Conservation Plan

Version: June 19, 2018

Table of Contents

Acronyms used in this document

BC	Biological Corridor
BFL	Bhutan for Life
BTFEC	Bhutan Trust Fund for Environmental Conservation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of Parties
CVCA	Climate Vulnerability and Capacity Assessment
DoFPS	Department of Forests and Park Services
GECC	Gewog Environment Conservation Committee
GEF	Global Environment Facility
HWC	Human-wildlife conflict
IWRM	Integrated water resource management
METT	Management Effectiveness Tracking Tool
MoAF	Ministry of Agriculture and Forests
NBSAP	National Biodiversity Strategies and Action Plan
NDCs	Nationally Determined Contributions
NEC	National Environmental Commission
NGO	Non-governmental organization
NLC	National Land Commission
NP	National Park
NWFP	Non-wood forest product
PA	Protected Area
PES	Payment for Ecosystem Services
PFP	Project Finance for Permanence
RGoB	Royal Government of Bhutan
RSPN	Royal Society for the Protection of Nature
SDG	Sustainable Development Goal
SMART	Spatial Monitoring and Reporting Tool
SNR	Strict Nature Reserve
TBD	To be determined
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WS	Wildlife Sanctuary
WWF	World Wildlife Fund

Executive Summary

Background on Conservation in Bhutan

Bhutan, although one of Asia's smallest countries, has one of the biggest commitments to conservation. With one of the highest proportions of forest cover in Asia at 70.46%, Bhutan has protected land that is rich in forests, pristine rivers and thriving wildlife. Located at the heart of the Eastern Himalayas, Bhutan is part of one of the world's 10 most biodiverse regions.

Bhutan's forest cover is important to sustain ecosystem services that are critical to the country's climate resilience[1] such as reduced run-off, improved groundwater re-charge, reduced erosion, and improved water quality. The forests also provide local communities with timber for housing, and non-wood forest products. In addition, tourism is a growing industry with the potential for providing increased economic opportunities for local people.

Bhutan's environment also benefits the region and the world by providing clean water, clean air, and carbon sequestration. Bhutan's rivers, which flow into neighboring India, Bangladesh and beyond, are part of a network of rivers emanating from Asia's "water towers" that provide water for at least one-fifth of the world's population. Its forests sequester more than 6 million tons of carbon dioxide annually, which is four times more than what Bhutan emits.

Bhutan's current conservation and biodiversity status is a result of the far-sighted vision and leadership of its Kings, and the country's centuries-long tradition of living in harmony with nature. The Royal Government of Bhutan (RGoB) further strengthened its commitment in the 1970s by formally adopting the development philosophy of Gross National Happiness, which includes environmental conservation as one of its four pillars. Guided by the principles of Gross National Happiness, the RGoB requires that a minimum of 60% of Bhutan's total land be under forest cover for all time, a requirement subsequently enshrined within Bhutan's constitution.

Bhutan's protected area network – which consists of 10 protected areas linked by biological corridors – covers more than 51% of the country's total area. These landscapes contain a vast repository of ecosystems, species, and genetic diversity, and play a critical role in supporting socioeconomic and environmental health within and around Bhutan. This system is also especially critical to the country's climate resilience, providing connectivity between habitats and refugia[2] that these ecosystems and species will need to adapt to ever-increasing temperatures and climate change impacts.

Bhutan's protected area network therefore has immense potential to contribute to the U.N.'s Sustainable Development Goals, especially those related to environmental sustainability, poverty

1 Climate resilience is the ability of a social-ecological system to absorb and recover from shocks and disturbances, maintain functionality and services by adapting to chronic stressors, and transform when necessary.
2 Climate refugia are areas within a particular landscape that are likely to see less change, or be less affected by climate change than other areas; also referred to as "high climate resilience value habitats".

alleviation, food security, and water quality. Bhutan's 2014 National Biodiversity Strategies and Action Plan (NBSAP) also requires that current protected areas be maintained with enhanced management effectiveness and financial sustainability, in accordance with the Aichi targets and objectives of United Nations Convention on Biological Diversity. Similarly, Bhutan's Nationally Determined Contributions (NDCs) prioritize integrated water resource management (IWRM), climate-resilient agriculture, sustainable forest management and conservation, and disaster risk reduction – all of which directly rely on, and are a critical component of the country's protected area network.

New Pressures Within and Outside Bhutan

For decades, the government of Bhutan has stayed true to its environmental commitments. However, times are changing and new pressures are rising up. The following factors are poised to have a major detrimental impact on Bhutan's ecosystem services and biodiversity:

- Human-wildlife conflict in the form of livestock depredation and crop damage is a growing concern, posing serious threats to livelihoods and quality of life
- Poachers and illegal logging operations are entering wild areas with increasing frequency (often crossing borders to do so), and in numbers that Bhutan's current enforcement capacity is unable to match
- Pressures from a rising human population, agriculture, livestock and hydropower development are causing habitat loss, fragmentation and degradation.
- A shortage of protected area staff, infrastructure, and equipment leads to ineffective and inefficient provision of services to local communities
- Climate change is causing increasingly erratic rainfall patterns, flash floods, landslides, windstorms, fires, drought, and new pest and disease patterns, leading to declines in agricultural productivity, over-exploitation natural resources, and increased vulnerability of local communities
- A high rural poverty rate and absence of alternative income sources is leading to exhaustive natural resource depletion, and persistent rural-urban migration (especially among young people) means fewer local stewards of the land in protected areas (just as pressures from outside Bhutan are increasing)
- External support to Bhutan has been declining in recent years, and will continue decreasing with Bhutan's transition to middle-income status
- There is ever-rising pressure to mine and build on land in or near Bhutan's protected areas

In the absence of a comprehensive financial and political solution, these factors will have profound effects on Bhutan's extremely diverse ecosystems, traditional livelihoods and cultures, and development trajectory. In addition, Bhutan's protected area network is relatively young – the majority of its protected areas were created in the 1990s, with the most recent in 2008 – and therefore still requires key capacity investments to operate effectively.

Bhutan for Life Vision and Approach

The vision of Bhutan for Life (BFL) is that the people of Bhutan preserve and enhance their natural heritage to benefit their country and the planet for posterity. To do so, BFL will ensure a robust network of protected areas and biological corridors (representing more than 51% of Bhutan, 35,000 inhabitants, and half of the population living in rural areas downstream) that contributes to human well-being and biodiversity conservation, and increases Bhutan's resilience to the effects of climate change. A robust network of protected areas is envisaged to be:

- a sanctuary for the diversity and persistence of life
- a provider of sustainable, resilient ecosystem goods and services
- a reservoir for carbon and adaptation to climate change
- a source of economic opportunity and community well-being
- an exemplar of effective management and efficient services.

Bhutan for Life's vision will be achieved by mobilizing – in a single agreement – all the governmental, financial and other commitments needed to develop Bhutan's network of protected areas and maintain it forever. The approach – called Project Finance for Permanence (PFP) – is based on a private sector practice of fully financing large, complex, well-defined projects through a set of rigorous plans and conditions that all main private and public sector partners agree to in advance[3].

The Bhutan for Life PFP effort is comprised of a:

- Set of specific, measureable, time-bound conservation and socioeconomic Goals, Milestones and supporting Activities
- Detailed financial model with cost estimates, and financial targets for donors and new funding generated within Bhutan
- Transition fund to hold BFL donor funds, which will be entirely spent down over the 14-year implementation period as the RGoB increases its spending – in part by creating new funding sources within Bhutan – until it fully assumes the costs of running the protected area network

In accordance with the PFP approach, the BFL transition fund will be launched only when (1) the total fundraising commitment target has been reached, and (2) all key legal and financial conditions necessary to secure the deal (the closing conditions) are in place. A board consisting of donors, government and other partners will oversee the transition fund and disburse funds each year, as long as pre-determined disbursement conditions (e.g. achievement of Milestones, increasing RGoB financial contributions, financial transparency, etc.) continue to be met. This ensures that all financial needs to cover Activities are committed from the start, and creates financial incentives to minimize the risk of partners not meeting their obligations throughout implementation.

3 To date, three PFP initiatives have reached agreements and started implementation: ARPA for Life in Brazil's Amazon, Forever Costa Rica, and Canada's Great Bear Rainforest. Peru's Natural Legacy and Heritage Colombia are the other PFPs currently in development.

Why Bhutan for Life Now?

Using the PFP approach, BFL will guarantee long-term protection of Bhutan's network of protected areas to secure human well-being and biodiversity conservation. It will also produce the following benefits:

1. Help achieve Aichi targets and objectives of United Nations Convention on Biological Diversity
2. Support Bhutan's commitment to remain carbon neutral under the United Nations Framework Convention on Climate Change
3. Help maintain the constitutional requirement of 60 percent forest cover for perpetuity
4. Contribute to Bhutan's Gross National Happiness philosophy by conserving Bhutan's environment
5. Demonstrate Bhutan's global leadership in balancing conservation with economic development
6. Leverage significant amounts of new funding

To produce those benefits, selected Bhutan for Life impacts include:

- Tiger population increased by 20% over 2015 levels
- Zero Poaching Framework and SMART/effective patrolling instituted throughout protected area network
- Delineation of biological corridors to maintain habitat and ecosystem contiguity
- A stretch of river designated free-flowing and effectively managed
- Ten catchments improved for climate resilience, wildlife, and socio-economic development
- National Five Year Plans that incorporate natural capital valuation and key ecosystem services
- 1.1 million hectares of forests maintained, thereby sequestering 240 million tons[4] of carbon dioxide equivalent
- 80% of all households within PAs benefit from reduced human wildlife conflict, and have increased access to nature-based employment and income-generating opportunities including ecotourism, enhancing their resilience to climate change
- All protected areas and biological corridors equipped with adequate and competent staff, and essential equipment and infrastructure
- Approximate doubling of long-term funding for the protected area network from USD $3.4M/year to $7.1M/year[5]

However, if action is not taken now to address the challenges Bhutan is facing, there is no guarantee that Bhutan's forests will remain intact. The country is at risk of losing or degrading the forests and other natural resources it has worked so hard to protect.

In addition, Bhutan is heavily dependent on external donors to support development and conservation. However, as Bhutan transitions to middle-income status, bilateral and multilateral partners will withdraw financial support, resulting in fewer financial resources for conservation.

4 The 240M tons figure is derived from 206.2M tons stored in 1.1M hectares of existing forest + (2.6M tons sequestered per year from natural growth x 14 year BFL implementation period).

5 Exact figures will fluctuate based on economic and other variables.

These factors, coupled with significant and urgent financial needs for Bhutan's protected areas, make now an opportune time for the RGoB and partners to pursue BFL. Under the visionary leadership of Bhutan's Monarchs, and with support from the RGoB, the initiative will support rural prosperity and environmental conservation priorities of the RGoB, contribute to the Wangchuck dynasty's pedigree of environmental leadership, and serve as a model for the world.

Background on Conservation in Bhutan

Significance and Benefits

Bhutan, although one of Asia's smallest countries, has one of the biggest commitments to conservation. With one of the highest proportions of forest cover in Asia at 70.46%, Bhutan has almost 2 million hectares of protected land that is rich in forests, pristine rivers and thriving wildlife. Located at the heart of the Eastern Himalayas, Bhutan is part of one of the world's 10 most biodiverse regions. It includes parts of 3 global biodiversity hotspots, 60 ecoregions, 330 Important Bird Areas, 53 Important Plant Areas, and a large number of wetlands including 3 Ramsar Sites[6].

Bhutan's forest cover is important to sustain ecosystem services that are also critical to the country's climate resilience such as run-off, groundwater re-charge, limiting erosion (for example, by stabilizing slopes in steep areas), and maintaining water quality. Due to these intact forests, in many rural areas, the water supply for drinking, sanitation and irrigation is pristine and does not require chemical treatment. The forests also provide local communities with timber for housing, and non-wood forest products such as animal fodder, medicinal plants, and many others. In addition, as knowledge about Bhutan's rich biodiversity spreads, the tourism industry is growing, providing increased economic opportunities for local people.

Bhutan's environment also benefits the region and the world by providing clean water, clean air, and carbon sequestration. Bhutan's rivers, which flow into neighboring India, Bangladesh and beyond, are part of a network of rivers emanating from Asia's "water towers" that provide water for at least one-fifth of the world's population. Its forests sequester more than 6 million tons of carbon dioxide annually – four times more than what Bhutan emits[7].

Enabling Policy Environment

Bhutan's current conservation and biodiversity status is a result of the far-sighted vision and leadership of its Kings, and the country's centuries-long tradition of living in harmony with nature. The Royal Government of Bhutan (RGoB) further strengthened its commitment in the 1970s by formally adopting the development philosophy of Gross National Happiness, which includes environmental conservation as one of its four pillars. This policy affirms that Bhutan's economy should develop in a manner that preserves its unique natural heritage.

Guided by the principles of Gross National Happiness, the RGoB has sought to mainstream environmental concerns into national planning. The declaration of Royal Manas National Park in 1966[8], and the Forest Act of 1969 (specifically to protect forests) formed the first modern legislation. Soon after, the National Forest Policy of 1974 specified that a minimum of 60% of Bhutan's total land be under forest cover for all time – a requirement that was subsequently enshrined within Bhutan's

6 http://www.ramsar.org/wetland/bhutan.

7 Second National Communication from Bhutan to the UNFCCC, 2011.

8 Royal Manas was declared a Wildlife Sanctuary in 1966, and was upgraded to National Park in 1988.

constitution (adopted in 2008). Bhutan is one of the few countries that features environmental conservation so explicitly in its constitution.

A major milestone in 1993 was the declaration of a comprehensive network of protected areas representing major ecological zones – and in 1999, designation of biological corridors linking all protected areas to allow wildlife to move among them. This system of protected areas and biological corridors constitutes Bhutan's protected area network, which now covers more than 51% of the country. These landscapes contain a vast repository of ecosystems and species diversity, and play a critical role in supporting socioeconomic and environmental health within and around Bhutan. This system is also especially critical to the country's resilience to climate change, providing the connectivity between habitats and refugia that these ecosystems and species will need to adapt to ever-increasing temperatures and climate change impacts. Since the 1990s, the RGoB has enacted other significant environmental legislation, and Bhutan's 2020 Vision strategy document[9] emphasizes the country's natural heritage and its potential to support socioeconomic development towards realization of Gross National Happiness.

International Commitments and Recognition

The recently adopted Sustainable Development Goals (SDGs) underpin biodiversity as sources of livelihoods through ecosystem services. Bhutan's protected area network therefore has immense potential to contribute to the global SDGs, especially those relating to environmental sustainability, poverty alleviation, food security, and water quality.

Bhutan's 2014 National Biodiversity Strategies and Action Plan (NBSAP) clarifies linkages and synergies with international biodiversity targets and frameworks. For example, the NBSAP's National Biodiversity Target 11 requires that current protected areas be maintained with enhanced management effectiveness and financial sustainability, in accordance with the Aichi targets and objectives of United Nations Convention on Biological Diversity. Similarly, Bhutan declared that it would remain carbon neutral at 2009's United Nations Framework Convention for Climate Change Conference of Parties (COP 15), and in 2016 Bhutan's National Assembly unanimously ratified the Paris Climate Agreement, reinforcing the nation's contribution and continued leadership in climate action. Bhutan's Nationally Determined Contributions (NDCs) prioritize integrated water resource management (IWRM), climate-resilient agriculture, sustainable forest management and conservation, and disaster risk reduction – all of which directly rely on, and are a critical component of the country's protected area network.

At the global level, Bhutan is signatory to all three Rio Conventions: the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (UNCBD) and the United Nations Convention to Combat Desertification (UNCCD). In keeping with Bhutan's strong environmental conservation history and commitment to the global process in addressing environmental concerns, it is now party to a total of 15 regional and international environment agreements and treaties.

The world has recognized Bhutan's strong conservation efforts through a multitude of global recognitions and awards. The most notable include the United Nations Environment Program

9 Bhutan 2020: A Vision for Peace, Prosperity and Happiness, RGoB Planning Commission, 1999.

Champions of the Earth Award in 2005; the John Paul Getty Conservation Award in 2006; and the induction of His Majesty the Fourth King, Jigme Singye Wangchuck, into the Kyoto Hall of Fame in 2011.

Bhutan for Life Conservation Vision and Scope

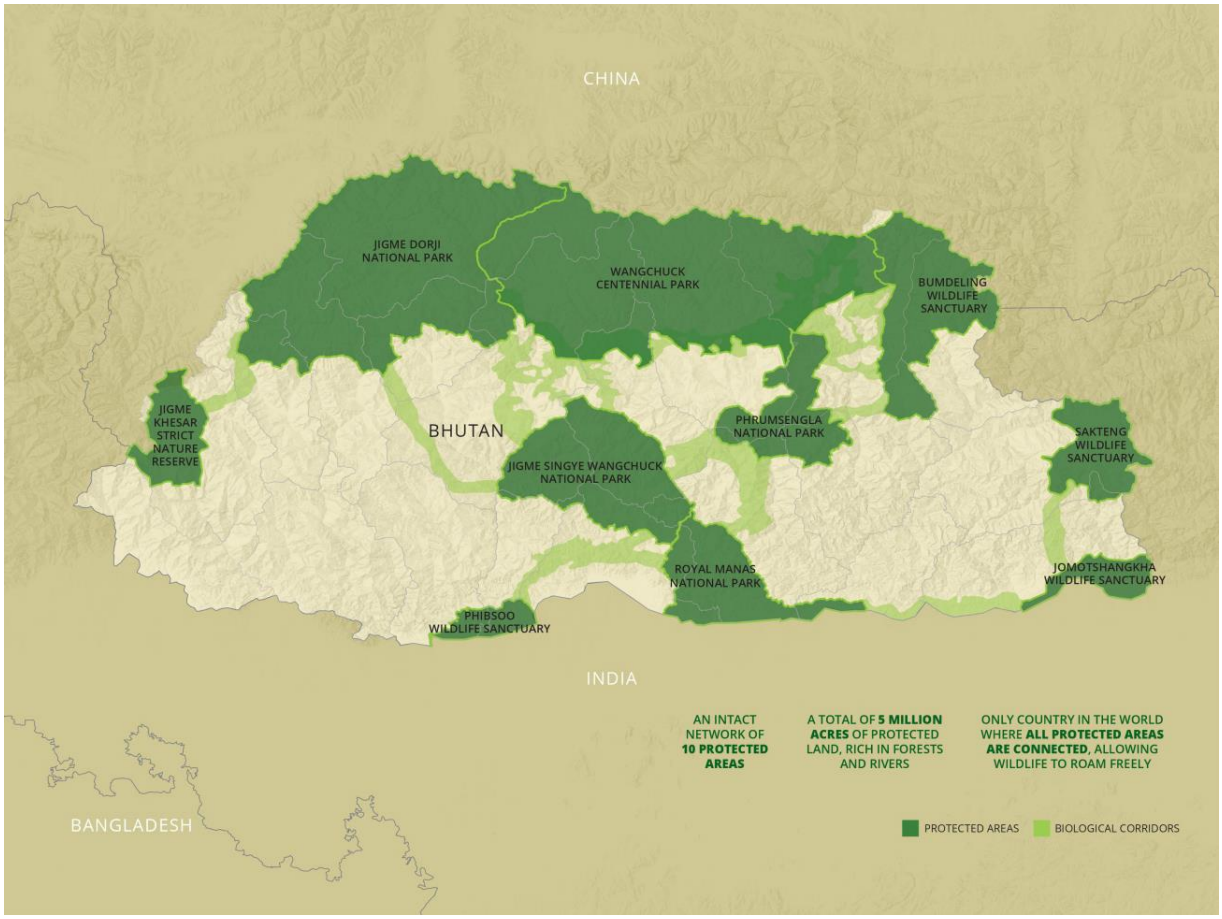
Vision
People of Bhutan preserve and enhance their natural heritage to benefit the country and the planet for posterity

Mission and Five Themes
Ensure a robust network of protected areas and biological corridors in Bhutan (representing more than 51% of the country) that contributes to human well-being and biodiversity conservation, and increases Bhutan's resilience to the effects of climate change. A robust network of protected areas is envisaged to be:

- a sanctuary for the diversity and persistence of life
- a provider of sustainable, resilient ecosystem goods and services
- a reservoir for carbon and adaptation to climate change
- a source of economic opportunity and community well-being
- an exemplar of effective management and efficient services.

