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BHUTAN



National Interpretation for the Identification of High Conservation Values in Bhutan





National Interpretation for the Identification of High Conservation Values in BHUTAN

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Acronyms

BTC	Bhutan Tiger Centre
CBD	Convention on Biological Diversity
CF	Community Forests
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DFO	Divisional Forest Office
DoC	Department of Culture
DoFPS	Department of Forests and Park Services
FNCA	Forest and Nature Conservation Act
FPED	Forest Protection and Enforcement Division
FRMD	Forest Resources and Management Division
FSC	Forest Stewardship Council
HCV	High Conservation Value
HCV N	High Conservation Value Network
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LFMP	Local Forest Management Plan
MoAF	Ministry of Agriculture and Forests
MoEA	Ministry of Economic Affairs
MoHCA	Ministry of Home and Cultural Affairs
MoWHS	Ministry of Works and Human Settlement
NCD	Nature Conservation Division
NDC	Nationally Determined Contribution
NEC	National Environment Commission
NEG	National Expert Group
NFI	National Forest Inventory
NGO	Non-Government Organization
NI	National Interpretation
NLC	National Land Commission
NLUZ	National Land Use Zoning
NWFP	Non-Wood Forest Products
PA	Protected Areas
REDD	Reducing Emissions from Deforestation and forest Degradation
RSPN	Royal Society for Protection of Nature
RTE	Rare Threatened and Endangered
SFED	Social Forestry and Extension Division
UWICER	Ugyen Wangchuck Institute for Conservation and Environmental Research
WMD	Water Management Division
WWF	World Wildlife Fund



Executive Summary

Bhutan, located at the juncture of the Palearctic realm of the temperate Euro-Asia and the Indo-Malayan realm of the Indian sub-continent is blessed with rich biodiversity. Acknowledging this biological richness, the country under the visionary leadership of the Monarchs has made huge commitments to the protection of the natural environment. This has been demonstrated by declaring over half the country under the protected areas system. Further, the pledge to ensure that a minimum of 60 percent of the country's land area remains under forest cover in perpetuity is enshrined in the Constitution of the Kingdom of Bhutan. While the country embraces modern development it does not want to achieve it at the cost of its rich natural and cultural heritage. Accordingly, the government has been adopting strategies that balance conservation and development. Considering the extension of biological richness and cultural heritage beyond the protected area system, the High Conservation Value (HCV) is an approach to enable informed decision making [decision makers] on how to maintain the important cultural and natural heritage found outside the protected area system. Therefore, it has the potential to further enhance and complement the conservation and sustainable development efforts in the country.

The HCV approach promulgates six categories of conservation values incorporating environmental, social and cultural values. In so doing it provides a means to treat all conservation values – which are often treated separately or in silos of expertise – together and in a holistic way. Although the six High Conservation Value categories have global definitions, these needs to be interpreted nationally. This National Interpretation (NI), which was the product of an inclusive multi-stakeholder processes, recognises Bhutan's important cultural and natural heritage. As such, this national interpretation for Bhutan will serve as a guidance document for identifying HCVs in Bhutan, and as a tool for maintaining this heritage.

This document is presented in two parts:

Part 1 introduces the HCV approach, its key principles, scope and opportunities for application in Bhutan.

Part 2 provides the National Interpretation for each of the HCVs in addition to illustrating a few examples and case studies.

This NI document does not provide details on locally relevant management and monitoring approaches for each of the HCV categories. Rather it concludes with a chapter outlining ways forward on how the National Interpretation can be used at



various scales and by various users, and introduces the relevance of management and monitoring, so that readers are aware of this. More detailed operational guidance for identifying, managing and monitoring HCVs in Bhutan is planned for the future, as the HCV approach becomes more familiar and with case-studies on its application.

The development of the National Interpretation was overseen by WWF-Bhutan. A National Consultant led the consultation process, compiled information and drafted the National Interpretation, with support both from the HCV National Expert Group¹ (NEG) and the HCV Network. An inception workshop was hosted in November 2021, to inform national stakeholders on the HCV Approach and development of the NI. The first draft resulted from consultations with the NEG, as well as one-to-one consultations with other stakeholders and experts identified during the inception workshop and subsequent meetings.

¹ Refer to annexure 2 for the list of National Expert Group

PART 1

Introduction to HCV approach and opportunities for its application in Bhutan

1. Introduction to HCV Approach

1.1 Inception

Globally, the concept of High Conservation Value (HCV) was first introduced in 1998 by the Forest Stewardship Council (FSC), an international non-profit multi-stakeholder organization established in 1993. The organization promotes responsible management of world forests and acts as a global forest certification scheme. The purpose of its inception was to use it as a tool and framework to protect important environmental, social and cultural values within forest production landscapes, with 6 HCV categories (figure 1) and global definitions.

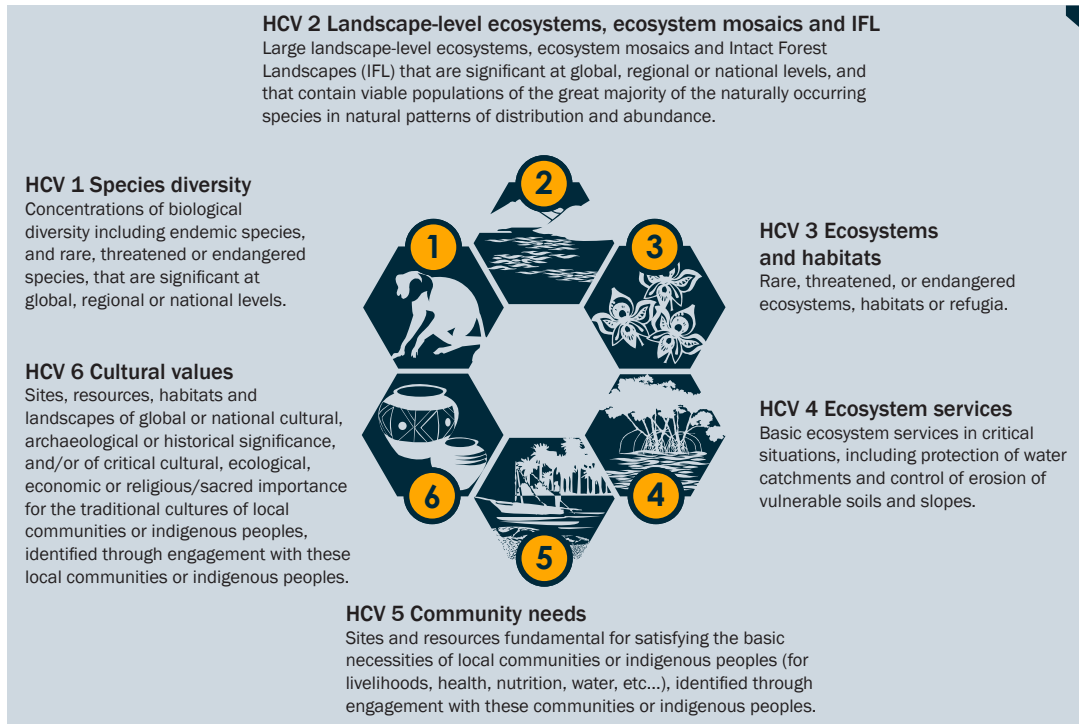


Figure 1: The six categories of HCVs (HCV common guidance)



