Action 20.2.2. Develop a Capacity Development Action Plan for effective implementation of the NBSAP.	1.00	0.012					
		Action 20.2.3. Implement the Capacity Development Action Plan.	50.00	0.595					
	Strategy 20.3. Promote access to and transfer of technology.	*Action 20.3.1. Identify and adopt the best available technologies for the conservation and sustainable use of biodiversity.*	5.00	0.060					
		Action 20.3.2. Establish a technology hub for the exchange of information on the best available technologies.	10.0	0.119					
	Strategy 20.4. Facilitate technical and scientific cooperation for biodiversity conservation.	*Action 20.4.1. Institute a networking forum for scientific cooperation and partnership on biodiversity conservation.*	10.0	0.119					
		Action 20.4.2. Initiate cooperation and partnership with institutions in the region and beyond for mutual collaboration.	1.0	0.012					

Annexure 4. NBSAP Monioring and Evaluation Framework

NBSAP Montoring and Evaluation Framework							
Target	**Indicator**	**Indicator description**	**Unit**	**Baseline (2024)**	**Target (2030)**	**Means of Verification**	**Reporting Frequency**
TARGET 1: BY 2030, PLAN AND MANAGE ALL AREAS TO REDUCE BIODIVERSITY LOSS	Timeline for updating parameterization in the National Land Use Zoning system.	This indicator measures the timeline by which prioritized biodiversity areas updated in the NLUZ system.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for developing a strategy or guidelines with key recommendations to protect prime traditional paddy fields for wetland and agrobiodiversity conservation.	This indicator measures the timeline by which strategy/guidelines for protection of traditional paddy fields is developed.	Date	-	December 2030	NBSAP annual progress report	Annually
	Percentage increase in management effectivenesss score for Protected Areas (PAs).	This indicator measures the percentage increase in the management effectiveness score of the Protected Areas (PAs).	%	-	Increasing trend	NBSAP annual progress report	Annually
	Timeline for instituting a river rangers and SMART patrolling program to safeguard freshwater biodiversity.	This indicator measures the timeline by which the river rangers and SMART patrolling programs for safeguarding freshwater biodiversity are rolled out.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for updating, developing, and implementing Management Plans for PAs, OECMs, and agrobiodiversity conservation sites.	This indicator measures the timeline by management Plans for PAs, OECMs, and agrobiodiversity conservation sites are updated, developed and implemented.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for conducting a national water resource inventory.	This indicator measures the timeline by which the national water resources inventory is conducted.	Date	-	December 2030	NBSAP annual progress report	Annually
	Number of River Basin Management Plans developed.	This indicator measures the number of river basin management plan developed	Number	1	1	NBSAP annual progress report	Annually
TARGET 2: BY 2030, ENSURE AT LEAST 10% OF DEGRADED AREAS ARE BROUGHT UNDER EFFECTIVE RESTORATION	Timeline for instituting a multi-sectoral committee on ecosystem restoration and rehabilitation.	This indicator measures that timeline by which a multi-sectoral committee for restoration and rehabilitation is insituted.	Date	-	December 2026	NBSAP annual progress report	Annually
	Time for developing national guidelines on ecosystem restoration and rehabilitation.	This indicator measures the timeline by which a guideline for restoration and rehabilitation is developed.	Date	-	December 2026	NBSAP annual progress report	Annually
	Timeline for completing national rangeland resource mapping.	This indicator measures the timeline by which rangeland mapping is completed.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for establishing baseline data on the extent and condition of degraded ecosystems.	This indicator measures the timeline by which baseline data is established.	Date	-	December 2030	NBSAP annual progress report	Annually
	Increase in total acreage of degraded areas under effective restoration.	This indicator measures the hectre of degraded areas brought under restoration	Hectare	20,695	21,695	NBSAP annual progress report	Annually

TARGET 3: BY 2030, STRENGTHEN INCLUSIVE PARTICIPATION IN BIODIVERSITY RELATED DECISION-MAKING PROCESSES	Timeline for developing national guidelines to ensure inclusive participation in biodiversity related decision-making.	This indicator measures the timeline by which a guideline for inclusive participation in biodiversity-related decision-making is developed.	Date	-	December 2026	NBSAP annual progress report	Annually
	Timeline for establishing a standardized mechanism to monitor inclusive participation in biodiversity planning and governance.	This indicator measures the timeline by which a standardized mechanism to monitor inclusive participation in biodiversity planning and governance is developed.	Date	-	December 2027	NBSAP annual progress report	Annually
TARGET 4: BY 2030, MAINTAIN THE POPULATION OF THREATENED SPECIES, CONSERVE GENETIC DIVERSITY AND MANAGE HUMAN-WILDLIFE CONFLICT	Number of studies conducted to generate baseline data on lesser-known and negelected biodiversity.	This indicator measures the number of inventories/studies conducted to generate data on lesser-known and neglected biodiversity.	Number	-	4	NBSAP annual progress report	Annually
	Number of species in Bhutan assessed and published in the IUCN Red List.	This indicator measures the number of species in Bhutan assessed for the IUCN Red list index.	Number	1929	2030	The IUCN Red List of Threatened Species	Annually
	Number of Species Conservation Action Plans developed and implemented.	This indicator measures the number of species conservation action plans developed and implemented for the conservation of key biodiversity, including agrobiodiversity	Number	7	10	NBSAP annual progress report	Annually
	Timeline for establishing or expanding biorepositories and genebanks for biodiversity conservations.	This indicator measures the timeline by which biorepositories and genebanks are expanded and established.	Date	-	December 2030	NBSAP annual progress report	Annually
	Number of germplasm accessions conserved in national biorepositories for research, conservation, and development.	This indicator measures the number of germplasm accessions conserved in national biorepositories for research, conservation, and development.	No. of species	77562	94062	NBSAP annual progress report	Annually
	Timeline for completing an inventory of crop wild relatives for conservation planning.	This indicator measures the timeline by which inventories of crop wild relatives are completed.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for developing and implementing conservation action plans for native livestock species.	This indicator measures the timeline by which conservation action plans for native livestock species are developed and implemented.	Date	-	December 2030	NBSAP annual progress report	Annually
	Timeline for initiating germplasm conservation efforts for key wildlife species.	This indicator measures the timeline by which germplasm conservation for key wildlife species is initiated.	Date	-	December 2030	NBSAP annual progress report	Annually
	Trends in the success rate of conservation breeding programs for the critically endangered White-bellied Heron.	This indicator measures the increasing trends in the success of the conservation breeding programs of the critically endangered White-bellied Heron.	Percentage	-	Increasing trends	NBSAP annual progress report	Annually