Scope
Bhutan for Life includes 10 protected areas (and the Royal Botanical Park) and 8 biological corridors that together constitute 51.44% of the area of Bhutan. There are 35,000 people (7,000 households) living within the protected area network[10], most of whom depend on natural resources for their livelihoods. In addition, approximately 110,000 people living in rural areas less than 10 km from protected area borders, and almost half Bhutan's population living in rural areas downstream benefit from an array of ecosystem services that protected areas provide. (See next section for more information on how communities interact with and benefit from the protected area network.)

10 Population and Housing Census of Bhutan, 2005.



Protected Areas and Biological Corridors

(protected areas listed by size, largest to smallest)

Protected Area	Legal Notification Year	Dzongkhags (Districts)	Total Area (sq.km)
Wangchuck Centennial National Park	2008	Gasa, Wangduephodrang, Bumthang, Trongsa , Lhuentse	4,914.00
Jigme Dorji National Park	1993	Punakha, Gasa, Thimphu, Paro	4,316.00
Jigme Singye Wangchuck National Park	1993	Trongsa, Wangdue, Sarpang, Tsirang, Zhemgang	1,730.00
Bumdeling Wildlife Sanctuary	1993	Trashiyangtse, Lhuntse, Mongar	1,520.61
Royal Manas National Park	1993	Sarpang, Zhemgang	1,057.00
Phrumsengla National Park	1993	Bumthang, Lhuntse, Mongar, Zhemgang	905.05

Protected Area	Legal Notification Year	Dzongkhags (Districts)	Total Area (sq.km)
Sakteng Wildlife Sanctuary	1993	Trashigang, Samdrup Jongkhar	740.60
Jigme Khesar Strict Nature Reserve	1993	Haa	609.51
Jomotsangkha Wildlife Sanctuary	1993	Samdrup Jongkhar	334.73
Phibsoo Wildlife Sanctuary	1993	Sarpang, Dagana	268.93
Total Area of 10 Protected Areas			**16,396.43**
8 Biological Corridors (BCs)	1999	Haa, Paro, Thimphu, Punakha, Wangduephodrang, Sarpang, Tsirang, Trongsa, Zhemgang, Bumthang, Mongar, Lhuentse, Trashigang, Samdrup Jongkhar	3,307.14
Royal Botanical Park	2004	Thimphu, Punakha	47.00
Total Area of Protected Area Network (10 protected areas + 8 biological corridors + Royal Botanical Park)			**19,750.57**

Situation Analysis

This section summarizes the main ecosystem services the protected area network provides to people within and outside of Bhutan; the biodiversity contained within the network; and the various factors expected to significantly affect ecosystem services and biodiversity over the next 10 years. (For information on the interventions included within Bhutan for Life and how they will impact ecosystem services and biodiversity, see the *BFL Goals, Milestones and Activities* section.)

Ecosystem Services and Benefits to People

Bhutan's economy is largely dependent on natural resources. Its protected area network is comprised of multipurpose landscapes that provide clean water, carbon sequestration, enhanced resilience against impacts of climate change, livelihood opportunities, and vehicles for participatory engagement with local communities and other stakeholders. The initial estimate of the total value of the country's ecosystem services is about USD $15.5 billion per year, approximately five times country's GDP[11]. This estimate includes services such as climate regulation ($3.5B per year) tourism/recreation ($3B), biodiversity protection ($3B), air quality ($2.5B), pollination ($1B), and food ($0.7B), among many others.

Clean and regulated water for domestic, agricultural, and ecological needs

By providing high-quality freshwater, the protected area network plays a pivotal role and contributes significantly to the wealth and welfare of the country. Through its forested catchments, Bhutan's

11 "An initial estimate of the value of ecosystem services in Bhutan", Kubiszewski et al, 2012.

protected area network supplies a high proportion of the water for domestic, agricultural, and ecological needs. Agriculture and livestock are the main sources of livelihood for 56.7% of Bhutan's population[12], and many households practice subsistence mixed farming. Their livelihoods depend directly on the clean water provided by the relatively well-preserved forests and appropriate watershed management practices. In addition, intact forests help regulate water through reduced erosion, slower runoff, and better aquifers' recharge. These services are critical to the country's resilience to increasing climate change impacts – especially those affecting forests and water supplies, such as increasing variability, frequency and intensity of extreme weather events like heavy downpours and droughts – and are therefore a central priority of Bhutan's NDCs.

Carbon sequestration and avoided emissions
Bhutan's protected area network currently stores approximately 206.2 million tons of carbon dioxide equivalents (based on 1.1 million hectares of existing forest within the network). Bhutan in 2009 made a bold declaration to "keep absorbing more carbon than we emit – and to maintain our country's status as a net sink for Green House Gasses". Protected areas therefore have substantial contribution to Bhutan's commitment to remain carbon neutral and join global collective efforts the UNFCCC in addressing climate change issues.

Enhanced resilience against impacts of climate change
The Protected Areas Natural Solutions to Climate Change policy brief and Bhutan's NDCs show how protected areas can contribute to climate change mitigation and facilitate adaptation to climate change risks and impacts by maintaining or increasing ecosystem health through carbon sequestration and storage, biodiversity conservation, nutrient cycling, agricultural pollination, protection from flooding and other natural disasters, cultural services, and ecotourism. Additionally, they provide food, fuel, building materials and medicines, as well as a significant proportion of the drinking water. As noted above, the protected area network, connected by corridors, provides additional climate resilience for the country's biodiversity, allowing important species to migrate to new habitats as temperatures rise and climate patterns continue to shift.

Non-wood forest products (NWFPs)
Communities living within the protected area network depend on the sustainable use of biodiversity for edible plants, fruits, animal fodder, leaf litter for farmyard manure, medicinal and aromatic plants, wild orchids, bamboo and cane for handicrafts and household implements, pulp for traditional paper-making, and a wide range of other non-wood forest products.

Diversified economic base through nature-based tourism and enterprises
A well-managed protected area network presents significant opportunities for nature-based tourism to explore natural areas and its wildlife. Tourism development in a protected area can enhance economic development, quality of life, resilience to climate change impacts through diversified incomes, and protection of cultural and natural heritage for nearby communities (especially in those PAs that best represent the countries' biological and cultural richness). The tourism industry in Bhutan, second in size only to hydropower, generated USD $73.2 million in revenue in 2014[13] - significantly more than in 2013,

12 Bhutan's Labor Force Survey, 2014.
13 Tourism Council of Bhutan

due partially to increasing regional tourism. Tourism is a growing industry, with the potential to provide increased job opportunities for local people. However, currently the protected areas lack sufficient capacity and infrastructure to support increased nature-based tourism.

Cultural benefits

The country's natural environment is also important for its cultural resources. Secluded natural landscapes preserve the country's rich cultural heritage. Sacred places such as *Singye Dzong*, *Aja Ney* and *Rigsum Goempa* lie in the tranquil surroundings of Bumdeling Wildlife Sanctuary. In Jigme Dorji National Park, Mount *Jhomolhari* – the country's most famous peak – is worshipped by the local populace. In the same park, *Gasa Tshachhu* hot springs are visited by hundreds of pilgrims each year for its curative properties. There are also a number of unique ethnic communities – for example, the *Layaps* in Jigme Dorji National Park, the *Monpas* in Jigme Singye Wangchuck National Park and the *Brokpas* in Sakteng Wildlife Sanctuary – who have sustained their way of life in close interaction with the natural environment for many years. Conserving wild areas also allows Bhutan's Buddhist citizenry to maintain a deeply held cultural and religious value–ensuring balance between humans and nature.

Community participation in protected area management

The over 7,000 households living within the protected area network have traditionally depended its resources for subsistence goods and services for their livelihoods. These communities are a reservoir for traditional knowledge and skills regarding resource management that will be critical to adapt to increasingly damaging impacts of climate change. Therefore, there is a significant opportunity to integrate sustainable, climate-resilient management of these areas through involvement of local communities. Platforms that ensure open discussion of relevant issues, problems, and solutions are key. This kind of involvement integrates environmental and social concerns into decision-making processes, and support sustainable management without compromising the rights and wellbeing of local communities.

Biodiversity: Focal Species and Habitats

Bhutan's landscape is highly mountainous and rugged with elevations ranging from 160 m to nearly 7,500 m. The protected area network of Bhutan is regarded as one of the most comprehensive in the world. It encompasses a continuum of representational samples of all major ecosystems found in the country, ranging from the tropical/sub-tropical grasslands and forests in the southern foothills through temperate forests in the central mountains and valleys, to alpine meadows in the northern mountains[14].

The country experiences a wide range of climatic zones stretching from the humid subtropical in the south to cool alpine in the north. These climatic zones, coupled with local microclimates, support a wide range of ecosystem diversity that house a diverse assortment of flora and fauna. Bhutan ranks in the top ten percent of countries with the highest species density (species richness per unit area[15]), and is home to about 5600 species of vascular plants (including 105 endemic plants); close to 200 mammal species (including 8 species of cats, and 27 globally threatened such as tiger, red panda, golden langur, capped langur, wild dog, and takin); and around 700 birds (including 4 species of hornbill).

14 National Environmental Commission (NEC), 2009.

15 http://www.fao.org/docrep/007/ad103e/ad103e03.htm

One of the notable birds is the critically endangered White Bellied Heron; 47% of the total global population of White Bellied Herons is found in Bhutan[16]. Bhutan is also one of the few tiger range countries to have a healthy breeding population of tigers, as revealed by 2015's National Tiger Survey that estimated a thriving population of 103 tigers[17]. In addition, new records of lesser-known species such as herpetofauna (reptiles and amphibians), invertebrates, and aquatic species continue to be established every year.

Below is a brief description of the focal species and habitat types associated with Bhutan for Life. The purpose of this list is to identify a limited number of species and habitats that represent or benefit the preservation of important ecosystem services or conservation of many other endangered species or habitats, and which are not prohibitively difficult or expensive to monitor (e.g. keystone, focal, umbrella, and/or indicator species and habitats). This list may be expanded as surveys for additional habitats or species are conducted.

#	Focal Species and Habitats	Reasons for Selection related to Ecosystem Services and Benefits to People	Reasons for Selection related to Biodiversity
1	Alpine meadows and shrubs	Clean water, grazing areas, enhanced climate resilience, nature-based tourism, non-wood forest products, including medicinal and aromatic plants (e.g. cordyceps)	Support apex predators (snow leopard, wolf, brown bear) and their prey species, takin; plant endemism; threatened due to poor grazing practices
2	Wetlands	Enhanced climate resilience, flood retention, sustained and regulated water, nature-based tourism	Contain important bird habitats; aquatic biodiversity (fish, amphibians, plants, etc.); water sources for wildlife
3	Conifer forests	Clean water, carbon sequestration and avoided emissions, enhanced climate resilience, nature-based tourism, cultural benefits, watershed slope stabilization	Support biodiversity (trees such as hemlock, yew, pine, fir, and specialist mammals such as tiger, leopard, red panda, musk deer, black bear, marten, also white bellied heron); threatened due to poor grazing practices, anthropogenic forest fires, some timber and firewood extraction, and debilitating effects of climate change makes them vulnerable to disease and pests

16 Royal Society for the Protection of Nature (RSPN) and Department of Forests and Park Services (DoFPS), 2015 DoFPS, 2015.
17 DoFPS, 2015.

#	Focal Species and Habitats	Reasons for Selection related to Ecosystem Services and Benefits to People	Reasons for Selection related to Biodiversity
4	Broadleaf forests	Clean water, carbon sequestration and avoided emissions, enhanced climate resilience, non-wood forest products, nature-based tourism, cultural benefits, watershed slope stabilization	Support numerous species (oak trees, laurel trees, tiger, leopard, clouded leopard, wild dog, ungulates, black bear, red panda, golden langur, hornbill, pheasant, white bellied heron, and many more); threatened due to poor grazing practices, anthropogenic and natural forest fires, fragmentation due to infrastructure, some timber and firewood extraction
5	Riverine systems	Clean water, enhanced climate resilience, nature-based tourism, cultural benefits, hydropower, fisheries	Support numerous species, including critically endangered white-bellied heron, fish, environmental flows that support natural ecosystems, riverine corridors for fishes, otters, turtles, amphibians, macroinvertebrates (crustaceans, worms, insects)
6	Glacier and glacial lake processes	Clean water, enhanced climate resilience	Unique ecosystem threatened due to climate change, water towers
7	Tiger	Nature-based tourism, cultural benefits, keystone species that controls herbivores and prey populations (e.g. wild pigs)	Represent wide range of altitudes; apex predator; require high concentrations of prey species; require sizeable ranges; umbrella species; endangered
8	Snow leopard	Cultural benefits	Represent high altitude habitats; apex predator; require high concentrations of prey species; threatened due to retaliatory killing for livestock depredation
9	Golden mahseer	Nature-based tourism	Keystone species for riverine ecosystems (representing a different elevation range than snow trout)
10	Snow trout	Nature-based tourism	Keystone species for riverine ecosystems (representing a different elevation range than golden mahseer)

Factors Affecting Ecosystem Services and Biodiversity

For decades, the government of Bhutan has stayed true to its environmental commitments. However, times are changing and new pressures are rising up. Bhutan is faced with the impacts of a changing climate, many of them with profound implications for the extremely diverse ecosystems, traditional livelihoods and cultures, and the development trajectory of the country. The following constitute the main factors expected to affect Bhutan's ecosystem services and biodiversity over the next 10 years.

Habitat loss and degradation

Pressures from a rising human population, agriculture, and livestock coupled with monetization and development of Bhutan's economy are adversely affecting forest sustainability and resilience. These activities not only lead to loss of natural habitat, but also trigger habitat fragmentation and degradation, negatively impacting biodiversity.

Causes of forest degradation include overgrazing, anthropogenic or natural wildfires (increasing as precipitation patterns become more variable and extreme events like droughts and heat waves become more frequent and intense), and unsustainable collection of non-wood forest products. The challenge for the forestry sector is to keep up with the overall economic growth rate, maintain its share of production, provide necessary support to other sectors, and improve the economic health of people living around forests.

In addition, hydropower development is one of the key threats to aquatic biodiversity due to fragmentation of river ecosystem resulting in destruction of habitats and spawning ground and physical barriers to fish migration.

Human-wildlife conflict

For a country that has more than half of its total area within the protected area network, and at least two thirds of the populace dependent on agriculture and livestock farming, human-wildlife conflict (HWC) is becoming a growing concern. Livestock depredation and crop damage (in particular with wild pig and black bear) are two major problems caused by wildlife, posing serious threats to livelihoods. Records show that about 55 per cent of crop damage in the country is attributed to wildlife damages, while livestock losses account to more than 2035 incidences from 2002-2013[18]. Continual conflicts impact rural livelihood and quality of life and lead to agriculture land fallowing and rural-urban migration. HWC may also increase in the coming decades due to climate change, as wildlife increasingly migrate to new habitats in search of preferred climates and food sources that are also shifting, increasing contact with local communities. Communities are also likely to move in search of water sources, non-wood forest products, or other important ecosystem services that are already shifting, increasing contact with wildlife populations.

Since HWC causes substantial economic and social costs to the rural communities, it also results in retaliatory killings (for example of leopard, bear, wild pig, sambar, and barking deer), resentment against policies, and lack of support towards conservation initiatives. For example, retaliatory killing through

18 National Biodiversity Strategies and Action Plan, 2014.

poisoning of dholes few decades ago almost eliminated the species from the wild[19]. Therefore, conservation in PAs will only succeed if communities are informed, educated, and fairly compensated. Without prevention and compensation measures in place, pressures on natural resources are expected to rise, and local support for conservation is likely to decline.

Poaching and illegal logging

External actors have turned their sights have turned toward Bhutan's attractive natural riches. This has brought some serious new problems to the country. Most concerning, poachers (mostly for musk deer and bear) and illegal logging operations are entering the country's wild areas with increasing frequency, and in numbers that Bhutan's current enforcement capacity is unable to match.

Inadequate institutional capacity and resources

There are an insufficient number of skilled staff in Bhutan's protected area network. The Royal Civil Service Commission requires that each national park has a minimum of 35 staff – not enough to effectively implement and monitor activities for 51% of the area in Bhutan. The shortage of professional staff leads to major and sometimes indefinite delays implementing protected area management plan activities. In addition, many current protected area managers play both managerial and technical roles – which often overextends them, decreasing overall productivity.

Protected areas also suffer from a lack of infrastructure. For example, dispersed settlements mean that not all local communities can access park/ranger offices and outposts that provide services. Communication and information facilities – including mobility for effective and efficient day-to-day park activities – need major improvements.