Since then, the scope has widened from ‘HCV Forest’ to ‘HCV Areas’ acknowledging:

- That these values apply across all landscapes to include both forest and non-forest ecosystems.
- The objective is to take management actions which maintain (or enhance) the conservation values themselves.

The HCV approach is widely adapted within voluntary certification schemes, notably in forestry and agriculture, forms part of corporate sustainability commitments and policies, and is increasingly recognised in national or regional policy.

The government and people of Bhutan recognize the environmental, social and cultural values in the development process and accordingly places top priority to the protection of the cultural and natural heritage including supporting community needs. The HCVs as a holistic approach can further complement and strengthen these efforts and initiatives of the country. Therefore, recognizing the benefits of the HCV approach it was introduced in 2020 in Bhutan by WWF through the living landscapes program of the International Climate Initiative (IKI)² project.

1.2 Aim and purpose of the HCV NI

The primary aim of the HCV approach is to maintain and/or enhance the environmental, social and cultural values, using a three-step approach: identification, management and monitoring³ as illustrated under figure 2.



Figure 2: The three steps of HCV Approach

This document will dwell only on the first step i.e. the Identification stage. It is envisaged to serve as the guide for divisional forest staff, resource managers, auditors, academicians, students, scientists, and researchers to interpret different categories of HCVs in the context of Bhutan. This document is to be used in conjunction with

² The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

³ Common Guidance for the identification of High Conservation Values. HCV Network.

HCV Network’s HCV Common Guidance for the Identification of high conservation values. Bhutan’s NI document provides guidance on interpretation of the HCV definitions and enables their identification in the context of Bhutan.

This document is not binding like the HCV Common Guidance, and it is to be used as a guide to ‘best practice’. This NI must also be used in conjunction with existing legislations relevant to HCVs in the country.

1.3 Process for development of HCV NI

This NI document has been developed through a series of consultative processes besides diligently following the standard best practice guidance of HCV Network on development of HCV NI.

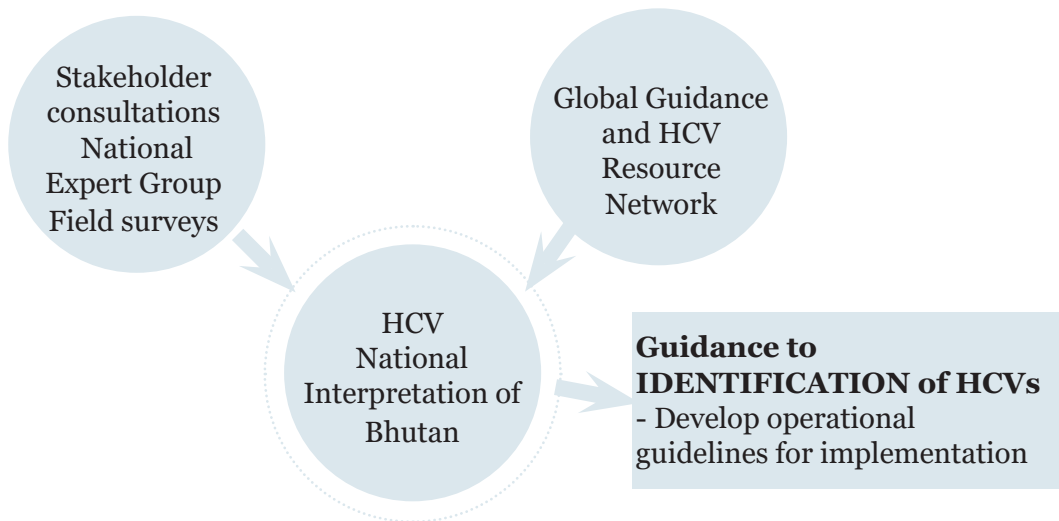


Figure 3: The process in development of the Bhutan NI

The protection of HCVs as stated earlier entails a multi-step approach: identifying HCVs, developing and implementing management and monitoring plans, and using an adaptive management approach. This has been further illustrated under figure 4. The HCV approach can be applied at a range of scales. For instance, it is used as part of jurisdictional land use planning, and for improving forest management practices in Community Forests.



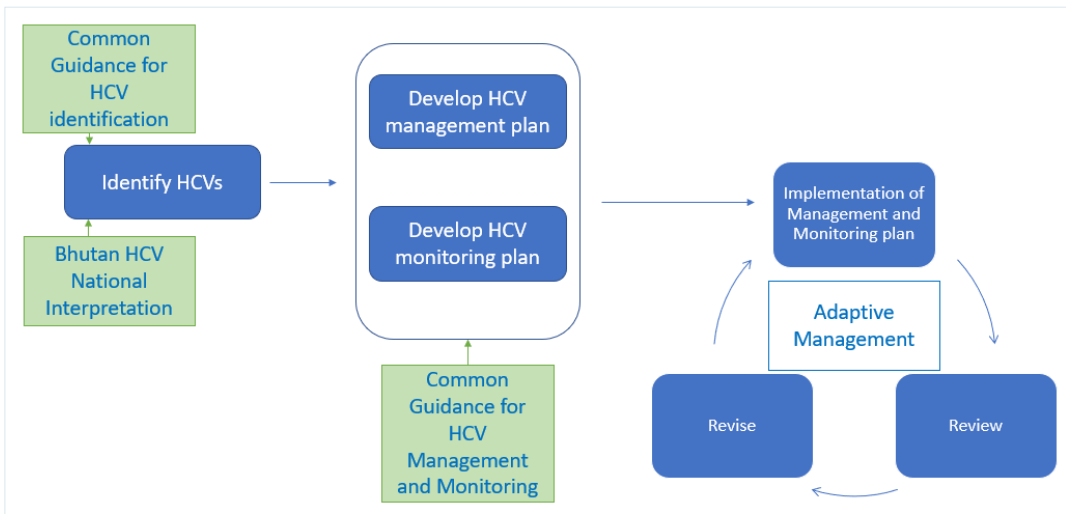


Figure 4: The HCV process and guide documents at various stages along the process

The same process applies to all of these contexts, and whatever scale at which the HCV approach is being used, the first step involves identifying the HCVs.