	Timeline for developing a Human-Wildlife Conflict hotspot map.	This indicator measures the timeline by which a Human-Wildlife Conflict hotspot map is developed.	Date	-	December 2030	NBSAP annual progress report	Annually
	Number of innovative HWC mitigation measures implemented.	This indicator measures the number of innovative HWC mitigation measures put in place.	Number	-	3	NBSAP annual progress report	Annually
	Timeline for establishing national crop and livestock insurance schemes.	This indicator measures the timeline by which the national crop and livestock insurance is established	Date	-	July 2025	NBSAP annual progress report	Annually
TARGET 5: BY 2030, ENSURE SAFE AND LEGAL HARVESTING OF WILD SPECIES FOR SOCIAL, ECONOMIC, AND ENVIRONMENTAL BENEFITS IN A SUSTAINABLE MANNER	Timeline for conducting resource assessment for economically important species.	This indicator measures the timeline by which assessments for economically important species are carried out.	Date	-	December 2030	NBSAP annual progress report	Annually
	Number of guidelines or management plans developed or updated for sustainable management of wild species.	This measures the number of guidelines/management plans developed including updation for sustainable management of wild species	Number	-	30	NBSAP annual progress report	Annually
	Timeline for submitting recommendations to review the FNCRR 2023 to incorporate provisions for emerging trade in wild species.	This indicator measures the timeline by which the recommendation is made to review the Forest and Nature Conservation Rules and Regulations 2023 for the incorporation of trade in wild species.	Date	-	December 2027	NBSAP annual progress report	Annually
	Number of innovative technologies adopted for monitoring wild species.	This indicator measures the number of innovative tools and technologies adopted for monitoring wild speices.	Number	2	4	NBSAP annual progress report	Annually
TARGET 6: BY 2030, MANAGE INVASIVE ALIEN SPECIES TO MINIMIZE THEIR IMPACTS ON BIODIVERSITY	Timeline for completing revisions of existing legislation to clarify and streamline roles and responsibilities related to Invasive Alien Species (IAS) management.	This indicator measures the timeline by which revisions of existing legislation to streamline the roles and responsibilities related to IAS is completed.	Date	-	December 2029	NBSAP annual progress report	Annually
	Number of guidelines/SOPs for the management of key IAS developed.	This indicator measures the number of guidelines/SOPs for the management of key IAS developed.	Number	0	1	NBSAP annual progress report	Annually
	Number of research and studies conducted on the status, distribution, and impacts of IAS in Bhutan.	This indicator measures the number of research conducted on the status of IAS.	Number	-	1	NBSAP annual progress report	Annually
	Timeline for updating and maintaining a centralized IAS database.	This indicator measures the timeline by which a centralized IAS database is updated and maintained.	Date	-	December 2028	NBSAP annual progress report	Annually

TARGET 7: BY 2030, ENSURE REDUCTION IN POLLUTION TO MINIMIZE THREATS TO BIODIVERSITY	Timeline for establishing clean technology incentive schemes to support pollution control measures.	This indicator measures the timeline by which the initiatives are undertaken to provide technology incentives for pollution control	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for updating existing Environmental Standards and Initial Environmental Examination (IEE) guidelines.	This indicator measures the timeline by which the Environmental Standard and the IEE guidelines are updated.	Date	-	December 2028	NBSAP Annual Report	Annually
	Timeline for conducting a gap assessment of existing waste management facilities to ensure monitoring of environmental standards.	This indicator measure the timeline by which a gap assessment of existing waste management facilities is carried out.	Number	5	December 2028	NBSAP Annual Report	Annually
TARGET 8: BY 2030, MINIMIZE THE ADVERSE IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND BUILD RESILIENCE	Number of research studies conducted on the impacts of climate change on mountain biodiversity.	This indicator measures the number of research conducted to document the impacts of climate change on mountain biodiversity.	Number	-	5	NBSAP Annual Report	Annually
	Trends in forest fire incidence.	This indicator measures the number of forest fire incidents.	Number	-	Decrease	NBSAP Annual Report	Annually
	Number of renewable energy sources adopted for climate change mitigation and adaptation.	This indicator measures the number of renewable energy sources adopted	Number	-	2	NBSAP Annual Report	Annually
	Number of Standard Operating Procedures (SOPs) developed for landfill management to regulate greenhouse gas (GHG) emissions.	This indicator measures the number of SOPs developed for landfill management to regulate GHG emissions.	Number	-	1	NBSAP Annual Report	Annually
	Trends in the amount of climate finance accessed for biodiversity and ecosystem-based climate solutions.	This indicator measures the trends in the amount of climate finance accessed.	Trend	-	Increase	NBSAP Annual Report	Annually
TARGET 9: BY 2030, ENSURE THAT INFORMATION AND KNOWLEDGE RELATED TO BIODIVERSITY ARE AVAILABLE AND ACCESSIBLE	Number of targeted biodiversity assessments conducted to address critical knowledge gaps.	This measures the number of targeted assessments conducted to address critical biodiversity gaps.	Number	-	25	NBSAP Annual Report	Annually
	Timeline by which Standard Operating Procedures (SOPs) developed for biodiversity data collation, validation, and publication.	This indicator measures the timeline by which the SOPs for data collation, validation, and publications are developed.	Date	-	December 2028	NBSAP Annual Report	Annually
	Timeline for updating the Bhutan Biodiversity Statistics report.	This indicator measure the timeline by which the Bhutan Biodiversity Statistics is updated.	Date	-	Dec 2028	NBSAP Annual Report	Annually
	Number of registered contributors on the Bhutan Biodiversity Portal (BBP).	This indicator measures the number of users contributing to the Bhutan Biodiversity Portal.	Number	2,400	2900	NBSAP Annual Report/BBP	Annually
	Timeline for establishing a national GBIF node to facilitate biodiversity data sharing and integration.	This indicator measures the timeline by which a national GBIF node to facilitate biodiversity data sharing and integration is established.	Date	-	December 2029	NBSAP Annual Report	Annually
	Timeline for upgrading the BBP to enhance usability, accessibility, and data interoperability.	This measures the timeline by which BBP is upgraded.	Number	-	December 2028	NBSAP Annual Report	Annually