Furthermore, public expenditures on environment-related programs have been decreasing in recent years[20]. Forestry services, which accounted for 40% of public environment expenditure in 2008-2009, decreased to 5% in 2012-2013. This has led to inadequate funding to support conservation activities – despite that Bhutan's protected area network is relatively young (the majority of its protected areas were created in the 1990s, with the most recent created in 2008) and therefore still requires key capacity investments to operate effectively.

Impacts of Climate Change

Bhutan is part of the Eastern Himalayas region – an area where the impacts of climate change are often more severe than anywhere else in the world. The region's glaciers have been melting at alarming rates; at least 25 of the more than 2,500 glacial lakes in Bhutan are at risk of outburst floods[21], which can have severe downstream consequences, including destroying infrastructure like dams and roads, and local communities. For example, Bhutan's Department of Geology and Mines estimates that in Bhutan's Pho chhu sub-basin, outburst floods would negatively impact over 70% of settlements in the lower valleys. Other signals of climate change include increasingly erratic rainfall patterns, including shifting wet and dry seasons; increasing frequency and intensity of extreme weather event hazards like flash floods, landslides, windstorms, fires, and drought; and occurrence of new pest and disease patterns – all of

19 HWF report, WCD, 2013.
20 Bhutan's Public Environmental Expenditure Review, 2014.
21 International Centre for Integrated Mountain Development, 2010.

which have led to declines in agricultural productivity. This ultimately leads to over-exploitation of surrounding natural resources, including expansion of agricultural lands as it becomes harder to grow on existing plots, and further increases climate vulnerability among communities.

Given how dependent Bhutan's economy is on hydropower, agriculture and forestry, the country's economic development and social well-being are thus highly vulnerable to climate change. However, currently there is a large gap in research and understanding of the exact implications of climate change for the ecosystem ecology and economy of Bhutan. There is also a lack of analysis of climate change impacts at the local level that provides useful information to develop and implement climate adaptation plans. There is an acute need in Bhutan to develop capacity and a pragmatic set of actions that can deliver on the nation's goal of remaining a carbon-neutral country and to establish systems to cope with for the adverse impacts of climate change, thereby reducing vulnerability of its natural resources and human communities, and protecting the country's overall future economic development.

Rapid demographic changes

Bhutan's population is growing steadily at about 1.6% annually and expected to double in the next four decades[22]. The current overall population of 730,000 is still low, but limited arable and habitable land could result in demographic pressures on the natural environment.

About 79% of Bhutan's population lives in rural areas, and most depend on agriculture, livestock and forestry for their livelihoods. The incidence of poverty in rural areas (16.7%) is significantly higher than that of urban areas (1.8%), and rural inhabitants must often depend on natural resources to fulfill basic needs. The absence of alternative income sources has forced rural inhabitants to engage in various types of unsustainable harvesting (of timber, forest plants and shrubs), which has resulted in exhaustive resource depletion in many rural pockets.

Another big change is the shift in age demographics. Today, more than 60% of Bhutan's population is under the age of 34, and looking for work. Since this generation is also more highly educated than ever before, they increasingly seek work as skilled labor. Fearing there will not be enough job opportunities in rural areas, many young people are leaving to find work in the nation's cities. This persistent rural-urban migration means fewer stewards of the land in the protected areas. And just as rural Bhutan is losing this critical population of conservation stewards, pressures from outside Bhutan are increasing.

Decreasing development assistance

Bhutan's 2014 Public Environmental Expenditure Review indicates that conservation in the country is heavily dependent on external donations, which have been declining in recent years. This assistance will further decrease with Bhutan's transition to middle-income status.

More troubling, as the country's funding sources decline, there is ever-rising pressure to mine and build on land in or near Bhutan's protected areas. Without any other financial solution, these options may become more attractive than conservation.

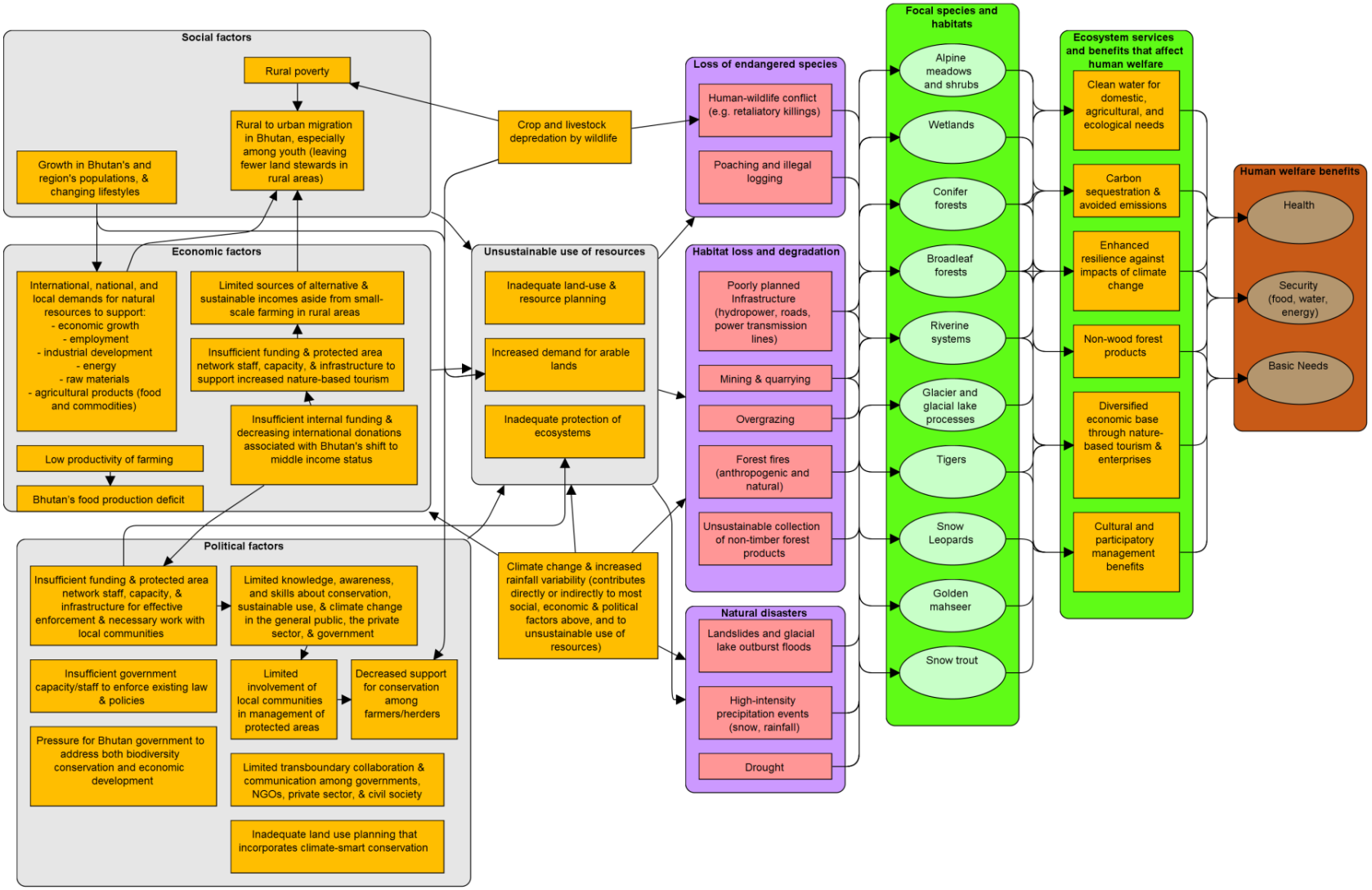
22 National Statistics Bureau, 2013.

Conceptual Model

The following diagram summarizes the situation analysis by depicting primary linkages among the main:

- Human welfare benefits that Bhutan's protected area network provides (brown ovals, far right)
- Ecosystem services the protected area network provides to people within and outside of Bhutan (orange boxes, far right)
- Focal species and habitats contained within the network (green ovals, towards right)
- Direct threats expected to affect focal species and habitats over the next 10 years (red/purple boxes in middle)
- Other factors expected to affect ecosystem services and biodiversity over the next 10 years (orange boxes at left)

Conceptual Model



Bhutan for Life Goals, Milestones and Activities

The following sections summarize how more than eighty Activities (specific time-bound actions) will contribute to the sixteen Milestones (medium and long-term objectives BFL will achieve, and a primary means to assess progress), and ultimately to four Goals (BFL's overarching outcomes). For each Goal, there is a table with relevant Milestones and Activities. (To view the theories of change in a results chain format, see Annex A. For condensed tables with all Goals, Milestones and Activities, see Annexes B and C. For Milestone indicators, see Annex E.)

Goal I: Forest and vegetative cover within the protected area network help Bhutan remain carbon neutral

Achievement of this goal starts by conducting regular biodiversity inventory surveys, and the National Forestry Inventory. These assessments will help strengthen and update land cover mapping and information management and monitoring systems to detect forest cover change, impacts of climate change, and ecological responses of forests and other systems to those impacts. BFL will take advantage of the ADVANCE partnership between WWF, Columbia University and NASA to help the country develop national climate change scenarios for various sectors, including the forestry sector.

The results from these assessments will inform the development of five-year plans for sustainable and climate-resilient forest management practices (e.g. community forest management, rural timber supplies, non-wood forest products, grazing) among communities living within the protected area network. Based on the assessments and plans, sustainable and climate-resilient forest management practices (including training local communities on natural resource management) will be implemented in the PA network. In addition, degraded land areas identified in the assessments will be field-truthed, and climate-smart[23] restoration in these implemented land areas.

This goal will also promote rural alternative energy technologies as a strategy to reduce both forest degradation and carbon emissions from firewood collection, while significantly improving quality of life for communities, especially for women living inside the protected areas. This work will begin with the prioritization of sites, and identifying and installing appropriate rural alternative energy technologies (e.g. biogas, solar) in 10% of the households within the PA network. To strengthen relations between PAS staff and local communities, the GCF project also will partially fund the training of PA network staff on community based sustainable forest management.

As a result of these activities, BFL will:

(a) Maintain forest quality and extent in 1.1 million hectares within the PA network, which will help secure the storage of the current stock of 206 million tons of carbon dioxide equivalent, and increase climate resilience through forest ecosystem conservation.
(b) Strengthen monitoring systems to detect forest cover changes, combat the climate change increased risk of forest fires, promote rural alternative energy technologies such as biogas and

23 The term "climate-smart" refers to when an action assesses and incorporates climate change risks and impacts into planning and implementation.

household solar, and implement climate smart restoration of degraded land areas within the PAs. All of these interventions will reduce deforestation risks, and hence maintain or increase the current rate of forest growth inside PAs, with these activities, over BFL's 14-year life, increasing carbon sequestration in forest within PAs by 35.1 million tons of carbon dioxide equivalent.

Milestones and Activities for Goal I:
Forest and vegetative cover within the protected area network help Bhutan remain carbon neutral

Milestone	Activity
Milestone 1: From Year 2 onwards, forest quality and extent (at 1.1 million hectares) maintained within the PA network, thereby securing the storage of 240 million tons of carbon dioxide equivalent and increasing climate resilience through forest ecosystem conservation	**Activity 1.1:** Every five years (from Year 1 onwards), conduct biodiversity inventory surveys, and every ten years (next in Year 7), conduct the National Forestry Inventory in PAs and BCs (includes strengthening and updating information management and monitoring systems to detect forest cover changes, climate change and ecological responses of forests and other systems to its impacts, and land cover mapping over time)
	Activity 1.2: From Year 2 to Year 6 (affecting 2% of the population living within PAs/BCs each year), identify priority sites for design, and implement rural alternative energies such as biogas and solar technologies for 10% of the population living within PAs/BCs
Milestone 2: By Year 4, degraded lands within the PA network are brought under climate-smart reforestation mechanisms to enhance the carbon stock (above and below ground) and increase climate resiliency	**Activity 2.1:** Every ten years (starting in Year 1), field-truth degraded land areas within the PA network
	Activity 2.2: Every year (starting in Year 4), implement climate-smart restoration in the mapped land areas
	Activity 2.3: Every five years (starting in Year 1), incorporate sustainable and climate-resilient forest management practices (community forest management, rural timber suppliers, NWFPs, grazing) into PAs/BC management plans and communities training (see milestone 13 for related activities)

Goal II: Socio-economic wellbeing of communities in and in the vicinity of the PA network enhanced by climate-informed natural resources management

Currently there is some information on ongoing impacts and future risks of climate change, but this information is at the regional Himalayan scale. Little or no information is available at the country or local scale. Moreover, what little information is available is becoming rapidly out of date as continually increasing temperatures and changing weather patterns lead to entirely unforeseen impacts. Bhutan also lacks sufficient weather stations to monitor and understand the substantial local variations over short distances. Increasing community disaster and climate resilience therefore must start with conducting community-based climate vulnerability and capacity assessments using a gender and social inclusion lens, and explicitly assessing reliance on surrounding ecosystem services. The assessments will help better understand the vulnerabilities, local responses to climate change impacts, and the capacity of local communities, especially women, poor and vulnerable groups to undertake such responses. Local knowledge will be complemented by improved local climate information through the installation of weather stations in strategic locations according to guidance from climate scientists from Columbia University and NASA as part of the ADVANCE partnership. This partnership will help develop capacity to develop climate change scenarios and forecast climate change impacts using the best available climate data and information.

With this information and the results of community based climate vulnerability and capacity assessments, climate adaptation plans will be developed for all vulnerable communities living within the protected area network. An assessment to identify and prioritize critical watersheds will also be conducted. Watershed management plans for the critical watersheds will be prepared to address identified local impacts of increasing sedimentation and flow variability, and will identify key interventions and programs, and build the capacity of local communities to execute the programs. The interventions will include activities such as revival and promotion of traditional/indigenous natural resource management systems, in conjunction with latest climate science, to build climate resilience in communities and ecosystems to identified changes; promotion of ecosystem-based adaptation for farming and grazing i.e., using nature to help communities adapt to changes impacting yields, and climate-smart organic agriculture approaches and technologies that explicitly account for the impacts of climate change identified in the above assessments and plans; improved stormwater management to address increasingly variable and extreme flows and other impacts identified in vulnerability assessments; and disaster risk reduction, preparedness and response measures to address glacial lake outburst floods and other flood and landslide risks.

The involvement of local communities in planning and decision-making regarding protected areas management will be promoted, and conservation and climate change adaptation awareness raising and education programs will be conducted to ensure that all communities living within the protected area network value, support, and engage in conservation initiatives and understand the benefits of climate resilience. Local youths will be trained and engaged as citizen scientists to enhance climate change data collection to further address information gaps, provide employment opportunities, and foster support for conservation. These activities will improve local community participation in natural resource management practices, ensure the continued flow of ecosystem goods and services, and contribute to enhancing community and ecosystem resilience to climate change.

BFL will work to provide access to nature-based employment and income-generating opportunities with special emphasis given to women, youth, poor and disadvantaged groups. This will start with developing an ecotourism strategy (updated every five years), recommending policies to promote nature-based tourism and enterprises in the protected areas, and generating buy-in from tour operators. As part of that strategy, ecotourism and nature-based business models will be created for all protected areas based on sound market assessments, projected conservation gains, climate-smart planning (developing plans that account for existing impacts and future risks of climate change, identified through the ADVANCE partnership and local vulnerability assessments), and multi-stakeholder engagement. The feasibility of joint ventures will be assessed, and guidelines for their establishment developed. Equipment and production inputs will be provided, as needed, to develop ecotourism enterprises, and build appropriate ecotourism infrastructure (e.g. trails, facilities). Commercial viability and sustainability assessments will be conducted for non-wood forest products (NWFPs) within the protected area network, and NWFP sustainable harvesting operational plans for communities (including benefit sharing) will be developed to build community resilience to climate change impacts through income and livelihoods diversification and enhancement. The capacity of local communities, with special emphasis on women, youth, poor and disadvantaged groups, will be enhanced in ecotourism services (hospitality, customer service, guides, sanitation); entrepreneurship, marketing, and financial and management skills; and sustainable harvesting, marketing and local processing of NWFPs. These activities will lead to the establishment of ten ecotourism enterprises (in partnership with the private sector and local communities), thirty nature-based local enterprises, and sustainable harvesting and local processing of commercially viable NWFPs. This will result in increased access to nature-based employment and income-generating opportunities for 80% of all households within protected areas, and will improve livelihoods, increase support for conservation, and enhance resilience to climate change by providing alternative sources of income.

Another important strategy integral to BFL is to improve the socio-economic well-being of local communities by reducing human-wildlife conflict (HWC) in and around protected areas through the adoption of appropriate policies, technologies and systems. Mitigating HWC starts with identifying HWC hotspots, causes, and the effectiveness of various interventions, using that information to update the five-year HWC Mitigation Strategy, and proposing amendments to relevant policies. The implementation of the HWC Mitigation Strategy comes next, and includes building capacity and providing equipment to community organizations, installing cost-effective and innovative mitigation mechanisms (e.g. alternative crops, habitat enrichment, biological barriers, appropriate physical barriers), and strengthening and expanding community-based crop and livestock insurance schemes. These interventions will reduce and/or compensate for HWC, decrease the losses to communities from HWC (increasing their welfare), and increase local community support for conservation activities. Ultimately, 80% of the 7,000 households within protected areas will benefit from reduced HWC due to the adoption of appropriate policies, technologies and systems.