HCVs are absolute in the sense that they apply all over the world, irrespective of ecosystem, management context or commodity. Consequently, the HCV definitions (Fig.1) are the same for all users. However, the definitions are generic and brief, and to be operational, the formulations need to be interpreted in the national or regional context. HCV National Interpretations was developed through multi-stakeholder processes with balanced representation from all major interest groups. This is to ensure their various views and expert knowledge are accounted for, while also improving awareness and understanding on how the HCV concept can contribute to achieving national or local sustainability objectives. These HCV Interpretations interpret the key terms and concepts for each HCV category in the national context, provide additional information to support the identification of HCVs, and provide some local guidance on management and monitoring. This allows everyone in a region to use the same framework, which is key to avoid repetition and enable standard and cost-effective practices. The HCV National Interpretation, along with other HCV guidance documents support at various stages of following the HCV process.

2. Scope and opportunities for HCV in Bhutan to enhance the vision of Gross National Happiness

Bhutan is characterized by rugged mountainous terrain with elevations ranging from 160 meters to more than 7,000 meters above sea level. The relatively pristine state of the natural environment and abundance of biodiversity has made the country an important conservation refuge. Increasingly, Bhutan is recognised as a model for conservation. The country’s development philosophy based on Gross National Happiness has environmental conservation as one of its four pillars. Bhutan’s biggest strength lies in conservation of its environmental and cultural heritage, and therefore any means to enhance this conservation story will be an endowment for the country and its people. As such, embracing the concept of High Conservation Value will only further complement and support the conservation initiatives of the country. The opportunities of pursuing the HCV approach are immense as shown under figure 5. This is further described within the context of the country’s conservation status, cultural preservation, community needs, and support national and international conservation commitments.

The promotion of the HCV approach in Bhutan will offer opportunities to:

Protect the forests and promote biodiversity conservation	Promote and preserve the cultural values	Safeguard the ecosystem provisions to meet community needs and services	Strengthen conservation legislation	Strengthen carbon neutrality and build climate resilience	Promote multi-stakeholder engagement and enhance integrated management
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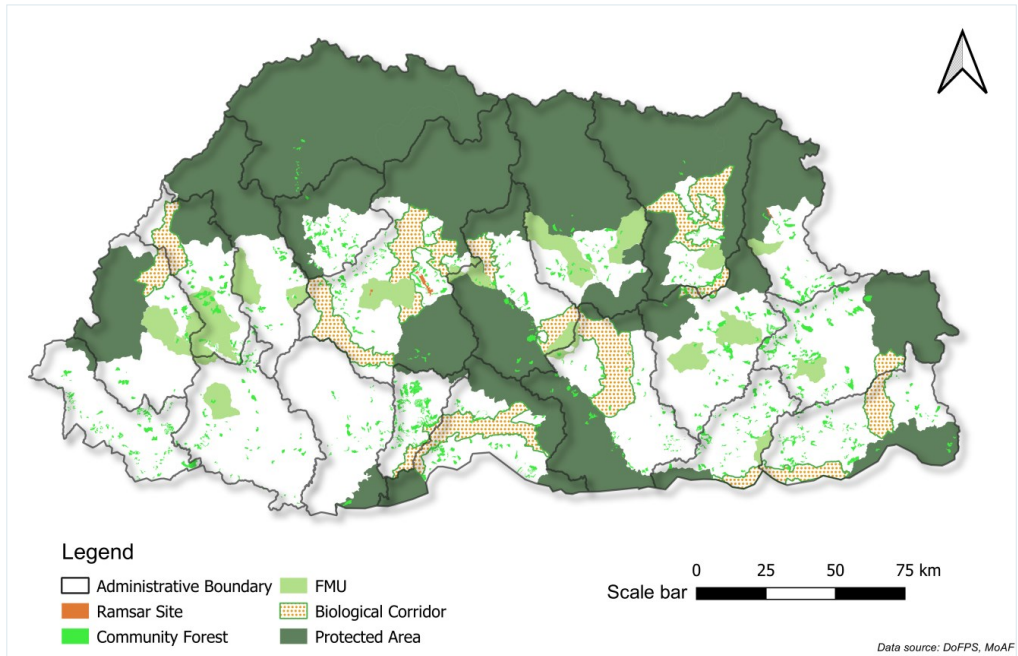
Figure 5: Scope and opportunities to promote the HCV approach in Bhutan

2.1 Protecting the forests and promoting biodiversity conservation

Forest cover encompasses approximately 71% of the geographical area of the country including important expanse of intact forests harbouring important flora and fauna assemblages. Taking advantage of the state of the natural environment, Bhutan has made significant commitment to the protection of the rich biodiversity. This is demonstrated through the dedication of an extensive network of protected areas comprising of 51.44 % of the country, consisting of national parks, wildlife sanctuaries, strict nature reserves, recreational parks and biological corridors. However, the country’s biological richness extends beyond the protected areas to include Forest Management Units (FMUs), Community Forests (CFs), Local Forest



Management Areas, and Private Forests within the production landscapes. These areas also harbour important species or values that need to be protected. Forests also provide regulating ecosystem services and play a critical role in supporting the livelihood of the people, especially the local communities. Therefore, identifying the existence of the six HCVs beyond the protected areas system will be critical in securing the protection and management of these values.



Map 1: Protected areas and forestry management regimes in Bhutan.

2.2 Promotion and preservation of the cultural values

The unique and vibrant culture of Bhutan has been laid on strong foundations giving a strong identity for the Bhutanese people. The rich culture and tradition encompass both tangible and intangible heritage. Bhutan places high emphasis on the preservation of the cultural heritage and believes that the nation stays alive if the culture stays alive. Recognizing its importance, preservation and promotion of culture is one of the pillars of the development philosophy of Gross National Happiness. However, it becomes increasingly challenging to uphold the cultural values while embracing rapid modernisation. The preservation of structures, community, spiritual values, and age-old traditions are being threatened in the process of modernisation. HCVs, especially HCV 5 (Community needs) and HCV 6 (Cultural values) can support and enhance the promotion and preservation of the cultural heritage.