TARGET 10: BY 2030, ENSURE THAT AREAS UNDER AGRICULTURE, LIVESTOCK, FISHERIES, AND FORESTRY ARE MANAGED SUSTAINABLY FOR FOOD SECURITY AND LIVELIHOOD	Trends in adoption of new and improved crops and forage varieties, livestock, and fish breeds.	This indicator measures the trends in the adoption of new and improved crops and forage varieties, livestock, and fish breeds.	Trend	-	Increase	NBSAP Annual Report	Annually
	Areas brought under SLM	This measures the acreage of land brought under sustainable land management	Acres	11620	15220	Sectoral Annual Report	Annually
	Number of climate-smart agriculture and livestock research conducted and technologies adopted/released.	This indicator measures the number of climate-smart agriculture and livestock researched carried out and also the number of technologies adopted	Number	119	169	Sectoral Annual Report	Annually
	Timeline for developing Good Agriculture Practice (GAP) guidelines for prioritized agricultureal commodities.	This indicator measures the Timeline by which GAP guidelines for prioritized agricultural commodities are developed.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for conducting research on sustainable agriculture and livestock production systems.	This indicator measures the timeline by which research on sustainable agriculture and livestock practices are carried out.	Date	-	December 2030	NBSAP Annual Report	Annually
	Number of Hi-tech agriculture farms piloted	This indicator measures the number of hi-tech agriculture farms piloted	Number	0	2	Sectoral Annual Report	Annually
	Timeline for developing improved pasture and agro-silvopasture systems to enhance year-round fodder availability.	This indicator measures the timeline by which improved pasture and agro-silvopasture systems to enhance fodder availability are developed.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for identifying and adopting innovative technologies and approaches to improve soil fertility.	This indicator measures the timeline by which innovative technologies and approaches are identified and adopted to improve soil fertility.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for strengthening pest and disease surveillance and response systems.	This indicator measures the timeline by which crop and livestock disease survellience systems is strengthend.	Date		December 2030	NBSAP Annual Report	Annually
	Number of irrigation schemes established and operationalized.	This indicator measures the acreage of land provided with assured irrigation systems	Number	1200	1226	NBSAP Annual Report	Annually
	Timeline for strengthening agro-meteorological services through the Agriculture Decision Support System (ADSS).	This indicator measures the timeline by which agro-metereological services through the ADSS are strengthened.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for piloting index-based crop and livestock insurance scheme.	This indicator measures the timeline by which the index-based crop and livestock insurance scheme is piloted.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for bringing additional State Reserved Forest (SRF) under sustainable forest management.	This indicator measures the timeline by which additional SRF land is brought under sustainable forest management	Date	-	December 2030	NBSAP Annual Report	Annually
	Number of sustainable forest management plans developed and implemented.	This indicator measures the number of sustainable forest management plans developed and key interventions implemented	Number	21	30	NBSAP Annual Report	Annually
	Number of community-based enterprise (forest) established and functioning.	This measures the number of community-based forest enterprises established	Number	615 (WBI)	700	NBSAP Annual Report	Annually
	Number of community-based fishery management programs revived/established	This indicator measures the number of community-based fishery management programs revived/established	Number	5	7	NBSAP Annual Report	Annually