Milestones and Activities for Goal II: Socio-economic wellbeing of communities in and in the vicinity of the PA network enhanced by climate informed natural resources management

Milestone	Activity
Milestone 3: By Year 8, all communities in PAs value, support, and engage in conservation, including waste management and climate change adaptation	**Activity 3.1:** Every year (starting in Year 2), train and mobilize youth from PA communities as citizen scientists and volunteer groups in all PAs/BCs
	Activity 3.2: Every four years (starting in Year 3), build local stewardship of park resources and mobilize communities for sustainable and climate-resilient resource management practices (community forest management, rural timber suppliers, grazing) in PAs/BCs
	Activity 3.3: Every year (starting in Year 1), conduct conservation awareness and education programs in all PAs/BCs
	Activity 3.4: Every year (starting in Year 1), involve and engage local communities with special emphasis to women, youth, poor and disadvantaged group in the planning and decision-making of PAs
	Activity 3.5: Every year (starting in Year 1), all PAs/BCs implement effective waste management programs based on existing regulation and waste management frameworks
	Activity 3.6: Every year (starting in Year 1), provide local employment opportunities to local communities with special emphasis to women, youth, poor and disadvantaged group in activities related to park management (informants, local guides, cooks, campsite managers)
Milestone 4: From Year 7 onwards, all communities living within PAs use traditional knowledge, best available science and technologies to increase their climate and disaster resilience	**Activity 4.1:** Every 10 years (starting in Year 2), conduct community-based Climate Vulnerability and Capacity Assessment (CVCA) and surveys of human responses to climate change, and develop adaptation plans for communities with special emphasis to women, youth, poor and disadvantaged group in all PAs/BCs
	Activity 4.2: From Year 2 to Year 7 (for five villages in Year 2, and six villages per year from Year 3 to Year 7), based on CVCA results, implement ecosystem-based adaptation and climate-smart, organic agriculture approaches and technologies, in priority demonstration sites in critical watersheds (representing 10% of the population living within PAs/BCs) (This relates to Activity 12.3)

Milestone	Activity
	Activity 4.3: From Year 2 to Year 7 (for five villages in Year 2, and six villages per year from Year 3 to Year 7), based on CVCA results, design and implement stormwater management, disaster risk reduction, preparedness, and response measures in priority demonstration sites in critical watersheds (representing 10% of the population living within PAs/BCs) (This relates to Activity 12.3)
	Activity 4.4: Every ten years (next in Year 2), develop, raise awareness, and build capacity to implement community-based climate adaptation plans and green recovery and reconstruction (This relates to Activity 12.3)
	Activity 4.5: Document (every four years; next in Year 1), revive where necessary and promote (every four years; next in Year 5) continued use of traditional/indigenous systems related to conservation and climate resilience
Milestone 5: By Year 4, 80% of all households within PAs benefit from reduced human wildlife conflict as a result of adoption of appropriate policies, technologies and systems	**Activity 5.1:** Every five years (next in Year 1), conduct nationwide research studies to increase understanding of the causes of human wildlife conflict (including conflicts arising from human responses to climate change) for specific PAs/BCs and the effectiveness of various interventions, and assess and map HWC hotspots
	Activity 5.2: Every five years (next in Year 1), update the Human Wildlife Conflict Mitigation Strategy and propose amendments for relevant policies
	Activity 5.3: By Year 2, implement cost-effective and innovative human wildlife conflict mitigation mechanisms such as alternative crops, rainwater harvesting, habitat enrichment, and biological barriers within PAs/BCs and buffer zones
	Activity 5.4: Build capacity for (every two years; next in Year 2) and equip (every four years; next in Year 2) Gewog Environment Conservation Committees (GECCs) to combat human wildlife conflict
	Activity 5.5: From Year 2 to Year 6, install appropriate physical barriers in human wildlife conflict hotspots within PAs/BCs and buffer zones
	Activity 5.6: Every five years (next in Year 3), strengthen and expand community-based crop and livestock insurance schemes for human wildlife conflict in PAs/BCs and buffer zones

Milestone	Activity
Milestone 6: By Year 9, 80% of all households within PAs have increased access to nature-based employment and income-generating opportunities including ecotourism and sustainable harvesting of NWFPs, enhancing their resilience to climate change	**Activity 6.1:** Every five years (next in Year 1), develop ecotourism strategy and recommend policies that promote nature-based tourism and enterprises in the PAs, and buy-in from tour operators
	Activity 6.2: By Year 2, create ecotourism and nature-based business models for all PAs based on sound market assessments, conservation gains, planning, and multi-stakeholder engagement
	Activity 6.3: From Year 4 to Year 9, implement ten ecotourism enterprises in partnership with the private sector and local communities
	Activity 6.4: From Year 4 to Year 10, design and develop eco-tourism infrastructure (treks and trails) in six PAs, and expand such infrastructure in the other four PAs
	Activity 6.5: From Year 3 to Year 7 (at the rate of six implemented per year), implement 30 nature-based local enterprises in PAs/BCs (focusing on unique selling points of individual PAs/BCs)
	Activity 6.6: From Year 1 to Year 5, build capacity of local communities with special emphasis to women, youth, poor and disadvantaged group on entrepreneurial skills, marketing, and financial management
	Activity 6.7: By Year 1, conduct commercial viability, climate-resilience, and sustainability assessment of NWFPs inside PAs/BCs
	Activity 6.8: Every five years (starting in Year 2), implement sustainable harvesting and local processing of selected commercially important NWFPs

Goal III: Maintain stable and thriving populations of key species contributing toward national and global biodiversity goals. Maintain habitat and ecosystem diversity and contiguity. Protected area network provides sustained ecosystem services for socioeconomic and ecological wellbeing.

Maintaining habitat and ecosystem diversity, as well as forest contiguity, will start with an assessment to understand the rate and extent of habitat change through fragmentation and degradation (for both terrestrial and aquatic ecosystems) due to climate change and other anthropogenic impacts. Based on this assessment and other studies, experts will designate high biodiversity habitats, degraded lands and climate refugia (habitats likely to persist in the face of increasing temperatures and changing weather patterns). The studies will also provide critical information for the revision of biological corridors (BCs) that link protected areas so as to ensure functionality under different future scenarios of climate change impacts, including changing migration patterns and shifting habitats and potential increases in human-wildlife conflict. The needs of terrestrial, riparian and aquatic biodiversity, particularly for connectivity, will be considered in these studies and in planning BCs.

Conservation practitioners need to understand the impacts of climate change on species and their habitats to develop climate-smart conservation strategies and plans. Such strategies and plans explicitly assess and incorporate climate change risks and impacts into planning and implementation activities for particular species. To increase government capacity to collect and analyze the necessary climate and natural resource information, BFL will support the installation and operation of weather monitoring equipment in all PAs and BCs in consultation with climate scientists, installation of natural resource monitoring equipment, and in collaboration with Columbia University's ADVANCE program will develop capacity to forecast climate change impacts understand potential key thresholds for biodiversity and ecosystem services and plan for likely future scenarios.

To protect species against threats from poaching and other illegal activities, protected area staff will be provided with the appropriate skills and equipment to conduct effective law enforcement. This enforcement includes SMART[24] patrolling, crime detection, anti-poaching operations, and crime scene investigation. Improved law enforcement in the protected areas will limit illegal activities, such as illegal logging and extraction of forest resources, and directly contribute to BFL goals related to mitigation and adaptation.

For the PA network to provide sustained water-related ecosystem services for socioeconomic and ecological well-being, the first step will be to conduct the necessary hydrological, climate, biological, sociocultural, and economic assessments and multi-stakeholder consultations regarding Bhutan's rivers. These assessments and consultations will evaluate freshwater species distribution, migratory paths of freshwater fish, riverine habitats, specific effects of climate change on flow patterns (variability and extremes), and social and cultural values associated with river systems. Based on this information, the RGoB will designate at least one high-conservation, economic and culturally valued stretch of river

24 SMART (Spatial Monitoring and Reporting Tool) is a suite of best practices and data collection and analysis tools that help protected area and wildlife managers better monitor, evaluate and adaptively manage patrolling activities.

linked to a protected area to be maintained as free-flowing, and will effectively manage that stretch for conservation and climate resilience through an integrated watershed management approach addressing identified impacts like increasing flow variability, erosion and sedimentation, and extremes. The government will also identify and prioritize ten watersheds within protected areas critical for drinking water and irrigation, utilizing the national river basin and climate change assessments and other tools, which focus on quality, quantity, and timing of flows. After these watersheds are identified, experts will design and evaluate protection and management mechanisms for conservation and climate change adaptation, which will then be documented in watershed management plans. The capacity of local individuals and organizations will be built so they can implement these management plans. Subsequently, a foundation for payment for ecosystem services (PES) schemes (e.g. park entry fees, water use fees) will be established in selected protected areas.

Protected area staff will also undertake habitat management activities (informed by climate information generated by the ADVANCE partnership, local climate vulnerability and capacity assessments (CVCAs), and additional studies, including those outlining adaptation options for terrestrial ecosystems) to protect wildlife. These activities will include invasive species inventory and control; restoration of grasslands and alpine meadows; restoration of riparian areas, wetlands and Ramsar Sites (waterholes, enrichment planting); and provision of training and equipment for protected area staff to work with local communities to prevent, monitor and respond to forest fires. In addition, experts will develop green and climate-smart design and construction principles for infrastructure in and around protected areas. These principles will be applied to new construction, helping to limit the impacts of infrastructure on key ecosystem services.

The RGoB will incorporate valuation of key ecosystem services provided by the protected area network, and salient climate change risks and mitigation/adaptation activities into Bhutan's National Five Year Plans. This will start with modeling climate change scenarios and impacts on Bhutan's biodiversity, freshwater resources, and economy to put a value on key ecosystem services now and in the future, and to support scenario planning. The RGoB will incorporate findings by including relevant activities for the Ministry of Agriculture and Forests (MoAF) and other government agencies within the Five Year Plans adapted to these scenarios. Awareness and capacity of government, academia and research institutions will be built. These activities will lead to improvements in watershed conditions for the free-flowing stretch of river and the ten critical catchments, and ultimately support climate resilience, wildlife, and socioeconomic development.

Milestones and Activities for Goal III:
Maintain stable and thriving populations of key species contributing toward national and global biodiversity goals. Maintain habitat and ecosystem diversity and contiguity. Protected area network provides sustained ecosystem services for socioeconomic and ecological wellbeing.

Milestone	Activity
Milestone 7: By Year 6, populations of tigers and snow leopards, two flagship species that represent major ecosystems, are increased or stable (tigers increased by at least 20% over 2015 levels, and snow leopards stable at 2016 levels)	**Activity 7.1:** Every five years, conduct population estimates for tigers (next in Year 4) and snow leopards (next in Year 5)
	Activity 7.2: Every five years, conduct prey-based assessments for tigers (next in Year 4) and snow leopards (next in Year 5)
	Activity 7.3: Every two years (next in Year 1) for tigers and snow leopards, assess dispersal, territory, home range size, and (every ten years, next in Year 1) climate vulnerability using habitat modeling, and assess viable populations in relation to area and prey
	Activity 7.4: Every five years, develop climate-smart species conservation plans (including the human responses to climate change that impact these species) for tigers (next in Year 5) and snow leopards (next in Year 1)
Milestone 8: By Year 6, information on the conservation status of 10 other high-profile, lesser known, endangered or endemic flora and fauna species established, and five climate-smart species conservation plans developed (in addition to those for tigers and snow leopards)	**Activity 8.1:** From Year 1 to Year 5 (at the rate of two surveys per year), design and conduct surveys for ten other high-profile, lesser known, endangered or endemic flora and fauna species, groups, or families of species (including at least one aquatic species)
	Activity 8.2: From Year 2 to Year 5, document and list conservation status of ten other high-profile, lesser known, endangered or endemic flora and fauna species (including at least one aquatic species), and update species list
	Activity 8.3: From Year 2 to Year 7, develop climate-smart species conservation plans for five other high-profile, lesser known, endangered or endemic flora and fauna species

Milestone	Activity
Milestone 9: By Year 2, Zero Poaching Framework and SMART/effective patrolling instituted in all PAs/BCs to prevent, combat, and monitor poaching, wildlife trade, and other illegal activities	**Activity 9.1:** Every two years (next in Year 2), build capacity of enforcement agencies including customs, postal, police, and Green Bench under the judiciary system
	Activity 9.2: Every year (starting in Year 2), implement inter-agency cooperation mechanism across enforcement and partner agencies
	Activity 9.3: Every year (starting in Year 3), strengthen and expand informant network and communication systems
	Activity 9.4: Every year (starting in Year 1), strengthen bilateral cooperation and information-sharing to combat transboundary and regional wildlife trade
	Activity 9.5: By Year 2, develop Zero Poaching Framework for Bhutan (and update every 5 years)
	Activity 9.6: Train (every two years, starting in Year 3) and equip (every five years, next in Year 4) park staff on detection, effective anti-poaching operations, and crime scene investigation
	Activity 9.7: Every year (starting in Year 1), implement SMART patrolling in all PAs/BCs
	Activity 9.8: In Year 1, conduct technology feasibility assessment, and each year (starting in Year 2) ensure appropriate technology to combat poaching and other illegal activities in PAs is in place
Milestone 10: By Year 6, key high-biodiversity and climate resilience value habitats (and areas that connect them) are under improved management	**Activity 10.1:** By Year 2, conduct nationwide mapping and analysis, and designate high biodiversity habitats, degraded lands, and climate refugia
	Activity 10.2: By Year 3, conduct functionality studies of BCs (including their future feasibility under climate change) and delineate them
	Activity 10.3: Every three years (starting in Year 1), conduct inventory of invasive species in PAs/BCs, and every year (starting in Year 2) control their spread
	Activity 10.4: Every three years (starting in Year 3), track the rate and extent of habitat loss from habitat fragmentation and degradation due to climate change and other anthropogenic causes
	Activity 10.5: Every two years, based on climate change impacts information, implement restoration to enhance quality and resilience of lowland grasslands (next in Year 2) and alpine meadows (next in Year 1)

Milestone	Activity
	Activity 10.6: Every year (starting in Year 1), manage salt licks, snags and waterholes, and manage and enhance climate-resilience of wetlands and Ramsar Sites, including enrichment planting (using climate information wherever relevant)
	Activity 10.7: Every year for smaller rivers (starting in Year 1), and every five years for big rivers (starting in Year 1), manage river banks, riparian areas and floodplains, including limiting encroachment into these critical habitats, to reduce climate change impacts and provide habitat for wildlife and limit impacts on human well-being and infrastructure
	Activity 10.8: Conduct training every two years (starting in Year 1), and provide equipment every five years (starting in Year 1) to monitor and respond to forest fires
	Activity 10.9: By Year 1, develop green and climate-resilient design and construction principles (e.g. those that respond to increasing extreme hazards such as floods and extreme storms), and every 3 years (starting in Year 2), apply them to all infrastructure in and around PAs
Milestone 11: By Year 6, at least one high conservation, economically and culturally valued stretch of river linked to a PA is designated as free-flowing and effectively managed to continue to provide important ecosystem services for conservation and climate-resilience of local communities	**Activity 11.1:** By Year 2, conduct necessary hydrological, biological, sociocultural, and economic assessments (considering freshwater species distributions, migratory paths of freshwater fish, riverine habitats, climate change impacts, and social and cultural values associated with river systems)
	Activity 11.2: By Year 3, conduct multi-stakeholder consultations within the catchment of the proposed free-flowing river
	Activity 11.3: By Year 5, evaluate and identify protection and management mechanisms for the free-flowing river that will provide the greatest conservation and community climate resilience benefits
	Activity 11.4: Every 3 years (starting in Year 5), build capacity of individuals and organizations who will be implementing management mechanisms for the free-flowing river
	Activity 11.5: Every year (starting in Year 6), implement protection and management mechanisms for the free-flowing river (including stakeholder consultations) to reduce climate change impacts and increase ecological and downstream community resilience.

Milestone	Activity
Milestone 12: By Year 7, watershed conditions in ten critical catchments within the protected area network improved for climate resilience, wildlife and socio-economic development	**Activity 12.1:** By Year 3, identify and prioritize ten critical watersheds within PAs for drinking water and irrigation using the national river basin and climate change assessments, and other tools (focusing on quality, quantity, and timing of flows) following the Kuri Chu approach and using the ADVANCE results and the other two basin assessments covered by the Department of Forests
	Activity 12.2: By Year 4, evaluate and identify protection and management mechanisms for ten critical watersheds that will provide the greatest conservation, socio-economic, and climate resilience benefits
	Activity 12.3: From Year 5 to Year 8 (three watersheds for each of the first three years, and one in Year 8), implement climate-smart protection and management mechanisms for ten critical watersheds (including stakeholder consultations)
	Activity 12.4: Every ten years (next in Year 2), build capacity of individuals and organizations who will be implementing climate-smart protection and management mechanisms for ten critical watersheds
	Activity 12.5: From Year 6 to Year 14, establish foundation for payment for ecosystem services (PES) schemes (e.g. park entry fees, water) in the protected areas
Milestone 13: By Year 7, National Five Year Plans and all PA management plans incorporate natural capital valuation, key ecosystem services provided by PAs/BCs, and salient climate change risks and mitigation/adaptation strategies	**Activity 13.1:** By Year 2, model climate change scenarios, and predict impacts of climate change on Bhutan's biodiversity, freshwater resources and economy
	Activity 13.2: By Year 5, conduct and update valuation of key ecosystem services and scenario planning (climate and development) in all PAs/BCs (one assessment per PA, and a single assessment across the BCs)
	Activity 13.3: In Year 6, incorporate findings of the natural capital valuation, key ecosystem services, and climate change assessments into the 13th National Five Year Plan (for 2023-2028), and into the respective PA and BC plans
	Activity 13.4: Every two years (starting in Year 6), build awareness and capacity of the government, academia, and research institutions to use the tools and findings (associated with the natural capital valuation, ecosystem services, and climate change assessments) for decision-making
	Activity 13.5: Every five years (starting in Year 6), review and propose amendments on relevant existing policies based on findings of key ecosystem services valuation

Goal IV: Organizational, institutional and resource capacity strengthened for effective management of the protected area network. Support the Government of Bhutan to develop new sources of financing for Bhutan's protected area network.

Achieving effective management of the protected area network by the government, communities and partners requires strengthening organizational, institutional and resource capacity. This starts with conducting a biodiversity inventory and socioeconomic surveys of conditions within protected areas and biological corridors every five years, and collecting climate data from new weather stations and natural resource monitoring equipment. Based on that information, and synching with Bhutan's National Five Year Plan cycle, climate-smart management plans (based on assessments of climate change impacts and risks, work with the ADVANCE partnership, and local CVCAs) for each protected area and the biological corridors will be developed. These management plans will contain detailed information about area-specific priorities and interventions that support BFL activities (including SMART patrolling, increasing conservation and climate awareness, engagement with local communities, generating local employment opportunities in the PA network, promoting traditional conservation knowledge, reforestation, habitat rehabilitation, river and watershed protection, and combatting forest fires). Protected area and biological corridor effectiveness will be evaluated using the Bhutan METT+[25] methodology every five years. Based on results of the surveys, participatory zoning and revisions will be conducted every ten years for each protected area and biological corridor. All areas will be physically demarcated, and ongoing maintenance will be provided to fix demarcation pillars.

To ensure appropriate and sufficient capacity to execute conservation activities, every five years the competency-based human resource and training needs will be identified, and the Protected Area Network Staffing Plan (Annex D) and training sessions will be updated. The necessary staff will be hired and trained in accordance with the Protected Area Network Staffing Plan. BFL will ensure that the necessary vehicles, field and office equipment are available and, maintained. BFL will also ensure that essential infrastructure (e.g. protected area, headquarters buildings, range office compounds, staff quarters, guard posts, guest houses, visitor information centers) will be constructed in accordance with an infrastructure development plan.