2.3 Safeguarding the ecosystem provisions to meet community needs and services

Agriculture is the main source of livelihood in the country. The local communities, which form the major portion of the population are entirely dependent on the ecosystem. The conservation of the natural environment to ensure sustainable ecosystem services is critical. Ecosystem services include good soil, clean water and air, and ambient climate essential for food production and sustaining the livelihood of the people. The HCV approach offers the opportunity to protect ecosystem functions and sustainably harvest human needs from the ecosystem to support the well-being of the community.

2.4 Strengthen conservation legislation

Bhutan is one of the few countries in the world that has made serious commitment in pursuit of environmental conservation. This is demonstrated through its stringent conservation policies enshrined in the laws of the country. Gross National Happiness, the overarching development philosophy of the country embraces environmental conservation as one of its four pillars. The constitution mandates a minimum 60% forest cover for all time. Other legislation includes the National Forest Policy 2011, Forest and Nature Conservation Act 1995 (which is presently being revised), Land act 2007, Biodiversity Act 2003, Environmental Assessment Act 2000, and the National Biodiversity Strategy and Action Plan. Recently, in order to consolidate the environmental laws, the government constituted an Environmental Law Review Committee (ELRC) led by the attorney general. This committee will review, harmonise, and consolidate environment and conservation laws under a single umbrella act, as reported in the Kuensel issue, dated 26 January 2022. This initiative is expected to eliminate competing authorities, duplicative roles and functions of each agency while making implementation more transparent and effective.

Much of the policies have been implemented on the ground. The stringent conservation regulations and vast areas dedicated to conservation has influenced many international donors to support Bhutan's conservation efforts. The country has been innovative in conservation financing with the establishment of the Bhutan Trust Fund for Environmental Conservation in 1991 as the world's first environmental trust fund. It is an independent grant-making organization created to sustain financing for Bhutan's conservation programmes. In a similar approach in 2018, the Bhutan for Life fund was created as a mechanism to permanently finance the protected areas of the country.

Despite these favourable national policies and programmes, there are challenges in



realizing and sustaining the ambitious climate and conservation goals in the long run. Biodiversity conservation outside Bhutan's protected area system compete with other land-use interests and land-cover changes such as agriculture, road construction, quarry mining and hydropower related infrastructure. Human pressure on land is very high as the country has only 7% of arable land located in the plains and valleys - the rest is characterized by steep or inaccessible terrain where infrastructure development is challenging and may have severe environmental impacts. Adopting the HCV approach can help in mitigating many of these challenges.

2.5 Strengthen carbon neutrality and build climate resilience

As a landlocked mountainous country with fragile mountain ecosystem, Bhutan is highly vulnerable to the impacts of the changing climate. Nature with its biodiversity and ecosystem services helps in adaptation and mitigation of climate change. Protecting and maintaining it, therefore, is a crucial part of our effort to combat climate change. Bhutan has committed to remaining carbon neutral forever, enshrining its commitment to maintain 60% of the country under forest cover for all times. Furthermore, the country submitted, at COP21, an ambitious program of mitigation and adaptation laid out in its 2015 Nationally Determined Contribution (NDC) under the Paris Agreement, which put forward nine mitigation strategies and ten adaptation strategies with a strong focus on forest conservation and climate-smart natural resources management. Hence, pursuing the HCV approach is an opportunity to augment these efforts, by identifying which forests provide the greatest biodiversity and social co-benefits, and therefore should be prioritised in meeting the NDC.

2.6 Promote multi-stakeholder engagement and enhance integrated approach to management

Unlike other concept or approach, the HCV approach is a holistic tool which not only considers ecological, biological and environmental values but social and cultural values too. Therefore, it offers an opportunity for multi-stakeholders to engage and collaborate and build effective partnerships. It also offers opportunity for integrated management of limited land resources to fulfil the needs of competing priorities. Hence, it contributes towards sustainable and holistic development through proper planning and management.

3. HCV approach in Bhutan

Much has already been done in Bhutan to assess Bhutan's natural capital and identify risks. The advantage of the HCV approach is that it provides a holistic framework to bring this existing knowledge and studies together, so that the range of conservation

values are treated together rather than in technical or thematic silos, when it comes to conservation planning and management decisions. It provides a way to identify where there are high pressures on lands and ecosystem services, and therefore where to focus effort and on what, with this being done at a range of scales and by a range of users. HCVs can be identified and promoted in any area holding high ecological, biological, cultural and social values. It can be applied across different ecosystems, cultural sites and production landscapes. In Bhutan the application of HCV approach will be used beyond the protected areas.

The primary applications of the HCV approach in Bhutan are for:

- national land use planning and to improve inter-ministerial alignment on land use designations and processes that avoids negative impacts on important cultural and natural heritage, and understanding the local safeguards (i.e., cases where further detailed assessments and/or consultation with local communities) that should be put in place.
- informing landscape (which includes both environmental and cultural) level conservation planning and prioritisation, and
- supporting Divisional Forest Offices to develop holistic sustainable forest management plans, by supporting the local identification of conservation values, understanding the threats, and incorporate measures for maintaining these conservation values into the management plans.

These collectively contribute to achieving national or local environmental, social, economic, and cultural conservation objectives. The users will consist of relevant government agencies, NGOs, and other state owned enterprises.

The National Interpretation of Bhutan has been developed to provide a common understanding of the six HCV categories in Bhutan by the various decision-making stakeholders.

The National Interpretation provides, for each of the six HCV categories:

- information on what are considered High Conservation Values within the Bhutanese context to inform identification of HCVs (whether at the site-landscape- or national- level)
- the indicators of what is highly likely to meet the HCV definitions, along with accessible information sources, databases and initiatives relevant to each of the six HCV categories, as well as information on the general threats, and



- the stakeholders or organisations that may be engaged with particular expertise and having specific stake in relevant values.

3.1 Use of HCV National Interpretation

There are several anticipated applications of the HCV Approach in Bhutan, with the national interpretation providing reference material to inform these processes.

- Integrating HCV into National Land Use Zoning (NLUZ) process.

During a training hosted in 2020, participants identified several areas where the HCV Approach supports achieving NLUZ objectives. The HCV National Interpretation contributes to consolidating stakeholders' collaborations and cooperation in bringing about a common consensus in making priorities. The HCV interpretations, indicators and information sources within this document provide a basis for mapping areas likely to have HCVs at the national or sub-national level, as well as areas where field data collection would improve the large-scale maps. This forms an integrated component of implementing the NLUZ by providing the data to identify priority areas for conservation based on the probabilities of HCV presence and likely threats to these values (termed screening HCVs at landscape or jurisdictional scales). A national or subnational screening of HCVs indicates where there are low, medium or high risks to HCVs, which can be used to structure a local (Dzongkhag) government 'response protocol', i.e. the specific safeguards/procedures that should be triggered case-by-case by proposed development projects depending on the HCV risk outcome in a given area.