TARGET 11: BY 2030, MAINTAIN AND ENHANCE NATURE'S CONTRIBUTION TO PEOPLE	Timeline for implementing Nature-Based Solutions (NBS) and ecosystem based approaches for climate resilience and biodiversity conservation.	This indicator measures the timeline by which NbS and ecosystem-based approaches implemented	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for identifying beneficial soil microbes and insects for bioprospecting and sustainable utilization.	This indicator measures the timeline by which beneifical soil microbes and insects are identified for bioprospecting	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for adopting the National Implementation Plan for the System of Environmental-Economic Accounting (SEEA).	This indicator measures the timeline by which the National Implementation Plan for the System of Environmental-Economic Accounting is adopted.	Date	-	December 2030	NBSAP Annual Report	Annually
	Number of NbS related to biodiversity conservation and sustainable livelihood implemented.	This indicator measures the number of NbS interventions implemented that contribute to both biodiversity conservation and sustainable livelihoods.	Number	-	Increase	NBSAP Annual Report	Annually
TARGET 12: BY 2030, ENHANCE AND/OR PLAN GREEN AND BLUE SPACES IN URBAN AREAS FOR SOCIAL WELL-BEING AND BIODIVERSITY CONSERVATION	Number of guidelines reviewed or developed to promote the integration of green and blue spaces in urban planning.	This indicator measures the number of guidelines reviewed/revised or developed for promotion of green and blue spaces	Number	0	1	NBSAP Annual Report	Annually
	Timeline for completing a national inventory of existing green and glue spaces in urban areas.	This indicator measures the timeline by which the inventory of existing green and blue spaces in urban areas is completed.	Date	-	December 2030	NBSAP Annual Report	Annually
	Number of new green and blue spaces developed with integrated biodiversity conservation features.	This indicator measure the number of new green and blue spaces developed with biodiversity conservation integrated	Number	0	4	NBSAP Annual Report	Annually
	Number of cities with city/Thromdes biodiversity index initiated or developed.	This indicator measures the number of cites/Thromdes with biodiversity index initiated.	Date	0	3	NBSAP Annual Report	Annually
TAREGT 13; BY 2030, INCREASE THE SHARING OF BENEFITS FROM GENETIC RESOURCES, DIGITAL SEQUENCE INFORMATION AND TRADITIONAL KNOWLEDGE ASSOCIATED WITH BIOLOGICAL RESOURCES	Timeline for developing a Communication, Education, and Public Awareness (CEPA) strategy on ABS.	This indicator measures the timeline by which the CEPA strategy is developed.	Date	-	December 2027	NBSAP Annual Report	Annually
	Number of institutional facilities and capacities established for biodiscoveries and biopropsecting.	This indicator measures the number of institutional facilities and capacity for biodiscoveries and bioprospecting established and carried out.	Numbers	0	1	NBSAP Annual Report	Annually
	Number of initiatives, agreements and nature-based products implemented under the Access and Benefit Sharing (ABS) framework.	This indicator measures the number of initiatives, agreements and nature-based products implement under the ABS framework	Numbers	14	16	NBSAP Annual Report	Annually
	Timeline for developing a national strategy document on Traditional Knowledge (TK) associated with biological resources.	This measures the timeline by which a strategy document on TK associated with biological resources is developed	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for establishing the national ABS Clearing House Mechanism.	This indicator measures the timeline by which the ABS Clearing House Mechanism will be estalished.	Date	-	December 2029	NBSAP Annual Report	Annually
	Timeline for developing a national strategy for the operationalization of the ABS Fund.	This indicator measures the timeline by which ABS Fund Strategy is developed.	Date	-	December 2027	NBSAP Annual Report	Annually

TARGET 14: BY 2030, ENHANCE MAINSTREAMING AND INTEGRATION OF NBSAP INTO NATIONAL, SECTORAL, AND LOCAL PLANS	Timeline for the revision and official endorsement of the National Biodiversity Strategy and Action Plan (NBSAP) document.	The indicator measures the timeline by which NBSAP is revised and endorsed.	Date	-	December 2025	NBSAP Annual Report	Annually
	Timeline for establishing a multi-secotral committee to oversee NBSAP implementation and coordination.	This indicator measures the timeline by which a functional multi-sectoral committee to oversee NBSAP implementation is formed.	Date	-	December 2026	NBSAP Annual Report	Annually
	Proportion of NBSAP strategies and actions mainstreamed into national, sectoral, and local development plans.	This indicator tracks how often the NBSAP targets, strategies, and actions are incorporated into national, sectoral, and local development plans.	Frequency	-	Annually	NBSAP Annual Report	Annually
TARGET 15: BY 2030, ENSURE GENDER EQUALITY AND GENDER-RESPONSIVE APPROACH IN BIODIVERSITY ACTIONS	Timeline for completing and validating a comprehensive gender analysis covering all biodiversity-related activties.	This indicator measures the timeline by which gender analysis covering all biodiversity-related activities is carried out and validated.	Date	-	December 2025	NBSAP Annual Report	Annually
	Timeline for developing a gender action plan and associated implementation tools for biodiversity programs.	This indicator measures the timeline by which a gender action plan and implementation tools are developed.	Date	-	December 2026	NBSAP Annual Report	Annually
	Trends in the number and proportion of biodiversity programs with gender-responsive measures integrated.	This indicator measures the trends in biodiversity programs with gender-responsive measures integrated.	Trends	-	Increase	NBSAP Annual Report	Annually
TARGET 16: BY 2030, PROMOTE SUSTAINABLE CONSUMPTION AND PRODUCTION TO REDUCE WASTE	Number of research studies undertaken on Sustainable Consumption and Production (SCP) practices.	This indicator measures the number of research undertaken on SCP.	Number	0	1	NBSAP Annual Report	Annually
	Timeline for adopting post-production waste reduction technologies in priority sectors.	This indicator measures the timeline by which post-harvest waste reduction technology adopted.	Date	-	December 2030	NBSAP Annual Report	Annually
	Timeline for implementing the Extended Producer Responsibility (EPR) framework.	This indicator measures the timeline by which the EPR is implemented.	Date	-	December 2030	NBSAP Annual Report	Annually
	Number of Public-Private Partnership (PPP) models implemented to promote SCP and waste management.	This indicator measures the number of PPP models developed and implemented.	Number	0	2	NBSAP Annual Report	Annually
	Trends in the percentage of waste generated at the source (household, industrail, commercial).	This indicator mesures the trends in percentage of waste generated at source.	Trends	-	Decrease	NBSAP Annual Report	Annually
	Trends in the quantity of waste generated due to improved raw materials efficiency and usage.	This indicator measures the trends in the quantity of waste generated through use of improved raw material.	Trends	-	Decrease	NBSAP Annual Report	Annually
TARGET 17: BY 2030, STRENGTHEN IMPLEMENTATION OF BIOSAFETY MEASURES	Timeline for intiating ractification to the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartegena Protocol.	This indicator measures the timeline by which ractification to the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol is initiated.	Date	-	December 2029	NBSAP Annual Report	Annually
	Timeline for intiating the revision of the Biosafety Act of Bhutan 2015.	This indicator measures the timeline by which the revision of Biosafety Act 2015 is initiated.	Date	-	December 2027	NBSAP Annual Report	Annually