To ensure long-term financial sustainability of the protected area network, BFL will explore and develop new sources of income that may include payments for ecosystem services, park entry tourism fees and REDD+ payments.

25 METT+ (Management Effectiveness Tracking Tool) is a widely accepted tool to identify and analyze protected area management effectiveness that has been tailored for Bhutan.

Milestones and Activities for Goal IV:
Organizational, institutional and resource capacity strengthened for effective management of the protected area network. Support the Government of Bhutan to develop new sources of financing for Bhutan's protected area network.

Milestone	Activity
Milestone 14: By Year 2, the PA network has climate-smart management plans and a system to track management effectiveness, and by Year 6 the PA network is clearly demarcated	**Activity 14.1:** Every five years (starting in Year 2, and synching with National Five Year Plan cycles), develop climate-smart PA and BC management plans
	Activity 14.2: By Year 6, physically demarcate all PAs/BCs, and provide ongoing maintenance
	Activity 14.3: Every ten years (next in Year 1), carry out participatory zoning (including revisions) for each PA/BC
	Activity 14.4: Every two years (starting in Year 1), strengthen existing information management systems for improved data collection and standardized reporting
	Activity 14.5: Every year (next in Year 1), conduct monitoring of PA programs and activities
	Activity 14.6: Every five years (next in Year 1), evaluate PA/BC management effectiveness using Bhutan METT+ approach
	Activity 14.7: Conduct a periodic 3-year review (first in Year 3), a midterm evaluation (Year 8), and a final evaluation (Year 14) for Bhutan for Life
Milestone 15: By Year 5, PAs/BCs are equipped with adequate and competent staff, and by Year 10 all PAs/BCs are equipped with essential equipment and infrastructure	**Activity 15.1:** Every five years (starting in 2016), conduct and institute competency-based human resources needs and training needs assessments
	Activity 15.2: Every year (starting in Year 1), carry out capacity development programs based on the training needs assessment
	Activity 15.3: Every year (starting in Year 1), implement staffing plan in all PAs/BCs (and achieve full staffing in all PAs/BCs by Year 5)
	Activity 15.4: Every year (starting in Year 1), implement infrastructure plan (including maintenance) in all PAs/BCs (and achieve full infrastructure in all PAs/BCs by Year 10)
	Activity 15.5: Every year (starting in Year 1), procure vehicles and equipment (including maintenance) for all PAs/BCs (and achieve full vehicles and equipment in all PAs/BCs by Year 7)

Milestone	Activity
Milestone 16: By Year 2, feasibility assessments for new sources of sustainable financing have been completed, and by Year 8, new sources of long-term sustainable financing for Bhutan's protected area network have been developed, approved by the RGoB, implemented, and are producing funding that is flowing to the PA network	**Activity 16.1:** Development, lobbying and implementation of new sustainable financial mechanisms

Implementation

Project Finance for Permanence

Bhutan for Life's Vision, Mission and Milestones will be achieved by mobilizing – in a single agreement – all the governmental, financial and other commitments needed to develop Bhutan's network of protected areas and maintain it forever. The approach – called Project Finance for Permanence (PFP) – is based on a private sector practice of fully financing large, complex, well-defined projects through a set of rigorous plans and conditions that all main private and public sector partners agree to in advance[26].

The PFP agreement (usually a contract or memorandum of understanding) coalesces in a single closing and is comprised of several key components. The first is this BFL Conservation Plan, which details the conservation and socioeconomic outcomes of the initiative, and the indicators used to track them (see Annex E). The next component is a cost model, which contains detailed cost estimates for each Activity per year over the 14-year implementation period. A financial model compares those costs against existing baseline funding, and produces financial targets for donors and new funding generated within Bhutan to cover the financial gap. Lastly, a BFL transition fund will be established to hold BFL donor funds. This transition fund will be entirely spent down over the 14 years, and the RGoB will increase its spending – in part by creating new funding sources within Bhutan – until it fully assumes the costs of conservation.

In accordance with the PFP approach, the BFL transition fund will be launched only when (1) the total fundraising commitment target has been reached, and (2) all key legal and financial conditions necessary to secure the deal (the closing conditions) are in place. A board consisting of donors, government and other partners will oversee the transition fund and disburse funds each year, as long as pre-determined disbursement conditions (e.g. achievement of Milestones, increasing RGoB financial contributions, financial transparency, etc.) continue to be met. This ensures that all financial needs to cover Activities are committed from the start, and creates financial incentives to minimize the risk of partners not meeting their obligations throughout implementation.

Why Bhutan for Life Now?

Using this PFP approach, BFL will guarantee long-term protection of Bhutan's network of protected areas to secure human well-being and biodiversity conservation. It will also produce the following benefits:

1. Help achieve Aichi targets and objectives of United Nations Convention on Biological Diversity
2. Support Bhutan's commitment to remain carbon neutral under the United Nations Framework Convention on Climate Change
3. Help maintain the constitutional requirement of 60 percent forest cover for perpetuity

26 To date, three PFP initiatives have reached agreements and started implementation: ARPA for Life in Brazil's Amazon, Forever Costa Rica, and Canada's Great Bear Rainforest. Peru's Natural Legacy and Heritage Colombia are the other PFPs currently in development.

4. Contribute to Bhutan's Gross National Happiness philosophy by conserving Bhutan's environment
5. Demonstrate Bhutan's global leadership in balancing conservation with economic development
6. Leverage significant amounts of new funding

However, if action is not taken now to address the challenges Bhutan is facing, there is no guarantee that Bhutan's forests will remain intact. The country is at risk of losing or degrading the forests and other natural resources it has worked so hard to protect.

In addition, Bhutan is heavily dependent on external donors to support development and conservation. However, as Bhutan transitions to middle-income status, bilateral and multilateral partners will withdraw financial support, resulting in fewer financial resources for conservation.

These factors, coupled with the significant and urgent financial needs for Bhutan's protected areas, make now an opportune time for the RGoB and partners to pursue BFL. Under the visionary leadership of Bhutan's Monarchs, and with support from the RGoB, the initiative will support rural prosperity and environmental conservation priorities of the RGoB, contribute to the Wangchuck dynasty's pedigree of environmental leadership, and serve as a model for the world.

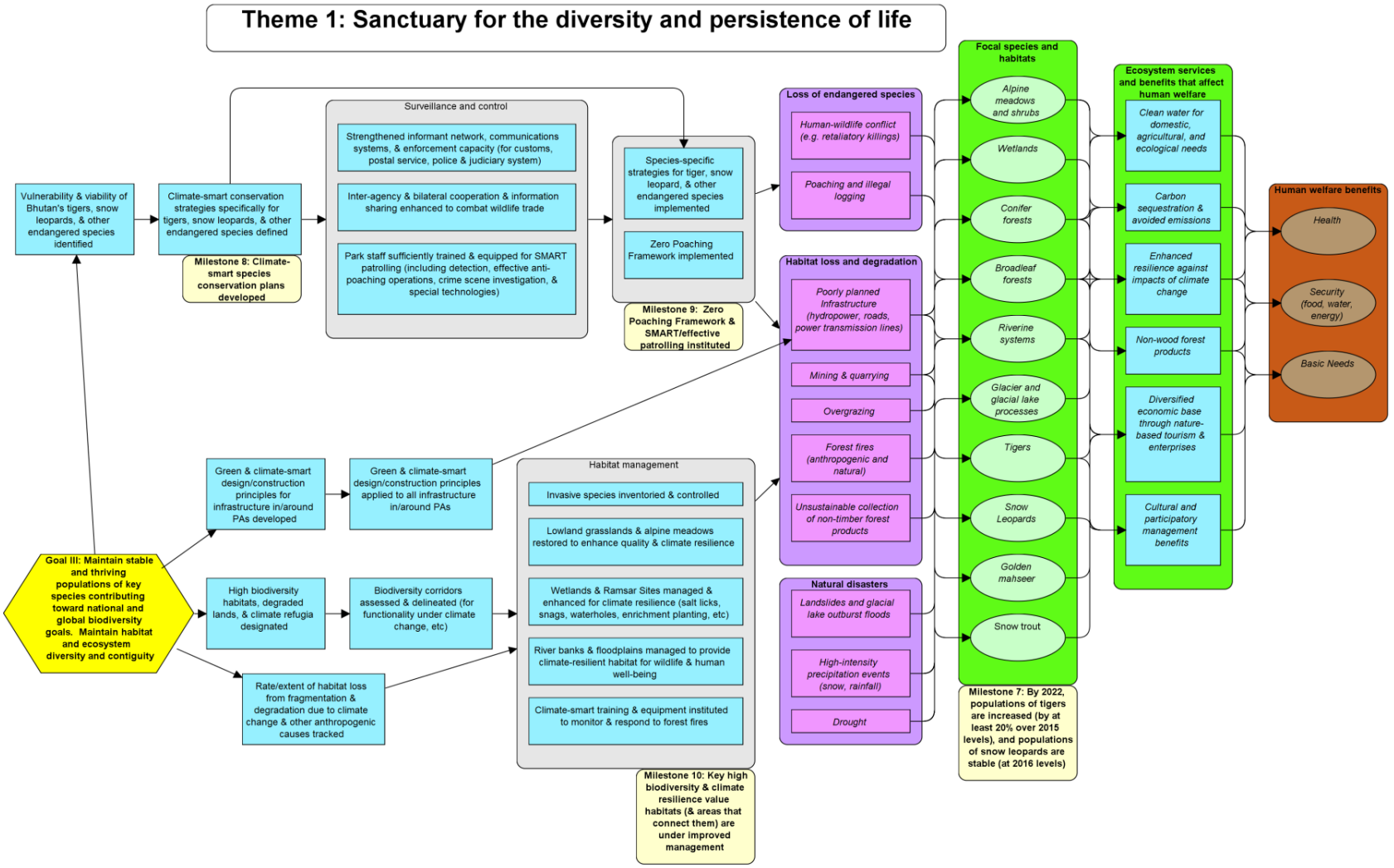
Annexes

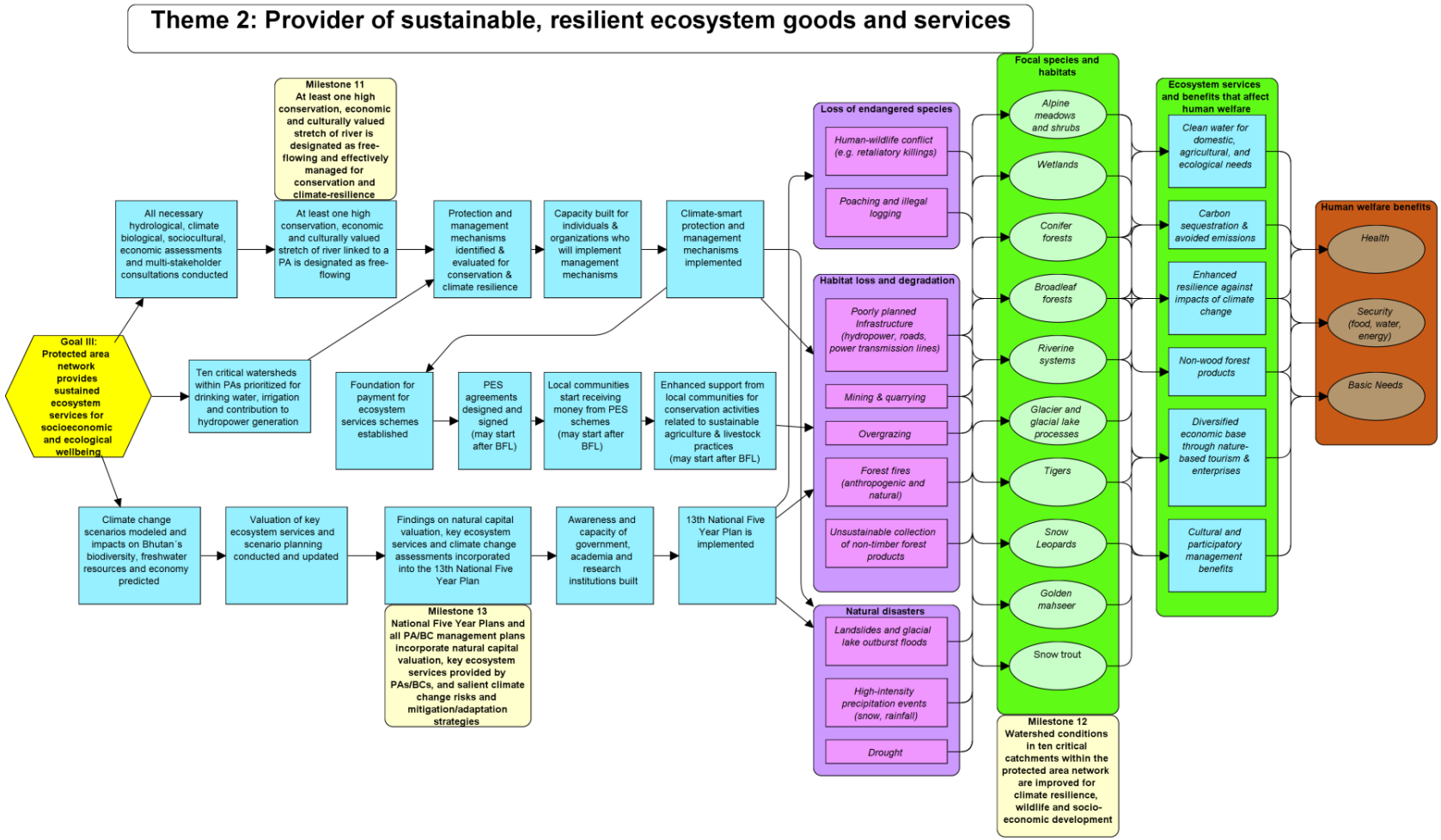
Annex A: Result Chains

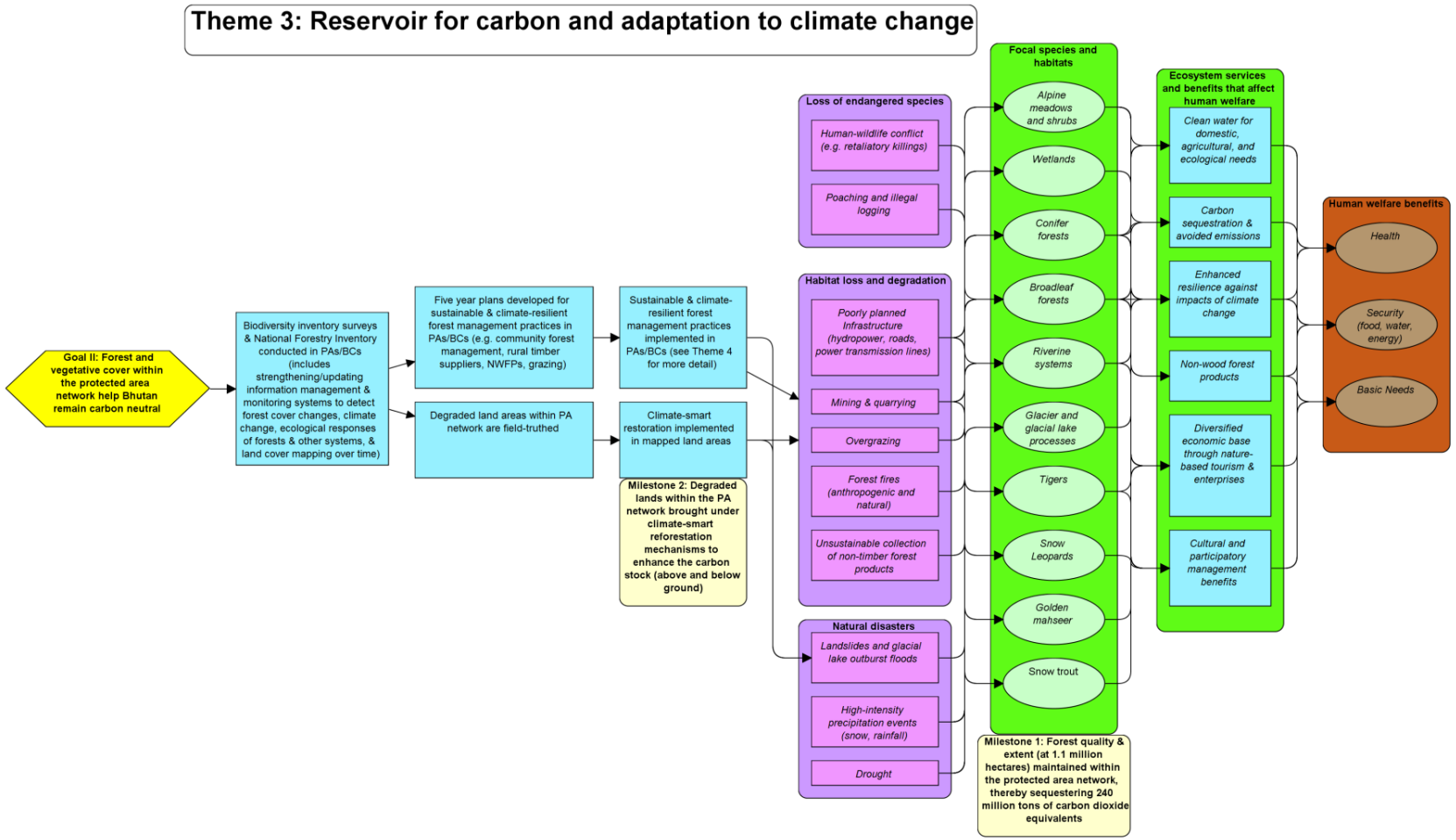
The following represent the theories of change – in results chain format – for each of Bhutan for Life's five Themes:

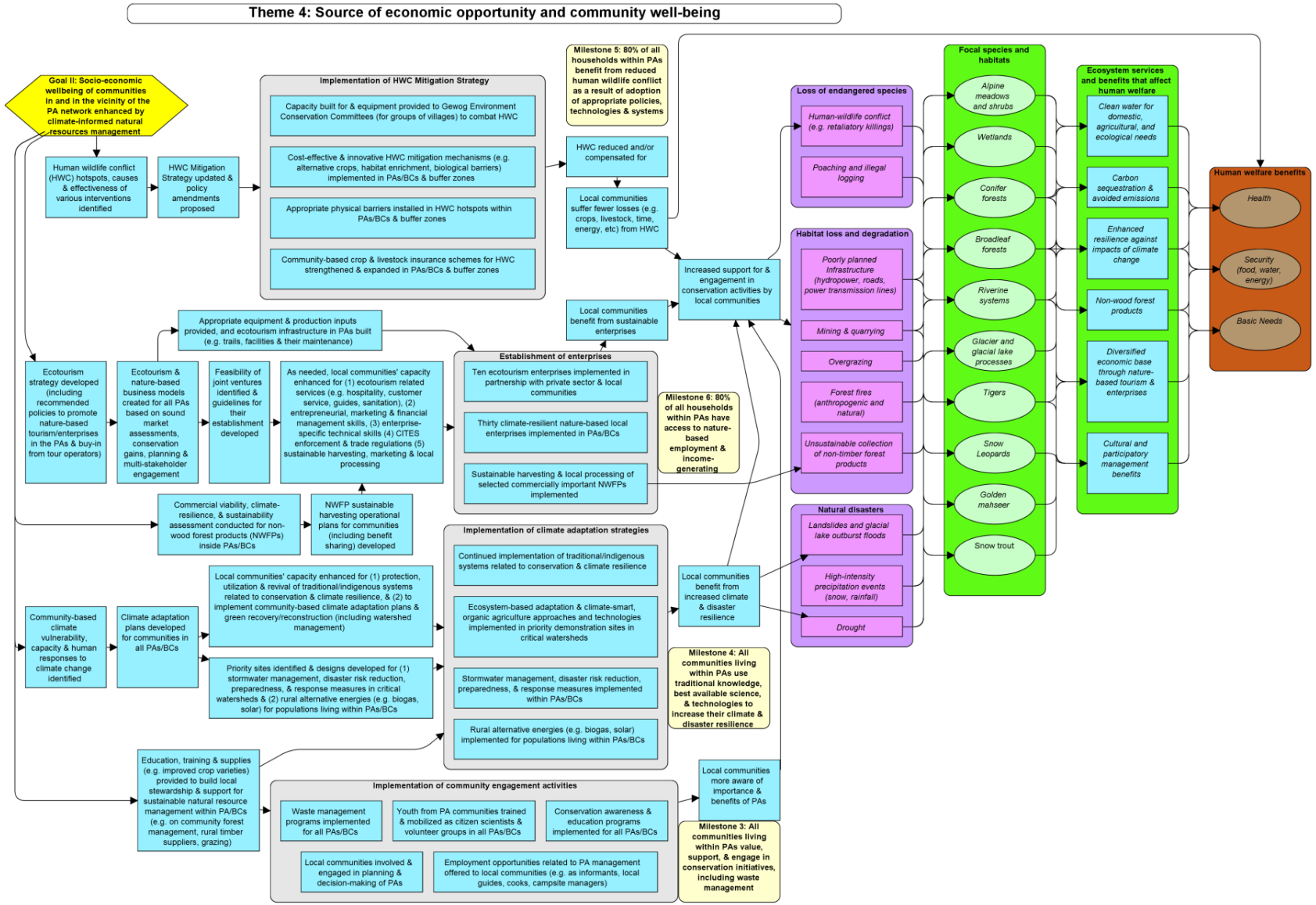
- Sanctuary for the diversity and persistence of life
- Provider of sustainable, resilient ecosystem goods and services
- Reservoir for carbon and adaptation to climate change
- Source of economic opportunity and community well-being
- Exemplar of effective management and efficient services.

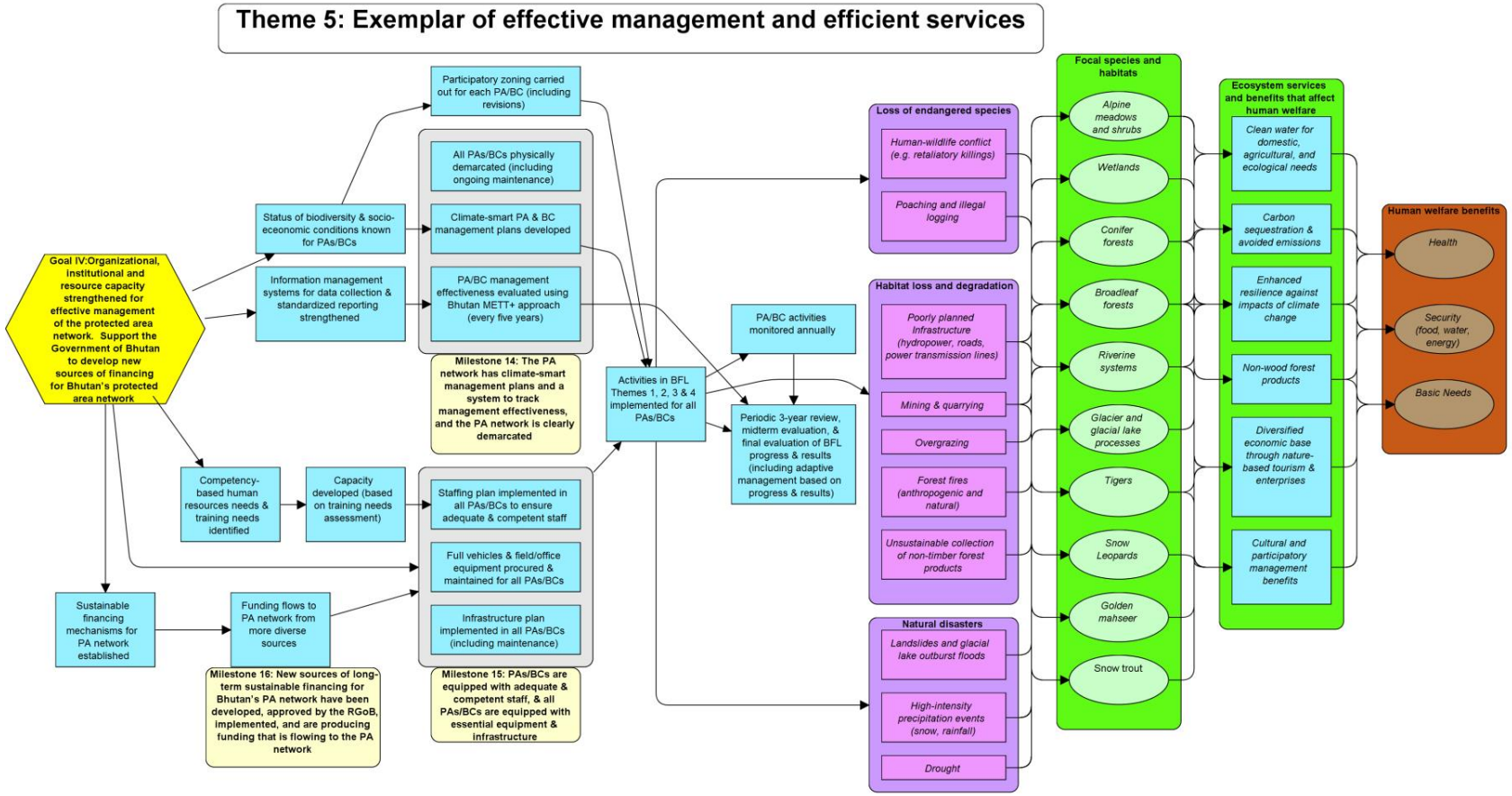
The result chain diagrams depict BFL's main results, and their links to Milestones, direct threats, focal species and habitats, ecosystem services, and human welfare benefits.


Theme 1: Sanctuary for the diversity and persistence of life
Vulnerability & viability of Bhutan's tigers, snow leopards, & other endangered species identified
Climate-smart conservation strategies specifically for tigers, snow leopards, & other endangered species defined
Milestone 8: Climate-smart species conservation plans developed
Surveillance and control
Strengthened informant network, communications systems, & enforcement capacity (for customs, postal service, police & judiciary system)
Inter-agency & bilateral cooperation & information sharing enhanced to combat wildlife trade
Park staff sufficiently trained & equipped for SMART patrolling (including detection, effective anti-poaching operations, crime scene investigation, & special technologies)
Species-specific strategies for tiger, snow leopard, & other endangered species implemented
Zero Poaching Framework implemented
Milestone 9: Zero Poaching Framework & SMART/effective patrolling instituted
Goal III: Maintain stable and thriving populations of key species contributing toward national and global biodiversity goals. Maintain habitat and ecosystem diversity and contiguity
Green & climate-smart design/construction principles for infrastructure in/around PAs developed
Green & climate-smart design/construction principles applied to all infrastructure in/around PAs
High biodiversity habitats, degraded lands, & climate refugia designated
Biodiversity corridors assessed & delineated (for functionality under climate change, etc)
Rate/extent of habitat loss from fragmentation & degradation due to climate change & other anthropogenic causes tracked
Habitat management
Invasive species inventoried & controlled
Lowland grasslands & alpine meadows restored to enhance quality & climate resilience
Wetlands & Ramsar Sites managed & enhanced for climate resilience (salt licks, snags, waterholes, enrichment planting, etc)
River banks & floodplains managed to provide climate-resilient habitat for wildlife & human well-being
Climate-smart training & equipment instituted to monitor & respond to forest fires
Milestone 10: Key high biodiversity & climate resilience value habitats (& areas that connect them) are under improved management
Loss of endangered species
Human-wildlife conflict (e.g. retaliatory killings)
Poaching and illegal logging
Habitat loss and degradation
Poorly planned infrastructure (hydropower, roads, power transmission lines)
Mining & quarrying
Overgrazing
Forest fires (anthropogenic and natural)
Unsustainable collection of non-timber forest products
Natural disasters
Landslides and glacial lake outburst floods
High-intensity precipitation events (snow, rainfall)
Drought
Focal species and habitats
Alpine meadows and shrubs
Wetlands
Conifer forests
Broadleaf forests
Riverine systems
Glacier and glacial lake processes
Tigers
Snow Leopards
Golden mahseer
Snow trout
Milestone 7: By 2022, populations of tigers are increased (by at least 20% over 2015 levels), and populations of snow leopards are stable (at 2016 levels)
Ecosystem services and benefits that affect human welfare
Clean water for domestic, agricultural, and ecological needs
Carbon sequestration & avoided emissions
Enhanced resilience against impacts of climate change
Non-wood forest products
Diversified economic base through nature-based tourism & enterprises
Cultural and participatory management benefits
Human welfare benefits
Health
Security (food, water, energy)
Basic Needs


Theme 2: Provider of sustainable, resilient ecosystem goods and services
Goal III: Protected area network provides sustained ecosystem services for socioeconomic and ecological wellbeing
All necessary hydrological, climate biological, sociocultural, economic assessments and multi-stakeholder consultations conducted
Milestone 11 At least one high conservation, economic and culturally valued stretch of river is designated as free-flowing and effectively managed for conservation and climate-resilience
At least one high conservation, economic and culturally valued stretch of river linked to a PA is designated as free-flowing
Protection and management mechanisms identified & evaluated for conservation & climate resilience
Capacity built for individuals & organizations who will implement management mechanisms
Climate-smart protection and management mechanisms implemented
Ten critical watersheds within PAs prioritized for drinking water, irrigation and contribution to hydropower generation
Foundation for payment for ecosystem services schemes established
PES agreements designed and signed (may start after BFL)
Local communities start receiving money from PES schemes (may start after BFL)
Enhanced support from local communities for conservation activities related to sustainable agriculture & livestock practices (may start after BFL)
Climate change scenarios modeled and impacts on Bhutan's biodiversity, freshwater resources and economy predicted
Valuation of key ecosystem services and scenario planning conducted and updated
Findings on natural capital valuation, key ecosystem services and climate change assessments incorporated into the 13th National Five Year Plan
Milestone 13 National Five Year Plans and all PA/BC management plans incorporate natural capital valuation, key ecosystem services provided by PAs/BCs, and salient climate change risks and mitigation/adaptation strategies
Awareness and capacity of government, academia and research institutions built
13th National Five Year Plan is implemented
Loss of endangered species
Human-wildlife conflict (e.g. retaliatory killings)
Poaching and illegal logging
Habitat loss and degradation
Poorly planned Infrastructure (hydropower, roads, power transmission lines)
Mining & quarrying
Overgrazing
Forest fires (anthropogenic and natural)
Unsustainable collection of non-timber forest products
Natural disasters
Landslides and glacial lake outburst floods
High-intensity precipitation events (snow, rainfall)
Drought
Focal species and habitats
Alpine meadows and shrubs
Wetlands
Conifer forests
Broadleaf forests
Riverine systems
Glacier and glacial lake processes
Tigers
Snow Leopards
Golden mahseer
Snow trout
Milestone 12 Watershed conditions in ten critical catchments within the protected area network are improved for climate resilience, wildlife and socio-economic development
Ecosystem services and benefits that affect human welfare
Clean water for domestic, agricultural, and ecological needs
Carbon sequestration & avoided emissions
Enhanced resilience against impacts of climate change
Non-wood forest products
Diversified economic base through nature-based tourism & enterprises
Cultural and participatory management benefits
Human welfare benefits
Health
Security (food, water, energy)
Basic Needs


Theme 3: Reservoir for carbon and adaptation to climate change
Goal II: Forest and vegetative cover within the protected area network help Bhutan remain carbon neutral
Biodiversity inventory surveys & National Forestry Inventory conducted in PAs/BCs (includes strengthening/updating information management & monitoring systems to detect forest cover changes, climate change, ecological responses of forests & other systems, & land cover mapping over time)
Five year plans developed for sustainable & climate-resilient forest management practices in PAs/BCs (e.g. community forest management, rural timber suppliers, NWFPs, grazing)
Degraded land areas within PA network are field-truthed
Sustainable & climate-resilient forest management practices implemented in PAs/BCs (see Theme 4 for more detail)
Climate-smart restoration implemented in mapped land areas
Milestone 2: Degraded lands within the PA network brought under climate-smart reforestation mechanisms to enhance the carbon stock (above and below ground)
Loss of endangered species
Human-wildlife conflict (e.g. retaliatory killings)
Poaching and illegal logging
Habitat loss and degradation
Poorly planned infrastructure (hydropower, roads, power transmission lines)
Mining & quarrying
Overgrazing
Forest fires (anthropogenic and natural)
Unsustainable collection of non-timber forest products
Natural disasters
Landslides and glacial lake outburst floods
High-intensity precipitation events (snow, rainfall)
Drought
Focal species and habitats
Alpine meadows and shrubs
Wetlands
Conifer forests
Broadleaf forests
Riverine systems
Glacier and glacial lake processes
Tigers
Snow Leopards
Golden mahseer
Snow trout
Milestone 1: Forest quality & extent (at 1.1 million hectares) maintained within the protected area network, thereby sequestering 240 million tons of carbon dioxide equivalents
Ecosystem services and benefits that affect human welfare
Clean water for domestic, agricultural, and ecological needs
Carbon sequestration & avoided emissions
Enhanced resilience against impacts of climate change
Non-wood forest products
Diversified economic base through nature-based tourism & enterprises
Cultural and participatory management benefits
Human welfare benefits
Health
Security (food, water, energy)
Basic Needs


Theme 4: Source of economic opportunity and community well-being
Goal II: Socio-economic wellbeing of communities in and in the vicinity of the PA network enhanced by climate-informed natural resources management
Human wildlife conflict (HWC) hotspots, causes & effectiveness of various interventions identified
HWC Mitigation Strategy updated & policy amendments proposed
Implementation of HWC Mitigation Strategy
Capacity built for & equipment provided to Gewog Environment Conservation Committees (for groups of villages) to combat HWC
Cost-effective & innovative HWC mitigation mechanisms (e.g. alternative crops, habitat enrichment, biological barriers) implemented in PAs/BCs & buffer zones
Appropriate physical barriers installed in HWC hotspots within PAs/BCs & buffer zones
Community-based crop & livestock insurance schemes for HWC strengthened & expanded in PAs/BCs & buffer zones
Milestone 5: 80% of all households within PAs benefit from reduced human wildlife conflict as a result of adoption of appropriate policies, technologies & systems
HWC reduced and/or compensated for
Local communities suffer fewer losses (e.g. crops, livestock, time, energy, etc) from HWC
Increased support for & engagement in conservation activities by local communities
Local communities benefit from sustainable enterprises
Appropriate equipment & production inputs provided, and ecotourism infrastructure in PAs built (e.g. trails, facilities & their maintenance)
Ecotourism strategy developed (including recommended policies to promote nature-based tourism/enterprises in the PAs & buy-in from tour operators)
Ecotourism & nature-based business models created for all PAs based on sound market assessments, conservation gains, planning & multi-stakeholder engagement
Feasibility of joint ventures identified & guidelines for their establishment developed
As needed, local communities' capacity enhanced for (1) ecotourism related services (e.g. hospitality, customer service, guides, sanitation), (2) entrepreneurial, marketing & financial management skills, (3) enterprise-specific technical skills (4) CITES enforcement & trade regulations (5) sustainable harvesting, marketing & local processing
Establishment of enterprises
Ten ecotourism enterprises implemented in partnership with private sector & local communities
Thirty climate-resilient nature-based local enterprises implemented in PAs/BCs
Sustainable harvesting & local processing of selected commercially important NWFPs implemented
Milestone 6: 80% of all households within PAs have access to nature-based employment & income-generating
Commercial viability, climate-resilience, & sustainability assessment conducted for non-wood forest products (NWFPs) inside PAs/BCs
NWFP sustainable harvesting operational plans for communities (including benefit sharing) developed
Implementation of climate adaptation strategies
Continued implementation of traditional/indigenous systems related to conservation & climate resilience
Ecosystem-based adaptation & climate-smart, organic agriculture approaches and technologies implemented in priority demonstration sites in critical watersheds
Stormwater management, disaster risk reduction, preparedness, & response measures implemented within PAs/BCs
Rural alternative energies (e.g. biogas, solar) implemented for populations living within PAs/BCs
Local communities benefit from increased climate & disaster resilience
Milestone 4: All communities living within PAs use traditional knowledge, best available science, & technologies to increase their climate & disaster resilience
Community-based climate vulnerability, capacity & human responses to climate change identified
Climate adaptation plans developed for communities in all PAs/BCs
Local communities' capacity enhanced for (1) protection, utilization & revival of traditional/indigenous systems related to conservation & climate resilience, & (2) to implement community-based climate adaptation plans & green recovery/reconstruction (including watershed management)
Priority sites identified & designs developed for (1) stormwater management, disaster risk reduction, preparedness, & response measures in critical watersheds & (2) rural alternative energies (e.g. biogas, solar) for populations living within PAs/BCs
Education, training & supplies (e.g. improved crop varieties) provided to build local stewardship & support for sustainable natural resource management within PA/BCs (e.g. on community forest management, rural timber suppliers, grazing)
Implementation of community engagement activities
Waste management programs implemented for all PAs/BCs
Youth from PA communities trained & mobilized as citizen scientists & volunteer groups in all PAs/BCs
Conservation awareness & education programs implemented for all PAs/BCs
Local communities involved & engaged in planning & decision-making of PAs
Employment opportunities related to PA management offered to local communities (e.g. as informants, local guides, cooks, campsite managers)
Local communities more aware of importance & benefits of PAs
Milestone 3: All communities living within PAs value, support, & engage in conservation initiatives, including waste management
Loss of endangered species
Human-wildlife conflict (e.g. retaliatory killings)
Poaching and illegal logging
Habitat loss and degradation
Poorly planned infrastructure (hydropower, roads, power transmission lines)
Mining & quarrying
Overgrazing
Forest fires (anthropogenic and natural)
Unsustainable collection of non-timber forest products
Natural disasters
Landslides and glacial lake outburst floods
High-intensity precipitation events (snow, rainfall)
Drought
Focal species and habitats
Alpine meadows and shrubs
Wetlands
Conifer forests
Broadleaf forests
Riverine systems
Glacier and glacial lake processes
Tigers
Snow Leopards
Golden mahseer
Snow trout
Ecosystem services and benefits that affect human welfare
Clean water for domestic, agricultural, and ecological needs
Carbon sequestration & avoided emissions
Enhanced resilience against impacts of climate change
Non-wood forest products
Diversified economic base through nature-based tourism & enterprises
Cultural and participatory management benefits
Human welfare benefits
Health
Security (food, water, energy)
Basic Needs