- Support in developing and implementing DFO management plans

Identifying HCVs in an area does not necessarily imply designating these areas of protected areas; good forest management practices are often consistent with maintaining HCVs, and equally maintaining HCVs contributes to the long-term viability of the forests themselves in provisioning essential services, including water protection, timber and non-timber forest products.

As with NLUZ, the National interpretation provides the indicators and data-sources for landscape screening of HCVs to provide information on the specific HCVs and therefore priorities within a district. As part of developing holistic forest management plans, this informs district level planning and follow up, by identifying the priority field work for identifying HCVs. The field work can be guided both by the indicators, data-sources and relevant stakeholders presented in the Bhutan National Interpretation and Common Guidance for the identification of HCVs.

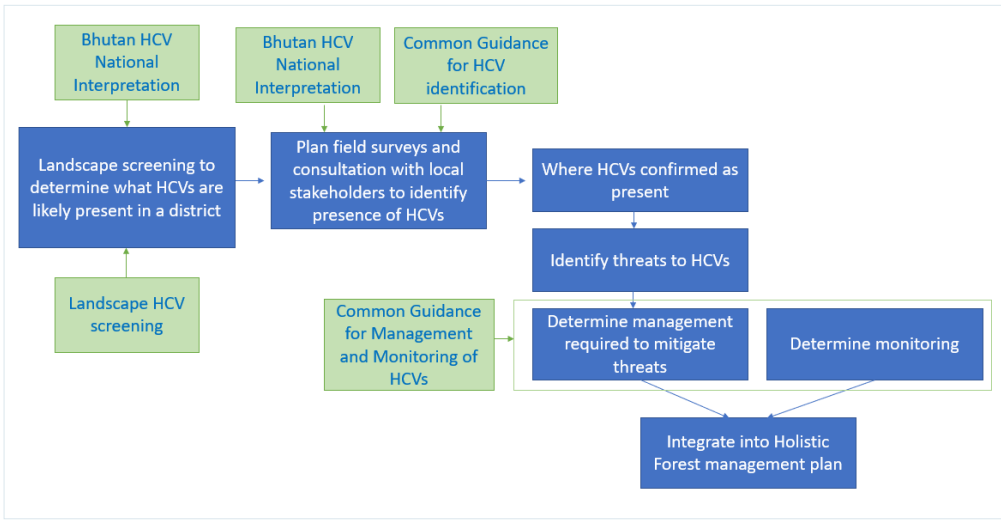


Figure 6: Process for integrating HCV into the development of DFO management plans

4. The Key principles for using HCV approach

An overview of some of the key principles of relevance to Bhutan to successfully implement the HCV approach is shown under figure 7 and subsequently explained.

- Stakeholder consultation for consensus and national ownership
- Compliance with International, national, local laws
- Application of the Precautionary principle

Figure 7: overview of key principles for using HCV approach

4.1 Stakeholder consultation for consensus and national ownership

The holistic nature of the HCV concept with ecological, biological, social and/or cultural components, brings a need to involve and engage with a diversity of stakeholders. Effective stakeholder consultation will lead to transparency contributing to consensus and local or national ownership. The common guidance emphasizes that stakeholder consultation is valuable for the following reasons to:



- i. help the manager evaluate whether a certain value is present.
- ii. help the manager design a proper management regime for maintaining the value.
- iii. ensure that the rights and needs of the local communities are respected, and appropriate support is provided for addressing conflicts in maintaining environmental conservation values.

Consultation allows the assimilation of different views and opinions, particularly with respect to agreement on what might constitute HCV in an area. The effectiveness and legitimacy of the consultation process depends on identifying the great majority of opinions, relevant information and options. Section 6 of the document provides a profiling of potential stakeholders in Bhutan. Absent in this list are local communities, who should also be consulted and engaged where planning is taking place.

4.2 Compliance with applicable international, national, and local laws.

The HCV charter stipulates that users of the HCV approach shall comply with all applicable international, national and local laws. These include international conventions and treaties, and laws and regulations of state, dzongkhag and gewog related to land use, natural resource management, and local people's rights, traditions and consent (see also section 2.4).

4.3 Using the precautionary principle

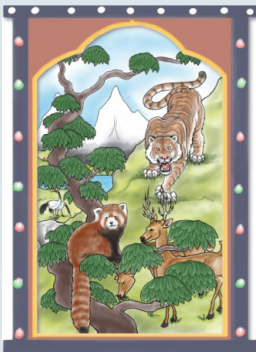
The Precautionary Approach, as explained in the common guidance, means that when there is a threat of severe or irreversible damage to the environment or a threat to human welfare, responsible parties need to take explicit and effective measures to prevent the damage and risks, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of values are uncertain. In the context of HCV identification, this means that when there are reasonable indications that an HCV is present, the assessor should assume that it is present. It also means that managers should take action to maintain the value, through protection or other means, appropriate to the risk of loss of habitats or natural resources for local peoples.

PART 2

Interpretation and identification of the 6 HCVs

5. National Interpretation for each HCV

5.1 HCV 1: Species Diversity



Definition

Concentrations of biological diversity including **endemic** species, and **rare, threatened or endangered (RTE)** species that are **significant** at global, regional or national levels.

5.1.1 Interpretation of the key terms and concepts

Concentration of biological diversity

This relates to concentration of any biological diversity of significance globally, regionally or nationally. Although it states as concentration, the stakeholder consultation for the NI deemed that the presence of any RTE species in an area can be considered important enough to warrant being HCV 1. These include species listed in the IUCN Red List or in the list of the totally protected species under the prevailing forestry acts and rules.

Rare, threatened or endangered (RTE)

In the context of Bhutan, the following species are considered, rare threatened or endangered species:

- Species classified according to the IUCN Red List of threatened species in the following categories as Critically Endangered, Endangered and Vulnerable, which are all species threatened with global extinction.



- Schedule I under the list of totally protected wild animals and plants of the FNC Act of Bhutan (annexure 1).
- CITES Appendix I and Appendix II (annexure 2).
- Native species that have become nationally or locally rare through over-exploitation, e.g., harvested as NTFPs.
- The presence of any breeding pair of species considered to be of exceptional conservation significance at the local or national level by general stakeholder consensus. Example: the presence of white-bellied heron, and/or potential breeding site for this species.