TARGET 18: BY 2030, STRATEGIC INTERVENTIONS ON INCENTIVES ARE STREAMLINED TO SAFEGUARD BIODIVERSITY	Timeline for completing the identification, mapping, and assessment of incentives relevant to biodiversity conservation.	This indicator measures the timeline by which the identification, mapping, and assessment of incentives related to biodiversity is completed	Date	-	December 2025	NBSAP annual progress report	Annually
	Timeline for completing the review of existing policies and instruments related to biodiversity incentives.	This indicator measures the timeline by which the review of existing policies and instruments on incentives is completed	Date	-	December 2025	NBSAP annual progress report	Annually
	Timeline for prioritizing incentives that support biodiversity-positive outcomes.	This indicator measures the timeline by which prioritization of incentives for repurposing is completed.	Date	-	June 2025	NBSAP annual progress report	Annually
	Timeline for submitting recommendations for need-based repurposing of incentives with potential harmful impacts on biodiversity.	This indicator measures the timeline by which recommendation for need-based repurposing of harmful incentives is made.	Date	-	4	NBSAP annual progress report	Annually
TARGET 19: BY 2025, RESOURCES TO SUPPORT IMPLEMENTATION OF NBSAP ARE MOBILIZED	Timeline for conducting an assessment of the biodiversity and environment finance gap.	This indicator measures the timeline by which an assessment of the Biodiversity and Environment finance gap is conducted.	Date	-	December 2025	NBSAP annual progress report	Annually
	Timeline for developing a resource mobilization plan to support NBSAP implementation.	This indicator measures the timeline by which a resource mobilization plan for NBSAP implementation is developed.	Date	-	December 2025	NBSAP annual progress report	Annually
	Number of innovative financing mechanisms initiated to support biodiversity conservation and sustainable use.	This indicator measures the timeline by which innovative financing mechanisms is initiated for NBSAP implementation.	Number	-	4	NBSAP annual progress report	Annually
TARGET 20: BY 2030, STRENGTHEN CAPACITY BUILDING, PROMOTE TECHNOLOGY TRANSFER, AND FACILITATE TECHNICAL AND SCIENTIFIC COOPERATION	Number of inclusive awareness programs carried out on biodiversity conservation and sustainable management	This indicator measures the number of inclusive awareness conducted related to the biodiversity conservation and sustainable managment.	Number	-	13		Annually
	Number of technical capacity-building programs conducted for relevant stakeholders across sectors.	This indicator measures the number of technical capacity building programs provided to the relevant stakeholders.	Number	-	11		Annually
	Timeline for establishing biodiversity-focused technology hubs and knowledge-sharing platforms.	This indicator measures the timeline by which the technology hubs and knowledge sharing platforms are established.	Date	-	December 2030	NBSAP annual progress report	Annually
	Number of initiatives undertaken to promote technical and scientific cooperation for biodiversity conservation.	This indicator measures the number of initiatives undertaken to facilitate technical and scientific cooperation on biodiversity conservation.	Number	-	3	NBSAP annual progress report	Annually

LIST OF PARTICIPANTS FROM THE EASTERN REGIONAL CONSULTATION WORKSHOP HELD AT DRUK DEOTHJUNG RESORT, TRASHIGANG FROM 15 TO 17 JANUARY, 2025

Participant Name	Position Title & Position Level	Agency/Dzongkhag
1. Mr. Sonam Wangdi	Dzongkhag Planning Officer	Trashigang
2. Kinga Dechen	Assistant Dzongkhag Livestock Officer	Trashigang
3. Dezom	Dzongkhag Environment Officer	Trashigang
4. Phuntsho	Dzongkhag Land Record Officer (LRA)	Trashigang
5. Sherab Sengye	Chief Dzongkhag Engineer	Trashigang
6. Pasang Wangdi	Offg. Finance Officer (Account Assistant)	Trashigang
7. Jigme Tenzin	Dratshang Dungchen	Trashigang
8. Dorji Gyalpo	Principal DEO	Trashigang
9. Dorji Tshering	Udzorong Gup	Trashigang
10. Suraj Gurung	Assistant Dzongkhag Agriculture Officer	Trashigang
11. Dorji Khandu	RQI	BFDA Regional Office Trashigang
12. Sonam Tshering	Sr. Biodiversity Supervisor	CNCD
13. Thukten	Offg. Regional Director	RLDC, Kanglung
14. Daser Wangchuk	Horticulture Officer	ARDSC Khangma
15. Sonam Wangmo	Sr. Forest Officer	Trashigang Forest Division
16. Tshewang Tenzin	Forest Officer	Sakteng Wildlife Sanctuary
17. Shir Man Blon Tamang	Sr. Biodiversity Officer	CYCD, Lhuentse
18. Tshering Dorji	Dy. Chief Planning Officer	Trashiyangtse
19. Chada Jamtshok	Principal DEO	Trashiyangtse
20. Phurpa Tshering	Principal Livestock Officer	Trashiyangtse
21. Kinley Wangmo	DT Secretary (Offg. CDEO)	Trashiyangtse
22. Tandin Wangchuk	Sr. Land Registrar	Trashiyangtse
23. Nima Wangdi	Dzogkhag Executive Engineer (DE)	Trashiyangtse
24. Chhimi Dakpa	Assistant Dzongkhag Agriculture Officer	Trashiyangtse
25. Leki Zangpo	Dzongkhag EDMO	Trashiyangtse
26. Jamba Sonam	Thromde Thuemi	Trashiyangtse
27. Tenzin Chophel	Rabtey	Trashiyangtse
28. Lhakpa Tshering	Sr. SS	Trashiyangtse
29. Dechen Wangdi	Taedtsho Gup	Trashiyangtse
30. Karma Tenzin	Dzongkhag Agriculture Officer	Mongar
31. Sherab Tenzin	Chief Dzongkhag Engineer	Mongar
32. Norbu Tshering	Dzongkhag Livestock Officer	Mongar
33. Ugyen Yangzom	Thrizin Wom	Ngatshang, Mongar
34. Dema Yangzom	Thromde Thuemi	Mongar
35. Kinley Penjor	Survey Associate IV	Mongar
36. Pancha Man Rai	Sr. RQI	BFDA Regional Office Mongar
37. Karma Yangzom	Senior Horticulture Officer	ARDC, Wengkhar
38. Pema Thinley	Forest Ranger I	Phrumsengla National Park
39. Norbu Wangdi	Principal Forestry Officer	Mongar Forest Division
40. Thinley Wangdi	Dy. Chief Agriculture Officer	ARDSC Lingmethang
41. Lekzang	NWFP chairperson	Mongar