Theme 5: Exemplar of effective management and efficient services
Goal IV:Organizational, institutional and resource capacity strengthened for effective management of the protected area network. Support the Government of Bhutan to develop new sources of financing for Bhutan's protected area network
Participatory zoning carried out for each PA/BC (including revisions)
Status of biodiversity & socio-eceonomic conditions known for PAs/BCs
Information management systems for data collection & standardized reporting strengthened
All PAs/BCs physically demarcated (including ongoing maintenance)
Climate-smart PA & BC management plans developed
PA/BC management effectiveness evaluated using Bhutan METT+ approach (every five years)
Milestone 14: The PA network has climate-smart management plans and a system to track management effectiveness, and the PA network is clearly demarcated
Competency-based human resources needs & training needs identified
Capacity developed (based on training needs assessment)
Staffing plan implemented in all PAs/BCs to ensure adequate & competent staff
Full vehicles & field/office equipment procured & maintained for all PAs/BCs
Infrastructure plan implemented in all PAs/BCs (including maintenance)
Milestone 15: PAs/BCs are equipped with adequate & competent staff, & all PAs/BCs are equipped with essential equipment & infrastructure
Sustainable financing mechanisms for PA network established
Funding flows to PA network from more diverse sources
Milestone 16: New sources of long-term sustainable financing for Bhutan's PA network have been developed, approved by the RGoB, implemented, and are producing funding that is flowing to the PA network
Activities in BFL Themes 1, 2, 3 & 4 implemented for all PAs/BCs
PA/BC activities monitored annually
Periodic 3-year review, midterm evaluation, & final evaluation of BFL progress & results (including adaptive management based on progress & results)
Loss of endangered species
Human-wildlife conflict (e.g. retaliatory killings)
Poaching and illegal logging
Habitat loss and degradation
Poorly planned Infrastructure (hydropower, roads, power transmission lines)
Mining & quarrying
Overgrazing
Forest fires (anthropogenic and natural)
Unsustainable collection of non-timber forest products
Natural disasters
Landslides and glacial lake outburst floods
High-intensity precipitation events (snow, rainfall)
Drought
Focal species and habitats
Alpine meadows and shrubs
Wetlands
Conifer forests
Broadleaf forests
Riverine systems
Glacier and glacial lake processes
Tigers
Snow Leopards
Golden mahseer
Snow trout
Ecosystem services and benefits that affect human welfare
Clean water for domestic, agricultural, and ecological needs
Carbon sequestration & avoided emissions
Enhanced resilience against impacts of climate change
Non-wood forest products
Diversified economic base through nature-based tourism & enterprises
Cultural and participatory management benefits
Human welfare benefits
Health
Security (food, water, energy)
Basic Needs

Annex B: Single table with Bhutan for Life Goals, Milestones and Activities

Goal	Milestone	Activity
Goal I: Forest and vegetative cover within the protected area network help Bhutan remain carbon neutral	**Milestone 1:** From Year 2 onwards, forest quality and extent (at 1.1 million hectares) maintained within the PA network, thereby securing the storage of 240 million tons of carbon dioxide equivalent and increasing climate resilience through forest ecosystem conservation	**Activity 1.1:** Every five years (from Year 1 onwards), conduct biodiversity inventory surveys, and every ten years (next in Year 7), conduct the National Forestry Inventory in PAs and BCs (includes strengthening and updating information management and monitoring systems to detect forest cover changes, climate change and ecological responses of forests and other systems to its impacts, and land cover mapping over time)
		Activity 1.2: From Year 2 to Year 6 (affecting 2% of the population living within PAs/BCs each year), identify priority sites for design, and implement rural alternative energies such as biogas and solar technologies for 10% of the population living within PAs/BCs
	Milestone 2: By Year 4, degraded lands within the PA network are brought under climate-smart reforestation mechanisms to enhance the carbon stock (above and below ground) and increase climate resiliency	**Activity 2.1:** Every ten years (starting in Year 1), field-truth degraded land areas within the PA network
		Activity 2.2: Every year (starting in Year 4), implement climate-smart restoration in the mapped land areas
		Activity 2.3: Every five years (starting in Year 1), incorporate sustainable and climate-resilient forest management practices (community forest management, rural timber suppliers, NWFPs, grazing) into PAs/BC management plans and communities training (see milestone 13 for related activities)

Goal	Milestone	Activity
Goal II: Socio-economic wellbeing of communities in and in the vicinity of the PA network enhanced by climate-informed natural resources management	**Milestone 3:** By Year 8, all communities in PAs value, support, and engage in conservation, including waste management and climate change adaptation	**Activity 3.1:** Every year (starting in Year 2), train and mobilize youth from PA communities as citizen scientists and volunteer groups in all PAs/BCs
		Activity 3.2: Every four years (starting in Year 3), build local stewardship of park resources and mobilize communities for sustainable and climate-resilient resource management practices (community forest management, rural timber suppliers, grazing) in PAs/BCs
		Activity 3.3: Every year (starting in Year 1), conduct conservation awareness and education programs in all PAs/BCs
		Activity 3.4: Every year (starting in Year 1), involve and engage local communities with special emphasis to women, youth, poor and disadvantaged group in the planning and decision-making of PAs
		Activity 3.5: Every year (starting in Year 1), all PAs/BCs implement effective waste management programs based on existing regulation and waste management frameworks
		Activity 3.6: Every year (starting in Year 1), provide local employment opportunities to local communities with special emphasis to women, youth, poor and disadvantaged group in activities related to park management (informants, local guides, cooks, campsite managers)
	Milestone 4: From Year 7 onwards, all communities living within PAs use traditional knowledge, best available science and technologies to increase their climate and disaster resilience	**Activity 4.1:** Every 10 years (starting in Year 2), conduct community-based Climate Vulnerability and Capacity Assessment (CVCA) and surveys of human responses to climate change, and develop adaptation plans for communities with special emphasis to women, youth, poor and disadvantaged group in all PAs/BCs

Goal	Milestone	Activity
		Activity 4.2: From Year 2 to Year 7 (for five villages in Year 2, and six villages per year from Year 3 to Year 7), based on CVCA results, implement ecosystem-based adaptation and climate-smart, organic agriculture approaches and technologies, in priority demonstration sites in critical watersheds (representing 10% of the population living within PAs/BCs) (This relates to Activity 12.3)
		Activity 4.3: From Year 2 to Year 7 (for five villages in Year 2, and six villages per year from Year 3 to Year 7), based on CVCA results, design and implement stormwater management, disaster risk reduction, preparedness, and response measures in priority demonstration sites in critical watersheds (representing 10% of the population living within PAs/BCs) (This relates to Activity 12.3)
		Activity 4.4: Every ten years (next in Year 2), develop, raise awareness, and build capacity to implement community-based climate adaptation plans and green recovery and reconstruction (This relates to Activity 12.3)
		Activity 4.5: Document (every four years; next in Year 1), revive where necessary and promote (every four years; next in Year 5) continued use of traditional/indigenous systems related to conservation and climate resilience
	Milestone 5: By Year 4, 80% of all households within PAs benefit from reduced human wildlife conflict as a result of adoption of appropriate policies, technologies and systems	**Activity 5.1:** Every five years (next in Year 1), conduct nationwide research studies to increase understanding of the causes of human wildlife conflict (including conflicts arising from human responses to climate change) for specific PAs/BCs and the effectiveness of various interventions, and assess and map HWC hotspots
		Activity 5.2: Every five years (next in Year 1), update the Human Wildlife Conflict Mitigation Strategy and propose amendments for relevant policies
		Activity 5.3: By Year 2, implement cost-effective and innovative human wildlife conflict mitigation mechanisms such as alternative crops, rainwater harvesting, habitat enrichment, and biological barriers within PAs/BCs and buffer zones

Goal	Milestone	Activity
		Activity 5.4: Build capacity for (every two years; next in Year 2) and equip (every four years; next in Year 2) Gewog Environment Conservation Committees (GECCs) to combat human wildlife conflict
		Activity 5.5: From Year 2 to Year 6, install appropriate physical barriers in human wildlife conflict hotspots within PAs/BCs and buffer zones
		Activity 5.6: Every five years (next in Year 3), strengthen and expand community-based crop and livestock insurance schemes for human wildlife conflict in PAs/BCs and buffer zones
	Milestone 6: By Year 9, 80% of all households within PAs have increased access to nature-based employment and income-generating opportunities including ecotourism and sustainable harvesting of NWFPs, enhancing their resilience to climate change	**Activity 6.1:** Every five years (next in Year 1), develop ecotourism strategy and recommend policies that promote nature-based tourism and enterprises in the PAs, and buy-in from tour operators
		Activity 6.2: By Year 2, create ecotourism and nature-based business models for all PAs based on sound market assessments, conservation gains, planning, and multi-stakeholder engagement
		Activity 6.3: From Year 4 to Year 9, implement ten ecotourism enterprises in partnership with the private sector and local communities
		Activity 6.4: From Year 4 to Year 10, design and develop eco-tourism infrastructure (treks and trails) in six PAs, and expand such infrastructure in the other four PAs
		Activity 6.5: From Year 3 to Year 7 (at the rate of six implemented per year), implement 30 nature-based local enterprises in PAs/BCs (focusing on unique selling points of individual PAs/BCs)

Goal	Milestone	Activity
		Activity 6.6: From Year 1 to Year 5, build capacity of local communities with special emphasis to women, youth, poor and disadvantaged group on entrepreneurial skills, marketing, and financial management
		Activity 6.7: By Year 1, conduct commercial viability, climate-resilience, and sustainability assessment of NWFPs inside PAs/BCs
		Activity 6.8: Every five years (starting in Year 2), implement sustainable harvesting and local processing of selected commercially important NWFPs
Goal III: Maintain stable and thriving populations of key species contributing toward national and global biodiversity goals. Maintain habitat and ecosystem diversity and contiguity. Protected area network provides sustained ecosystem services for socioeconomic and ecological wellbeing.	**Milestone 7:** By Year 6, populations of tigers and snow leopards, two flagship species that represent major ecosystems, are increased or stable (tigers increased by at least 20% over 2015 levels, and snow leopards stable at 2016 levels)	**Activity 7.1:** Every five years, conduct population estimates for tigers (next in Year 4) and snow leopards (next in Year 5)
		Activity 7.2: Every five years, conduct prey-based assessments for tigers (next in Year 4) and snow leopards (next in Year 5)
		Activity 7.3: Every two years (next in Year 1) for tigers and snow leopards, assess dispersal, territory, home range size, and (every ten years, next in Year 1) climate vulnerability using habitat modeling, and assess viable populations in relation to area and prey

Goal	Milestone	Activity
		Activity 7.4: Every five years, develop climate-smart species conservation plans (including the human responses to climate change that impact these species) for tigers (next in Year 5) and snow leopards (next in Year 1)
	Milestone 8: By Year 6, information on the conservation status of 10 other high-profile, lesser known, endangered or endemic flora and fauna species established, and five climate-smart species conservation plans developed (in addition to those for tigers and snow leopards)	**Activity 8.1:** From Year 1 to Year 5 (at the rate of two surveys per year), design and conduct surveys for ten other high-profile, lesser known, endangered or endemic flora and fauna species, groups, or families of species (including at least one aquatic species)
		Activity 8.2: From Year 2 to Year 5, document and list conservation status of ten other high-profile, lesser known, endangered or endemic flora and fauna species (including at least one aquatic species), and update species list
		Activity 8.3: From Year 2 to Year 7, develop climate-smart species conservation plans for five other high-profile, lesser known, endangered or endemic flora and fauna species
	Milestone 9: By Year 2, Zero Poaching Framework and SMART/effective patrolling instituted in all PAs/BCs to prevent, combat, and monitor poaching, wildlife trade, and other illegal activities	**Activity 9.1:** Every two years (next in Year 2), build capacity of enforcement agencies including customs, postal, police, and Green Bench under the judiciary system
		Activity 9.2: Every year (starting in Year 2), implement inter-agency cooperation mechanism across enforcement and partner agencies
		Activity 9.3: Every year (starting in Year 3), strengthen and expand informant network and communication systems
		Activity 9.4: Every year (starting in Year 1), strengthen bilateral cooperation and information-sharing to combat transboundary and regional wildlife trade
		Activity 9.5: By Year 2, develop Zero Poaching Framework for Bhutan (and update every 5 years)

Goal	Milestone	Activity
		Activity 9.6: Train (every two years, starting in Year 3) and equip (every five years, next in Year 4) park staff on detection, effective anti-poaching operations, and crime scene investigation
		Activity 9.7: Every year (starting in Year 1), implement SMART patrolling in all PAs/BCs
		Activity 9.8: In Year 1, conduct technology feasibility assessment, and each year (starting in Year 2) ensure appropriate technology to combat poaching and other illegal activities in PAs is in place
	Milestone 10: By Year 6, key high-biodiversity and climate resilience value habitats (and areas that connect them) are under improved management	**Activity 10.1:** By Year 2, conduct nationwide mapping and analysis, and designate high biodiversity habitats, degraded lands, and climate refugia
		Activity 10.2: By Year 3, conduct functionality studies of BCs (including their future feasibility under climate change) and delineate them
		Activity 10.3: Every three years (starting in Year 1), conduct inventory of invasive species in PAs/BCs, and every year (starting in Year 2) control their spread
		Activity 10.4: Every three years (starting in Year 3), track the rate and extent of habitat loss from habitat fragmentation and degradation due to climate change and other anthropogenic causes
		Activity 10.5: Every two years, based on climate change impacts information, implement restoration to enhance quality and resilience of lowland grasslands (next in Year 2) and alpine meadows (next in Year 1)
		Activity 10.6: Every year (starting in Year 1), manage salt licks, snags and waterholes, and manage and enhance climate-resilience of wetlands and Ramsar Sites, including enrichment planting (using climate information wherever relevant)

Goal	Milestone	Activity
		Activity 10.7: Every year for smaller rivers (starting in Year 1), and every five years for big rivers (starting in Year 1), manage river banks, riparian areas and floodplains, including limiting encroachment into these critical habitats, to reduce climate change impacts and provide habitat for wildlife and limit impacts on human well-being and infrastructure
		Activity 10.8: Conduct training every two years (starting in Year 1), and provide equipment every five years (starting in Year 1) to monitor and respond to forest fires
		Activity 10.9: By Year 1, develop green and climate-resilient design and construction principles (e.g. those that respond to increasing extreme hazards such as floods and extreme storms), and every 3 years (starting in Year 2), apply them to all infrastructure in and around PAs
	Milestone 11: By Year 6, at least one high conservation, economically and culturally valued stretch of river linked to a PA is designated as free-flowing and effectively managed to continue to provide important ecosystem services for conservation and climate-resilience of local communities	**Activity 11.1:** By Year 2, conduct necessary hydrological, biological, sociocultural, and economic assessments (considering freshwater species distributions, migratory paths of freshwater fish, riverine habitats, climate change impacts, and social and cultural values associated with river systems)
		Activity 11.2: By Year 3, conduct multi-stakeholder consultations within the catchment of the proposed free-flowing river
		Activity 11.3: By Year 5, evaluate and identify protection and management mechanisms for the free-flowing river that will provide the greatest conservation and community climate resilience benefits
		Activity 11.4: Every 3 years (starting in Year 5), build capacity of individuals and organizations who will be implementing management mechanisms for the free-flowing river

Goal	Milestone	Activity
		Activity 11.5: Every year (starting in Year 6), implement protection and management mechanisms for the free-flowing river (including stakeholder consultations) to reduce climate change impacts and increase ecological and downstream community resilience.
	Milestone 12: By Year 7, watershed conditions in ten critical catchments within the protected area network improved for climate resilience, wildlife and socio-economic development	**Activity 12.1:** By Year 3, identify and prioritize ten critical watersheds within PAs for drinking water and irrigation using the national river basin and climate change assessments, and other tools (focusing on quality, quantity, and timing of flows) following the Kuri Chu approach and using the ADVANCE results and the other two basin assessments covered by the Department of Forests
		Activity 12.2: By Year 4, evaluate and identify protection and management mechanisms for ten critical watersheds that will provide the greatest conservation, socio-economic, and climate resilience benefits
		Activity 12.3: From Year 5 to Year 8 (three watersheds for each of the first three years, and one in Year 8), implement climate-smart protection and management mechanisms for ten critical watersheds (including stakeholder consultations)
		Activity 12.4: Every ten years (next in Year 2), build capacity of individuals and organizations who will be implementing climate-smart protection and management mechanisms for ten critical watersheds
		Activity 12.5: From Year 6 to Year 14, establish foundation for payment for ecosystem services (PES) schemes (e.g. park entry fees, water) in the protected areas
	Milestone 13: By Year 7, National Five Year Plans and all PA management plans incorporate natural capital valuation, key ecosystem services provided by PAs/BCs, and salient climate change risks and mitigation/adaptation strategies	**Activity 13.1:** By Year 2, model climate change scenarios, and predict impacts of climate change on Bhutan's biodiversity, freshwater resources and economy