Endemic species

Any species that is endemic to Bhutan is considered as an HCV1. This refers to species that are only found within a restricted geographical region, which may range from a unique site or a geographical feature (such as a valley, mountain range or river basin), to a political boundary such as a dzongkhag, to Bhutan, or to the eastern Himalayas region. Endemic and range-restricted species are particularly vulnerable to threats as they have a limited distribution and may have smaller populations than widespread species. Due to the general lack of species inventory data on many taxonomic groups, little is known on the level of endemism to Bhutan, and hyper-endemic areas have not been identified.

The Flora of Bhutan records more than 5,600 species of seed plants out of which approximately 94 per cent are native species, or which about 105 species are currently endemic to Bhutan (NBSAP, 2014).

5.1.2 Identification of HCV 1

Some of the indicators and data sources are given below to help in the identification of HCV 1. The assessor should not only depend on this information, but other sources too must be explored, as it is not an exhaustive list.

Indicators	Information sources
Concentration of biological diversity ⁴	<ul style="list-style-type: none"> ▪ Field survey can collect data on species abundance and frequency to estimate the species diversity indices

⁴ Although the HCV approach in Bhutan is being used for conservation prioritization outside of existing protected areas, however the National Interpretation does recognize that PAs are considered HCV1 in line with the International best practice.

<p>Presence of apex predators' example tiger, snow leopard, etc.</p> <p>Presence of umbrella species</p>	<ul style="list-style-type: none"> ▪ National Tiger survey report and distribution maps (BTC) ▪ National Snow Leopard survey report and distribution maps (NCD) ▪ Elephant survey (NCD) ▪ Takin habitat distribution map (NCD) ▪ White bellied heron report and distribution map (RSPN) ▪ Mammals of Bhutan ▪ Rufous necked hornbill survey report (UWICER) ▪ Musk deer distribution (UWICER) and other field report ▪ Area specific field reports and publications ▪ Blue poppy report (SWS -to check- Journal of Threatened Taxa) ▪ Golden Mahseer data, info and distribution info (NCD and WWF Bhutan) ▪ Management plans (PA, FMU, CF, LFMP) ▪ Spatial Monitoring and Reporting Tool (SMART) Report: Cross conservation Area analysis report <p>Data can be augmented with field survey and data collection exercise, such as Rapid biodiversity assessment. Abovementioned are a few sources but not an exhaustive list.</p>
<p>Areas with endemic and RTE species</p>	<ul style="list-style-type: none"> ▪ National Forest Inventory reports for presence and absence of species (FRMD, DoFPs) ▪ Bhutan Biodiversity portal for listing, occurrence and distribution (NBC) ▪ Field reports (e.g. on Blue poppy and white poppy, Bhutan Glory, Liverwort, Orchid species, Tsendhen in Dangchu, Ginseng , Sal forest in Phibsoo) ▪ UWICER research and publications on butterflies, dhole, canids ▪ Area-specific field reports and publications ▪ Reports and distribution map on medicinal plants ▪ List of species as per the FNC RR 2017 ▪ CITES Appendix I and II ▪ IUCN Red list ▪ Management plans (PA, FMUs, CFs, LFMPs) ▪ SMART Report: Cross conservation Area analysis report



<p>Presence of RTE birds</p>	<ul style="list-style-type: none"> ▪ White bellied heron report ▪ Black necked crane reports ▪ Expert group -Bhutan Bird life Society ▪ Birds of Bhutan ▪ Area specific field reports and publications ▪ Management plans (PA, FMUs, CFs, LFMPs) ▪ SMART Report: Cross conservation Area analysis report ▪ Journal of Threatened Taxa
<p>Local studies that confirm the presence of HCV 1.</p>	<p>Field studies and biodiversity inventories Consultation with stakeholders including:</p> <ul style="list-style-type: none"> ▪ Relevant taxonomic experts ▪ Representatives from local communities including healers and people with traditional knowledge
<p>Any breeding pair of species considered to be of exceptional conservation significance at the local or national level by general stakeholder consensus. Example the presence of black-necked crane, and/or potential breeding site for this species.</p>	<ul style="list-style-type: none"> ▪ Field reports (camera trap) ▪ Publications ▪ Field exercise: area mapping ▪ SMART Report: Cross conservation Area analysis report
<p>Areas with viable populations of several RTE species (as defined above) and/or endemic species</p>	
<p>Presence of mineral saltlicks</p> <p>Seasonally important sites for birds.</p> <p>Known habitats or nest sites for RTE species</p> <p>As indicators for seasonal concentration of species</p>	<ul style="list-style-type: none"> ▪ Area specific Field reports on sightings ▪ Any publications

Another useful source of data is from individual experts who have practical experience but may not have documented evidence. One such example is the birding enthusiasts in the country. Through their passion they have much knowledge of important species of birds and their habitats. Likewise, lots of resourceful information remains with local experts and communities who need to be consulted.

5.1.3 Examples of HCV 1

Few examples are quoted below along with a case study to make it easier to identify other HCV 1.

Blue Poppy (*Meconopsis gakyidiana*)



The national flower of Bhutan was previously thought to be *Meconopsis grandis*. In 2017, following a research collaboration between the Blue Poppy Society of Japan, and the National Biodiversity Center of Bhutan, it was found to be a misidentification. The species is now recognized as *Meconopsis gakyidiana*. It is native to Eastern Bhutan, Western Arunachal Pradesh (India), and Southern Xizang (China). It can be found in elevation ranging from 3,700 – 4300 meters.

(Source: https://en.wikipedia.org/wiki/Meconopsis_gakyidiana)



Bhutan Takin (*Budorcas taxicolor whitei*)



(Photo credit: UWICER)

It is the national animal of Bhutan and believed to have been created through the magical powers of the Lam Drukpa Kuenley, popularly known as the divine madman. It is a subspecies of Takin that is native to Bhutan. Their habitat ranges from 1,000 to 4,500 meters in the western part of the country with the maximum numbers in Jigme Dorji National Park. During winter they move to lower elevations in small herds while in summer they stay in higher areas congregating in large herds. Estimated population in Bhutan is between 500 – 700 individuals. Their main threats are habitat loss and disturbance to their migration routes due to developmental activities.