42. Sangay Tenzin	Principal Engineer	Pemagatshel
43. Jigyel Phuntsho Dargay	Thromde Thuemi	Pemagatshel
44. Sangay Thinley	Yurung Gup	Pemagatshel
45. Wangdi Phuntsho	Asst. Environment Officer	Pemagatshel
46. Dechen Wangmo	Lotus Women Group Representative	Pemagatshel
47. Deepen Gurung	Surveyor (Offtg. LRO)	Pemagatshel
48. Thinley Rabten	Chief DLO	Pemagatshel
49. Dawa Tshering	Dy. Chief Planning Officer	Pemagatshel
50. Tshering Dorji	ADAO	Pemagatshel
51. Cheki Wangdi	Forest Ranger I	Pemagatshel Forest Division
52. Jamyang Gyeltshen	DT Chair	Samdrup Jongkhar
53. Seldon	Thromde Thuemi	Samdrup Jongkhar
54. Ugyen Chophel	Sr. Forest Ranger I	Samdrup Jongkhar Forest Division
55. Tashi	Forest Ranger II	Jomotsangkha Wildlife Sanctuary
56. Kinzang	Sr. RQI	BFDA Regional Office, SJ

LIST OF PARTICIPANTS FROM THE CENTRAL REGIONAL CONSULTATION WORKSHOP HELD AT NORBU LINGKA RESORT, TRONGSA FROM 21 TO 23 JANUARY, 2025

Participant Name	Position Title & Position Level	Agency/Dzongkhag
1. Gembo Drukpa	DT Thrizin	Trongsa
2. Jamyang	Dzongkhag Planning Officer	Trongsa
3. Tashi Tobgay	Extension Supervisor	Trongsa
4. Sonam Choden Kalden	Agriculture Extension Supervisor	Nubi Gewog, Trongsa
5. Sangay Lhamo	Agriculture Extension Supervisor	Korphu Gewog, Trongsa
6. Tshendu	ADLO	Trongsa
7. Prem Sharma	RQI	BFDA Regional Office Trongsa
8. Sonam Dorji	Dy. Chief Forestry Officer	Jigme Singye Wangchuck National Park
9. Jampel	DT Thrizin	Bumthang
10. Jambay Dorji	Principal Livestock Officer	Bumthang
11. Jambay Wangmo	Sr. Extension Supervisor I	Bumthang
12. Tshewang Penjor	Asst. Engineer	Bumthang
13. Tshering Choden	Finance Officer	Bumthang
14. Sangay Choden	Asst. Dzongkhag Land Registrar	Bumthang
15. Nedup Dorjee	Sr. Surveyor IV	Bumthang
16. Chojay Tenzin	Sr. Planning Officer	Bumthang
17. Padam Bdr. Gurung	Manager	National Cattle Breeding Centre
18. Wangchuk	Offg. Program Director	National Development Centre for
19. Sonam Jamtsho	Manager	Animal Nutrition, Bumthang
20. Dr. Jambay Dorjee	Program Director	National Sheep Farm, Bumthang
21. Tashi	Manager	National Livestock Research Centre
22. Pema Yongdup	Forest Officer	National Equine Farm, Bumthang
23. Sangay Gyeltshen	Forest Officer	Bumthang Forest Division
24. Yeshey Nidup	Officer-In-Charge	Wangchuck Centennial National Park

25. Wangay	Gup	Zhemgang
26. Tashi Choden	Thromde Ngotshab	Zhemgang
27. Sangay Dorji	Livestock Production Officer	Zhemgang
28. Prem Lal Sharma	ADAO	Zhemgang
29. Sherab Thai	Drungchen	Zhemgang
30. Kinga Tshering	Environment Officer	Zhemgang
31. Tshewang Dorjee	Officer-In-Charge	BFDA Regional Office Zhemgang

LIST OF PARTICIPANTS FROM THE WESTERN REGIONAL CONSULTATION WORKSHOP HELD AT ZHINGKHAM RESORT, PUNAKHA FROM 27 TO 29 JANUARY, 2025

Participant Name	Position Title & Position Level	Agency/Dzongkhag
1. Sonam Dorji	Tshogdu Thrizin	Punakha
2. Ugyen Lhendup	Principal Livestock Officer	Punakha
3. Karma Dorji	Environment Officer	Punakha
4. Choney Dorji	DEO	Punakha
5. Sangay Dorji	PFO	Lamperi
6. Kinzang Thinley	Dzongkhag Tshogdu Thrizin	Wangdue Phodrang
7. Kinley Dorji	Thromde Thueme	Wangdue Phodrang
8. Rinzin Wangchuk	Dzongkhag Planning Officer	Wangdue Phodrang
9. Nado	ADAO	Wangdue Phodrang
10. Dorji Pasang	Chief DEO	Wangdue Phodrang
11. Pelden Lhamo	Environment Officer	Wangdue Phodrang
12. Sarita Gurung	Offtg. EDMO/Sr. GAO	Wangdue Phodrang
13. Ngawang Dorji	Offttg. DE	Wangdue Phodrang
14. Karma Tenzin	Assistant Finance Officer	Wangdue Phodrang
15. Phub Dorji	Dratshang Accountant	Wangdue Phodrang
16. Phub Dem	Matalungchu Water User Group	Wangdue Phodrang
17. Pema Ugyen	LPO	Wangdue Phodrang
18. Gem Gyeltshen	Dy. Chief RQO	BFDA Regional Office, Wangdue
19. Ramesh Kumar Siwakoti	Regulatory & Quarantine Inspector	BFDA, Wangdue Phodrang
20. Kinga Dorji	Dy. Chief LPO	NHDC, Wangdue
21. Tshewang	DT Thrizin	Gasa
22. Namgay	Thromde Thueme	Gasa
23. Karma Lhaki	Dzongkhag Agriculture Officer	Gasa
24. Thinley Jamtsho	Dzongkhag Livestock Officer	Gasa
25. Tshering Ngedup	Dzongkhag Environment Officer	Gasa
26. Kelzang Wangmo	Offtg. EDMO/LPO	Gasa
27. Dawa Tenzin	Dratshang Drungchen	Gasa
28. Rinzin Dorji	CFO	Jigme Dorji National Park
29. Dema Drukpa	Thromde Thuemi	Tsirang
30. Ugyen Dhendup	Offtg. Planning Officer/EDMO	Tsirang
31. Yam Bdr Mongar	ADLO	Tsirang
32. Bhuwan Chandra Ghalley	Principal, Damphu CS	Tsirang