Goal	Milestone	Activity
		Activity 13.2: By Year 5, conduct and update valuation of key ecosystem services and scenario planning (climate and development) in all PAs/BCs (one assessment per PA, and a single assessment across the BCs)
		Activity 13.3: In Year 6, incorporate findings of the natural capital valuation, key ecosystem services, and climate change assessments into the 13th National Five Year Plan (for 2023-2028), and into the respective PA and BC plans
		Activity 13.4: Every two years (starting in Year 6), build awareness and capacity of the government, academia, and research institutions to use the tools and findings (associated with the natural capital valuation, ecosystem services, and climate change assessments) for decision-making
		Activity 13.5: Every five years (starting in Year 6), review and propose amendments on relevant existing policies based on findings of key ecosystem services valuation
Goal IV: Organizational, institutional and resource capacity strengthened for effective management of the protected area network. Support the Government of Bhutan to develop new sources of financing for Bhutan's protected area network.	**Milestone 14:** By Year 2, the PA network has climate-smart management plans and a system to track management effectiveness, and by Year 6 the PA network is clearly demarcated	**Activity 14.1:** Every five years (starting in Year 2, and synching with National Five Year Plan cycles), develop climate-smart PA and BC management plans
		Activity 14.2: By Year 6, physically demarcate all PAs/BCs, and provide ongoing maintenance
		Activity 14.3: Every ten years (next in Year 1), carry out participatory zoning (including revisions) for each PA/BC

Goal	Milestone	Activity
		Activity 14.4: Every two years (starting in Year 1), strengthen existing information management systems for improved data collection and standardized reporting
		Activity 14.5: Every year (next in Year 1), conduct monitoring of PA programs and activities
		Activity 14.6: Every five years (next in Year 1), evaluate PA/BC management effectiveness using Bhutan METT+ approach
		Activity 14.7: Conduct a periodic 3-year review (first in Year 3), a midterm evaluation (Year 8), and a final evaluation (Year 14) for Bhutan for Life
	Milestone 15: By Year 5, PAs/BCs are equipped with adequate and competent staff, and by Year 10 all PAs/BCs are equipped with essential equipment and infrastructure	**Activity 15.1:** Every five years (starting in 2016), conduct and institute competency-based human resources needs and training needs assessments
		Activity 15.2: Every year (starting in Year 1), carry out capacity development programs based on the training needs assessment
		Activity 15.3: Every year (starting in Year 1), implement staffing plan in all PAs/BCs (and achieve full staffing in all PAs/BCs by Year 5)
		Activity 15.4: Every year (starting in Year 1), implement infrastructure plan (including maintenance) in all PAs/BCs (and achieve full infrastructure in all PAs/BCs by Year 10)
		Activity 15.5: Every year (starting in Year 1), procure vehicles and equipment (including maintenance) for all PAs/BCs (and achieve full vehicles and equipment in all PAs/BCs by Year 7)

Goal	Milestone	Activity
	Milestone 16: By Year 2, feasibility assessments for new sources of sustainable financing have been completed, and by Year 8, new sources of long-term sustainable financing for Bhutan's protected area network have been developed, approved by the RGoB, implemented, and are producing funding that is flowing to the PA network	**Activity 16.1:** Development, lobbying and implementation of new sustainable financial mechanisms

Annex C: Single table with Bhutan for Life Goals and Milestones (without Activities)

Goal	Milestone
Goal I: Forest and vegetative cover within the protected area network help Bhutan remain carbon neutral	**Milestone 1:** From Year 2 onwards, forest quality and extent (at 1.1 million hectares) maintained within the PA network, thereby securing the storage of 240 million tons of carbon dioxide equivalent and increasing climate resilience through forest ecosystem conservation
	Milestone 2: By Year 4, degraded lands within the PA network are brought under climate-smart reforestation mechanisms to enhance the carbon stock (above and below ground) and increase climate resiliency
Goal II: Socio-economic wellbeing of communities in and in the vicinity of the PA network enhanced by climate-informed natural resources management	**Milestone 3:** By Year 8, all communities in PAs value, support, and engage in conservation, including waste management and climate change adaptation
	Milestone 4: From Year 7 onwards, all communities living within PAs use traditional knowledge, best available science and technologies to increase their climate and disaster resilience
	Milestone 5: By Year 4, 80% of all households within PAs benefit from reduced human wildlife conflict as a result of adoption of appropriate policies, technologies and systems
	Milestone 6: By Year 9, 80% of all households within PAs have increased access to nature-based employment and income-generating opportunities including ecotourism and sustainable harvesting of NWFPs, enhancing their resilience to climate change
Goal III: Maintain stable and thriving populations of key species contributing toward national and global biodiversity goals. Maintain habitat and ecosystem diversity and contiguity. Protected area network provides sustained ecosystem services for socioeconomic and ecological wellbeing.	**Milestone 7:** By Year 6, populations of tigers and snow leopards, two flagship species that represent major ecosystems, are increased or stable (tigers increased by at least 20% over 2015 levels, and snow leopards stable at 2016 levels)
	Milestone 8: By Year 6, information on the conservation status of 10 other high-profile, lesser known, endangered or endemic flora and fauna species established, and five climate-smart species conservation plans developed (in addition to those for tigers and snow leopards)

Goal	Milestone
	Milestone 9: By Year 2, Zero Poaching Framework and SMART/effective patrolling instituted in all PAs/BCs to prevent, combat, and monitor poaching, wildlife trade, and other illegal activities
	Milestone 10: By Year 6, key high-biodiversity and climate resilience value habitats (and areas that connect them) are under improved management
	Milestone 11: By Year 6, at least one high conservation, economically and culturally valued stretch of river linked to a PA is designated as free-flowing and effectively managed to continue to provide important ecosystem services for conservation and climate-resilience of local communities
	Milestone 12: By Year 7, watershed conditions in ten critical catchments within the protected area network improved for climate resilience, wildlife and socio-economic development
	Milestone 13: By Year 7, National Five Year Plans and all PA management plans incorporate natural capital valuation, key ecosystem services provided by PAs/BCs, and salient climate change risks and mitigation/adaptation strategies
Goal IV: Organizational, institutional and resource capacity strengthened for effective management of the protected area network. Support the Government of Bhutan to develop new sources of financing for Bhutan's protected area network.	**Milestone 14:** By Year 2, the PA network has climate-smart management plans and a system to track management effectiveness, and by Year 6 the PA network is clearly demarcated
	Milestone 15: By Year 5, PAs/BCs are equipped with adequate and competent staff, and by Year 10 all PAs/BCs are equipped with essential equipment and infrastructure
	Milestone 16: By Year 2, feasibility assessments for new sources of sustainable financing have been completed, and by Year 8, new sources of long-term sustainable financing for Bhutan's protected area network have been developed, approved by the RGoB, implemented, and are producing funding that is flowing to the PA network

Annex D: Protected Area Network Staffing Plan (BFL Milestone 15)

The following chart contains the necessary full-time professional and supervisory, support and operational staff per year for each protected area, the biological corridors, the Royal Botanical Park, and central management of Bhutan's protected area network over BFL's 14 years.

Managing Entity & Staff Level	Existing (as of April 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Bumdeling Wildlife Sanctuary															
Level 1 – Professional and Senior Supervisory	6	6	7	7	8	9	9	9	9	9	9	9	9	9	9
Level 2 - Support	30	30	30	31	34	37	37	37	37	37	37	37	37	37	37
Level 3 - Operational	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4
Jigme Dorji National Park															
Level 1 - Professional and Senior Supervisory	12	12	13	14	15	16	16	16	16	16	16	16	16	16	16
Level 2 - Support	60	60	64	71	78	86	86	86	86	86	86	86	86	86	86
Level 3 - Operational	9	9	11	11	11	11	11	11	11	11	11	11	11	11	11
Jigme Singye Wangchuck National Park															
Level 1 - Professional and Senior Supervisory	9	9	11	13	15	16	16	16	16	16	16	16	16	16	16
Level 2 - Support	28	28	28	29	30	31	31	31	31	31	31	31	31	31	31
Level 3 - Operational	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Jomotsangkha Wildlife Sanctuary															
Level 1 - Professional and Senior Supervisory	2	2	3	5	7	8	8	8	8	8	8	8	8	8	8

Managing Entity & Staff Level	Existing (as of April 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Level 2 - Support	12	12	14	16	19	23	23	23	23	23	23	23	23	23	23
Level 3 - Operational	6	6	8	9	10	10	10	10	10	10	10	10	10	10	10
Phibsoo Wildlife Sanctuary															
Level 1 - Professional and Senior Supervisory	4	4	4	5	6	8	8	8	8	8	8	8	8	8	8
Level 2 - Support	15	15	17	20	22	25	25	25	25	25	25	25	25	25	25
Level 3 - Operational	9	9	9	9	9	10	10	10	10	10	10	10	10	10	10
Royal Manas National Park															
Level 1 - Professional and Senior Supervisory	10	10	10	12	14	16	16	16	16	16	16	16	16	16	16
Level 2 - Support	49	49	51	53	55	57	57	57	57	57	57	57	57	57	57
Level 3 - Operational	36	36	36	37	38	38	38	38	38	38	38	38	38	38	38
Sakteng Wildlife Sanctuary															
Level 1 - Professional and Senior Supervisory	9	9	11	12	13	15	15	15	15	15	15	15	15	15	15
Level 2 - Support	21	21	25	31	35	39	39	39	39	39	39	39	39	39	39
Level 3 - Operational	7	7	8	11	14	16	16	16	16	16	16	16	16	16	16
PhrumsenglaNational Park															
Level 1 - Professional and Senior Supervisory	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9
Level 2 - Support	25	25	26	27	27	29	29	29	29	29	29	29	29	29	29
Level 3 - Operational	4	4	4	5	5	6	6	6	6	6	6	6	6	6	6

Managing Entity & Staff Level	Existing (as of April 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Jigme Khesar Strict Nature Reserve															
Level 1 - Professional and Senior Supervisory	5	5	6	7	8	9	9	9	9	9	9	9	9	9	9
Level 2 - Support	16	16	17	17	17	17	17	17	17	17	17	17	17	17	17
Level 3 - Operational	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4
Wangchuck Centennial Park															
Level 1 - Professional and Senior Supervisory	10	10	11	13	15	17	17	17	17	17	17	17	17	17	17
Level 2 - Support	19	19	21	23	25	27	27	27	27	27	27	27	27	27	27
Level 3 - Operational	5	5	7	9	12	13	13	13	13	13	13	13	13	13	13
Royal Botanical Park															
Level 1 - Professional and Senior Supervisory	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3
Level 2 - Support	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10
Level 3 - Operational	3	3	4	5	6	7	7	7	7	7	7	7	7	7	7
Biological Corridors															
Level 1 - Professional and Senior Supervisory	15	15	16	17	19	20	20	20	20	20	20	20	20	20	20
Level 2 - Support	24	24	27	30	33	36	36	36	36	36	36	36	36	36	36
Level 3 - Operational	8	8	10	12	14	16	16	16	16	16	16	16	16	16	16
Central Management (non-PA specific)															
Level 1 - Professional and Senior Supervisory	9	9	10	10	11	11	11	11	11	11	11	11	11	11	11
Level 2 - Support	5	5	6	7	8	9	9	9	9	9	9	9	9	9	9

Managing Entity & Staff Level	Existing (as of April 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Level 3 - Operational	3	3	4	5	6	7	7	7	7	7	7	7	7	7	7
TOTAL	**512**	**512**	**560**	**616**	**673**	**731**	**731**	**731**	**731**	**731**	**731**	**731**	**731**	**731**	**731**

Annex E: Indicators to track Bhutan for Life Milestones

Milestone	Indicator	Reporting Frequency	Baseline (& year)	Cumulative Target (& year)	Means of Verification
1. From Year 2 onwards, forest quality and extent (at 1.1 million hectares) maintained within the PA network, thereby sequestering 240 million tons of carbon dioxide equivalent and increasing climate resilience through forest ecosystem conservation	Tons of carbon dioxide equivalent (TCO2eq)	Every 2 years	206.2 M tons of CO_2eq (2010 estimate)	Additional 35.1 million tons of CO_2eq (Year 14, end of BFL)	Standard tier 1 and 2 REDD+ MoV. When country-wide REDD+ MRV is in place, BFL MoV will adopt it
2. By Year 4, degraded lands within the PA network are brought under climate-smart reforestation mechanisms to enhance the carbon stock (above and below ground) and increase climate resiliency	Hectares of degraded land under restoration	Every 2 years	0 hectares (2017)	3,000 hectares (Year 14, end of BFL)	Standard tier 1 and 2 REDD+ MoV. When country-wide REDD+ MRV is in place BFL MoV will adopt it
3. By Year 8, all communities in PAs value, support, and engage in conservation initiatives including waste management	# of households voluntarily involved in conservation activities (sex-disaggregated data)	Every year, starting in Year 2	X number of households (baseline TBD in Year 1)	7,500 households (Year 8)	Annual Reports
4. From Year 7 onwards, all communities living within PAs use traditional knowledge, best available science and technologies to increase their climate and disaster resilience	# of households adopting climate adaptation mechanisms (sex-disaggregated data of beneficiaries)	Every year, starting in Year 2	X number of households (baseline TBD in Year 1)	7,500 households (Year 7)	Annual Reports

5. By Year 4, 80% of all households within PAs benefit from reduced human wildlife conflict as a result of adoption of appropriate policies, technologies and systems	% of households within PAs adopting appropriate human wildlife conflict mitigation measures	Every 5 years, starting in Year 2	X% of households , i.e. X number of households (baseline TBD in Year 1)	80% of households, i.e. 6,000 households (Year 4)	Annual Reports
6. By Year 9, 80% of all households within PAs and neighboring areas have increased access to nature-based employment and income-generating opportunities including eco-tourism and sustainable harvesting of NWFPs, enhancing their resilience to climate change	# of nature-based enterprises supported	Every 2 years, starting in Year 2	0 enterprises (Year 1)	60 enterprises[27] (Year 9)	Annual Reports
7. By Year 6, populations of tigers and snow leopards-two flagship species that represent major ecosystems-are increased or stable (tigers increased by at least 20% over 2015 levels, and snow leopards stable at 2016 levels)	Population of tigers in the wild	Every 5 years, starting in 2021 (b/c tiger survey done in 2020)	103 tigers (2015)	123 tigers (Year 6)	Survey report
	Population of snow leopards in the wild	Every 5 years, starting in 2022 (b/c snow leopard survey done in 2021)	96 snow leopards (2016)	96 snow leopards (Year 6)	Survey report
8. By Year 6, information on the conservation status of 10 other high-profile, lesser known, endangered or endemic flora and fauna species established, and five climate-smart species conservation plans developed (in addition to those for tigers and snow leopards)	Number of conservation plans (in addition to those for tigers and snow leopards)	Every 5 years	0 conservation plans (Year 1)	5 conservation plans (Year 6)	Conservation plans

[27] 10 ecotourism enterprises, 30 nature-based enterprises, and 20 sustainable harvesting and local processing community initiatives for NWFPs.

9. By Year 2, Zero Poaching Framework and SMART/effective patrolling instituted in all PAs/BCs to prevent, combat, and monitor poaching, wildlife trade, and other illegal activities	Number of PAs/BCs implementing SMART patrolling	Every year	4 PAs/BCs (Year 1)	18 PAs/BCs (Year 2)	Annual reports
10. By Year 6, key high-biodiversity and climate resilience value habitats (and areas that connect them) are under improved management	Hectares of habitat under improved management	Every 10 years, starting in Year 7	X hectares (baseline TBD in Year 1 after completing assessments)	X hectares (Year 6) (target TBD in Year 1)	Reports & maps
11. By Year 6, at least one high conservation, economically and culturally valued stretch of river linked to a PA is designated as free-flowing and effectively managed to continue to provide important ecosystem services for conservation and climate-resilience of local communities	Improved or stable river basin health as measured by River Basin Health Scorecard	Every 5 years, starting in Year 1	River Basin Health Scorecard score (Year 1)	River Basin Health Scorecard score (Year 6, Year 11)	River Basin Scorecard
12. By Year 7, watershed conditions in 10 critical catchments within the protected area network improved for climate resilience, wildlife and socio-economic development	Number of watersheds with management plan	Every 2 years, starting in Year 1	0 watersheds (Year 1)	10 watersheds (by year 7)	Annual Reports
13. By Year 7, National Five Year Plans and all PA management plans incorporate natural capital valuation, key ecosystem services provided by PAs/BCs, and salient climate change risks and mitigation/adaptation strategies	Number of Plans incorporating natural capital valuation and key ecosystem services	Every 5 years, starting in Year 2	0 plans	10 PA management plans, one BC plan, one Royal Botanical Park plan, and one National Five Year Plan (by year 7)	Management plans

14. By Year 2, the PA network has climate-smart management plans and a system to track management effectiveness, and by Year 6 the PA network is clearly demarcated	Bhutan METT+ management effectiveness scores (1 for each of the 10 PAs, 1 for all BCs, and 1 for Royal Botanical Park)	Every five years, starting in Year 2	Bhutan State of Parks (2016)	Bhutan State of Parks (2030) – At least 80% cumulative score against METT+ indicators	Bhutan METT+ tracking reports from each PA
15. By Year 5, PAs/BCs are equipped with adequate and competent staff, and by Year 10, all PAs/BCs are equipped with essential equipment and infrastructure	# of competent full-time PA network staff in place	Every year, starting in Year 1	512 (April 2018)	512 (Year 1) 560 (Year 2) 616 (Year 3) 675 (Year 4) 731 (Year 5)	Annual report
16. By Year 2, feasibility assessments for new sources of sustainable financing have been completed, and by Year 8, new sources of long-term sustainable financing for Bhutan's protected area network have been developed, approved by the RGoB, implemented, and are producing funding that is flowing to the PA network	Increase Government funding level of PAS	Annually	3.4 M dollars per year (2016)[28]	4.7 M dollars per year by Year 5 5.2 M dollars per year by Year 8 5.9 M dollars per year by Year 10 7.1 M dollars per year by Year 14	Government budgets

[28] Comprised of US$ 2.9 M per year of central budget allocation plus US$ 0.5 M per year from the Bhutan Trust Fund for Environmental Conservation. These figures are all in 2017 dollars, so in years 5, 8, 10 and 14, the target values for those years will need to be adjusted for actual inflation since 2017.

Annex F: Change Log for BFL Conservation Plan

The purpose of the following table is to describe specific changes made to the BFL Conservation Plan, when they were made, and who made them – in particular if any changes are made to Milestones or Activities. Any changes should be made in accordance with guidelines laid out in the BFL Operating Manual. As necessary, corresponding changes must be made in the BFL Financial Model (and the *BFL Financial Model Change Log* – within the BFL Financial Model itself – should be updated accordingly).

#	Date of Change	Description of Change (must be specific)	Who made change
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			