Liverwort (*Bazzania bhutanica*)



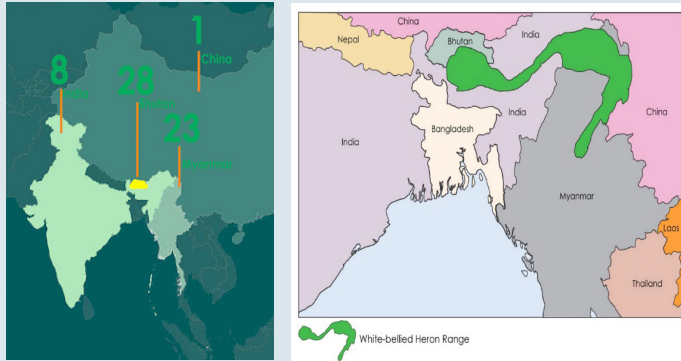
It is a critically endangered species previously known to be endemic in Bhutan, has also been recorded in India. It is found in the sub tropical forests of Bhutan. It was discovered in 1982 (A.J.C Grierson and DGL) during one of the botanical expeditions in one of the ravines of the forests in Samtse. Subsequent surveys have revealed two colonies of the species found in Samtse. Anthropogenic activities and deforestation are some of the potential threats.

Reference

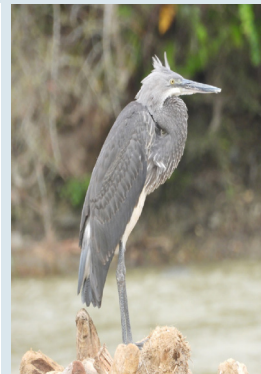
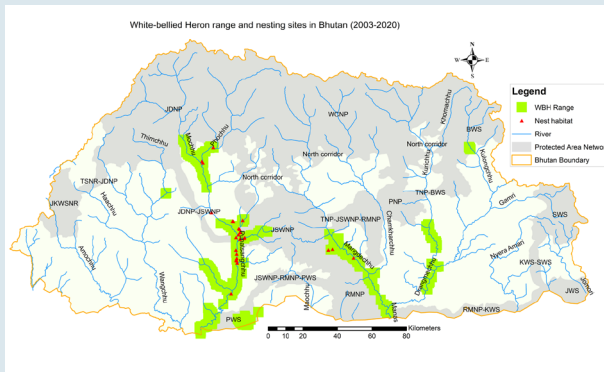
Long D. G, Gurung B. R. & Pradhan R. (2009). *The rediscovery and conservation status of Bazzania bhutanica in Bhutan*. Bryophytes Abroad.

Case study for HCV 1: White-bellied Heron (*Ardea insignis*)

The White Bellied Heron is one of Asia's rarest birds with a global population between 50 – 249 (IUCN, 2021). Its current range countries include Bhutan, India, Myanmar and China. The IUCN classifies it as Critically Endangered, meaning it is at significant risk of extinction.



In Bhutan it is found along the two river basins, Punasangchu and Mangdechu covering the Dzongkhags (Districts) of Punakha, Wangduephodrang, Tsirang, Dagana, Trongsa, and Zhemgang. It is greatly threatened by anthropogenic activities such as river mining for natural resource extraction, hydropower development, and fishing.



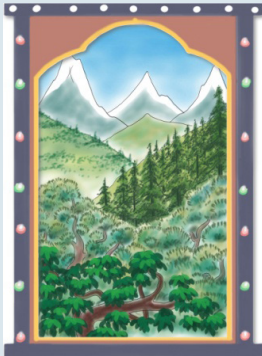
Several studies have been conducted by the Royal Society for Protection of Nature (RSPN). Ongoing research and efforts by RSPN aim to enable habitat restoration for the existence of a viable population of WBH in Bhutan. Some of the initiatives include the establishment of the WBH breeding centre and promoting community-based ecotourism to encourage local communities to support WBH conservation program in Bhutan.

References

- Acharja, I. P. (2020). Evaluation of nest habitat, site preferences and architecture of the critically endangered White-bellied Heron *Ardea insignis* in Bhutan. *Bird Conservation International*, 30(4), 599–617. <https://doi.org/10.1017/S095927091900042X>.
- Drorji, J. (2011) *Protecting White-Bellied Heron habitat: extent of anthropogenic threats and people's attitude towards their conservation in Bhutan*. MSc dissertation, College of Natural Resources, Lobesa, Bhutan.
- RSPN (2019). *White-bellied heron conservation strategic plan 2019-2039*. Thimphu
- RSPN (2021). *White Bellied Heron Conservation Center Plan*. Thimphu



5.2 HCV 2: Landscape-level ecosystems and ecosystem mosaics and Intact Forest Landscapes



Definition

Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFLs) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

5.2.1 Interpretation of the key terms and concepts

Landscape-level ecosystems and mosaics

In principle, threshold size for HCV 2 should be related to the area needed to maintain viable populations, especially of large or wide-ranging species. While the size to qualify as HCV 2 area may differ depending on the assemblage of species, 50,000 hectares (500 km²) is often considered a minimum. Large landscape-level ecosystems in the context of Bhutan includes (NBSAP, 2014):

- Alpine meadows and shrubs
- Temperate zone forests
- Sub-tropical zone forests
- Chir pine forests and tropical lowland forests

Viable populations of the great majority of species

Many large landscapes are disturbed by developmental activities or other forms of anthropogenic interference. Therefore, to be realistic it is not necessary that the area is totally undisturbed or pristine to qualify as HCV 2. Even if some species are missing, HCV 2 status can apply if there is a reasonable chance of these being re-established in the future. HCV 2 often includes ecosystems that contain important sub-populations of wide-ranging species (e.g., tiger, elephant, snow leopard). The area needs to be large enough to avoid genetic inbreeding.

Natural patterns of distribution and abundance

This refers to the state of the ecosystem being intact and where ecological processes and functions are wholly or relatively unaffected by human activities. The key here is to maintain not only the extent of the ecosystem and the viable populations of species, but also their range and their patterns of abundance. It is not necessary to measure or estimate accurately the distribution and abundance of species or populations. However, a large ecosystem may not qualify for HCV 2 status if it has lost many of the species typical of such ecosystems in their natural state or been so heavily disturbed that there is reason to believe that the spatial distribution of species and their relative abundance and regeneration has been seriously and permanently altered. HCV 2 does not include man-made, converted, heavily degraded or fragmented ecosystems, extensively modified by human activity, especially land clearance and farming. HCV 2 is also ruled out in large ecosystems with features such as dominance or significant presence of invasive species, disrupted age/size class distributions of populations, and a loss of significant ecosystem processes (e.g. fruit masting, dispersal of key species).