33. Dorji Wandi	Dzongkhag Environment Officer	Tsirang
34. Tandin Dorji	Dzongkhag Land Record Officer	Tsirang
35. Kelzang Phuntsho	Offtg. Finance Officer	Tsirang
36. Beda Moni Chamlagai	Thrizin	Tsirang
37. Chhimi Dorji	Sr. FO	Tsirang Forest Division
38. Doley	Sr. Agriculture Supervisor	ARDC, Tsirang
39. Radhika Darjee	Sr. RQI	BFDA Regional Office, Tsirang
40. Bal Bdr Rana	DT Thrizin	Dagana
41. Jigme Dorji	Thromde Thueme	Dagana
42. Kishore Chettri	Offtg. DPO	Dagana
43. Indra Bdr Raika	Offtg. DAO/ADAO	Dagana
44. Ugyen Pem	CDEO	Dagana
45. Pempa Tshering	Environment Officer	Dagana
46. Sonam Phuntsho	DLRO	Dagana
47. Pema Yangden	EDMO	Dagana
48. Sundar Tamang	Offtg. FO	Dagana
49. Kinley Tshering	Accountant, Dratshang	Dagana
50. Hochu Leki	Cooperatives Representative FSO	Dagana
51. Gobin Tamang	Offtg. CD Engineer	Dagana
52. Ganesh K. Gurung	Sr. LPO	Dagana
53. Ugyen Tshering	CFO	Dagana Forest Division
54. Tsheltrim Rabzang	RQI	Bhutan Food and Drug Authority, Dagana
55. Tshochu	Chief DEO	Sarpang
56. Tenzin Phuntsho	Sr. Finance Officer	Sarpang
57. Cheki Wangmo	Environment Officer	Sarpang
58. Pema Dorji Tamang	Offtg. DAO	Sarpang
59. Sigyel Wangchuk	AE	Sarpang
60. Shekharpa	Sr. Livestock ES	Sarpang
61. Suk Dorji Yonzom	Gup	Sarpang
62. Arjun Gurung	Program Director	National Poultry Development Centre
63. Drukpola	Program Director	NDCA, Gelephu
64. Norbula	Sr. Laboratory Techncian	RVHEC, Gelephu
65. Sangay Wangdi	Research Officer	ARDC, Samtenling
66. Penjor Gyeltshen	Sr. RQI	BFDA Regional Office, Gelephu
67. Tshering Dorji	Sr. FO	Sarpang Forest Division
68. Dorji Wangchuk	Sr. Forest Ranger	Royal Manas National Park
69. Bal Krishna Koirala	Sr. FO	Phibsoo Wildlife Sanctuary

LIST OF PARTICIPANTS FROM THE WEST-CENTRAL REGIONAL CONSULTATION WORKSHOP HELD AT TASHI NAMGAY RESORT, PARO FROM 3 TO 5 FEBRUARY, 2025

Participant Name	Position Title & Position Level	Agency/Dzongkhag
1. Tshering N Penjor	Chief DAO	Paro
2. Loden Jimba	PLO	Paro
3. Tshewang Norbu	Dzongkhag Environment Officer	Paro
4. Cheten Zangmo	Assistant EDMO	Paro
5. Deki Lhamo	Thromde Ngotshab	Paro
6. Tandin	ADAO	Paro
7. Tshering Yangzom	LRA	Paro
8. Tshewang Dorji	Thrizin	Paro
9. Sherab Jatsho	Agriculture Officer	National Seed Centre, Paro
10. Pema Wangmo	Dy Ex. Engineer	AMTC, Paro
11. Tandin Wangdi	Sr. R&Q Inspector	BFDA Regional Office, Paro
12. Lham Dorji	FO	Paro Forest Division
13. Gado	DT Thrizin	Thimphu
14. Karma Chewang	CDAO	Thimphu
15. Kul Bdr Gurung	CDLO	Thimphu
16. Tshering Dorji	CDEO	Thimphu
17. Gembo Dorji	EDMO	Thimphu
18. Lekjay	Chief DE	Thimphu
19. Ugyen Tshewang	Dy. Chief Finance Officer	Thimphu
20. Wang Gyeltshen	Surveyor	Thimphu
21. Dr. D. B. Rai	Specialist II	National Dairy Development Centre
22. Dorji Wangchuk	Farm Manager	National Nucleus Pig Breeding Centre
23. Tshering Tobgay	Sr. Agriculture Officer	National Centre for Organic Agriculture
24. Tashi Wangdi	Program Director	National Soil Services Centre
25. Sabitra Pradhan	Sr. Mushroom Supervisor	National Mushroom Centre
26. Ugyen Tshering	Plant Protection Officer	National Plant Protection Centre
27. Chimi Lhamo	Sr. RQI	BFDA, Thimphu
28. Lekzang Jayoed Dorji	AEO	DECC, Thimphu
29. Ugyen Dorji	Offg. CFO	Thimphu Forest Division
30. Nakchung	Chief DE	Haa
31. Chimi Wangchuk	DAO	Haa
32. Dawa Dorji	DLO	Haa
33. Deki Pelden	Assistant Environment Officer	Haa
34. Tshewang Lhamo	Planning Officer	Haa
35. Tshering Chezom	Finance Officer	Haa
36. Tashi Chozom	Assistant EDMO	Haa
37. Golo Tshering	Sr. LHS	National Yak Farm, Haa
38. Singye Tshering	Program Director	NDDCR, Haa
39. Ugyen	Sr. Forest Ranger I	Jigme Khesar Strict Nature Reserve
40. Dhodo	Chief Dzongkhag Agriculture Officer	Chhukha
41. Sherab Tenzin	Chief Dzongkhag Livestock Officer	Chhukha
42. Ghana Sham Khatiwara	Dzongkhag Planning Officer	Chhukha

43. Kunzang Gyelmo	Assistant Land registrar	Chhukha
44. Karma Tshewang	Environment Officer	Chhukha
45. Tshering Wangchuk	Engineer	Chhukha
46. Shanta Man Ghalley	Thromde Thuemi	Chhukha
47. Kinley Dorji	Thrizin Wom (Geling gewog gup)	Chhukha
48. Karma	EDMO	Chhukha
49. Choki Dorji	Jigmechhu Ecotourism	Chhukha
50. Tshering Wangdi	RQI	BFDA Regional Office, Gedu
51. Sonam Tobgay	Sr. RQI	BFDA Regional Office, Phuentsholing
52. Yeshey Gyeltshen	FO	Gedu Forest Division
53. Chogyel Norbu	Dy. Chief Agriculture Officer	Samtse
54. Jigme Tshelthrim	Planning Officer	Samtse
55. Chador	Dzongkhag Land Registrar	Samtse
56. Nima Drukpa	Thrizin	Samtse
57. Som Kumar Pradhan	Thromde Ngotshab	Samtse
58. Tshering Dorji	Dratshang Drungchen	Samtse
59. Tashi Lhendup	Officer-In-Charge	BFDA, Samtse
60. Kuenley Gyeltshen	Chief Forestry Officer	Samtse Forest Division

LIST OF PARTICIPANTS FROM THE PRIVATE CONSULTATION WORKSHOP HELD AT HOTEL LEGPHEL, PHUENTSHOLING ON MARCH 5, 2025

Participant Name	Position Title & Position Level	Agency/Company/Industry
1. Yangchen Lhamo	Administrative Assistant	Druk Wang Alloys Limited, Pasakha
2. Chhheaten Tshering	Manager	Bhutan Wood Panel Industry
3. Pema Chozom	Assistant Accountant	Dralha Flour Mill
4. Phub Wangdi	Development Officer	Dralha Flour Mill
5. Dr. Manohar Sharma	General Manager	Bhutan Milk and Agro Private Ltd
6. Sonam Beedha	Procurement Officer	Suntalakha Stone Quarry
7. Deki Wangmo	Manager	Pendhey Jungney Engineering Workshop
8. Dipa Kumari	Office Assistant	Pendhey Jungney Engineering Workshop
9. Karma Wangdi Tamang	Proprietor	Yangtsho Exports and Minerals
10. Sonam Thubten	Administrative Officer	Tashi Metals Private Limited
11. Pema Wangdi	Environment Focal	Pelden Enterprise Limited
12. Chimi Dorji	Adm	Kinjore Brewery Pvt Ltd, Pasakha
13. Chencho Dendup	Engineer	Bhutan Power Corporation Limited
14. D. K. Chhetri	General Manager	Bank of Bhutan Limited, Phuentsholing
15. Dorji Wangchuk	Branch Manager	Bhutan National Bank Limited
16. Tshering Tobgay	Credit Officer	Tashi Bank, Phuentsholing
17. Sangay Pema	Material Management Division Head	Druk Green Power Corporation
18. Yangzom	Administrative Officer	Bhutan Chamber of Commerce and Industry

LIST OF PARTICIPANTS FROM THE NATIONAL CONSULTATION WORKSHOP HELD AT THIMPHU DELUXE, THIMPHU ON MARCH 21, 2025

Participant Name	Position Title & Position Level	Agency/Organization
1. Phub Dem	Advisor	DAMC, MoAL
2. Dr. Min Prasad Timsina	Advisor	DoL, MoAL
3. Namgyel Wangchuk	Dy. Chief Planning Officer	DHS, MoH
4. Namgyel Dorji	CO	DMDF, MoF
5. Lekzang Jayoed Dorji	AEO	DECC, MoENR
6. Jamyang Lophyal	Dy. Chief Marketing Officer	DAMC, MoAL
7. Karma W Tashi	Chief Planning Officer	PPD, MoHA
8. Jigme Lhendup	Planning Officer	PPD, MoENR
9. Pema Lhaden	Program Officer	DWPSD, MoESD
10. Palden Lhamo	Asst. Planning Officer	PPD, MoICE
11. Kezang Wangchuk	Desk Officer	DMA, MoFAET
12. Namzang Dema	Planning Officer	PPD, MoIT
13. Jigme Tenzin	RMPM	FAO Bhutan
14. Lhap Dorji	Portfolio Manager	UNDP
15. Tshering Yuden	Program Officer	Bhutan For Life
16. Norbu Yangdon	Project Coordinator	World Wildlife Fund Bhutan
17. Tshering Tenzin	CEO	MSPCL
18. Namgay Dhendup	Nature-Based Solutions Specialist	Bhutan Ecological Society
19. Ugyen	CEO	Bio-Bhutan
20. Dorji Gyeltshen	Sr. Menpa	National Traditional Medicine Hospital

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