5.2.2 Identification of HCV 2

Some of the indicators and data sources are given below to help in the identification of HCV 2. The assessor should not only depend on this information, but other sources too must be explored, as it is not an exhaustive list.

Indicators	Information sources
Relatively intact ecosystems or ecosystems mosaic that connect to protected area network	<ul style="list-style-type: none">▪ Land Use Land Cover maps (FRMD, DoFPS, NLC)▪ Forest Type and canopy density map (FRMD)▪ Report on degraded and barren land (SFED)▪ Drivers of Deforestation and forest degradation study (WMD)▪ Intact Forest Landscape map and data intactforests.org▪ White-bellied Heron degraded and potential habitat maps (RSPN) <p>*Additional Remote sensing exercises for assessing degradation and deforestation if required for field verification should be done.</p>



Ecosystem landscapes with presence of viable populations of flora and fauna which could include key biodiversity areas.	<ul style="list-style-type: none"> ▪ Knowledge of species occurrence ▪ Tiger Conservation Landscape (WWF) ▪ Population survey or population reports ▪ CA TS (Conservation Assured/Tiger Standards) ▪ National Forest Inventory report
Non-forested landscapes typical in Bhutan like the rangelands/Alpine ecosystem	<ul style="list-style-type: none"> ▪ Land use and land cover maps ▪ Expert views

5.2.3 Examples of HCV 2

***Nyala Duem* forest**

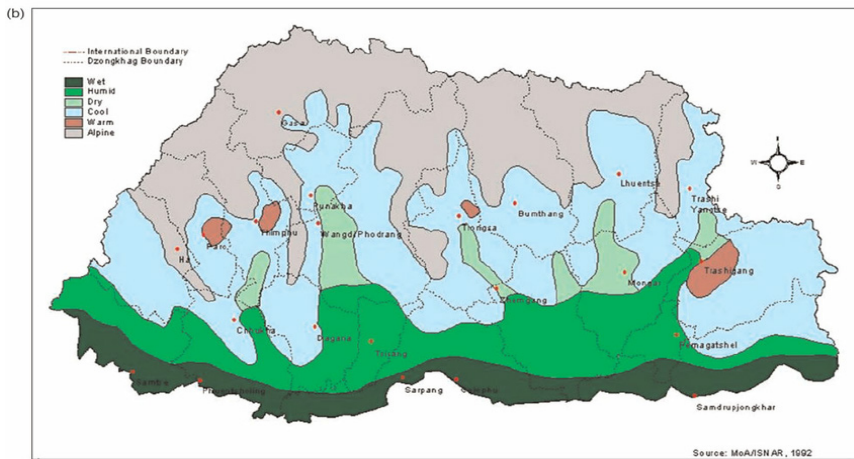


Photo credit BBS

This forest lies between Wangdue Phodrang and Trongsa. After crossing Chendebji one comes across a dense forest called the Nyalalum. The forest still remains pristine largely because of the belief that it is the home of the demoness, *Nyala Duem*. Legend has it that the Duem (demoness) had the power to transform herself into different forms to terrorize people. Due to the fear, the forest remains intact and undisturbed.

The Alpine region in the country

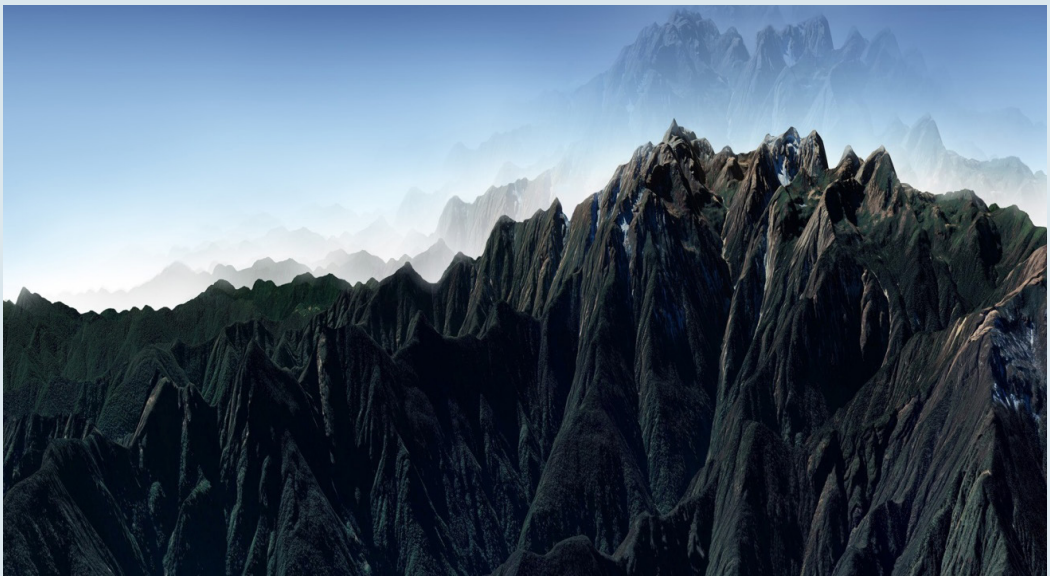
The alpine region lies over 3,500 meters and covers an extensive area in the northern part of the country (see map). Its inhabitants are pastoralists herding Yaks and depend on the rangelands. Due to the harsh climatic conditions, there is limited anthropogenic activity. However, climate change is impacting the area. The alpine region harbors several species of flora and fauna including several endemic, rare and threatened species. It is also the repository of water with several glacial lakes. Any disturbance to the nature in the alpine region can have devastating impacts on the lower regions of the country. Thus, it is important to secure the high conservation value of this region.



5.2.4 Case study: Black Mountain range forest

The Black Mountains range, located in central Bhutan is part of the Jigme Singye Wangchuck National Park formerly known as the Black Mountains National Park. It falls within the districts of Wangdue Phodrang and Trongsa. Locally the mountain range is known as *Dungshing gang* meaning the peaks of fir. This pristine stretch of forest mainly consists of fir trees. This forest landscape could possibly be one of the most pristine and undisturbed ecosystems in the country. There is also a strong socio- cultural significance because of the belief in the presence of the local deity *Jowo Dungshing*. Several communities live within the periphery of the Black Mountains. One, being the Monpa community with their distinct identity, often described as the aboriginal inhabitants of the country.

The Black Mountains forest is probably one of Bhutan's best intact Forest Landscapes. It could undoubtedly qualify as an HCV 2 and be secured for protection.



(Photo credit: Jigme Singye Wangchuck National Park management)

5.3 HCV 3: Ecosystems and habitats



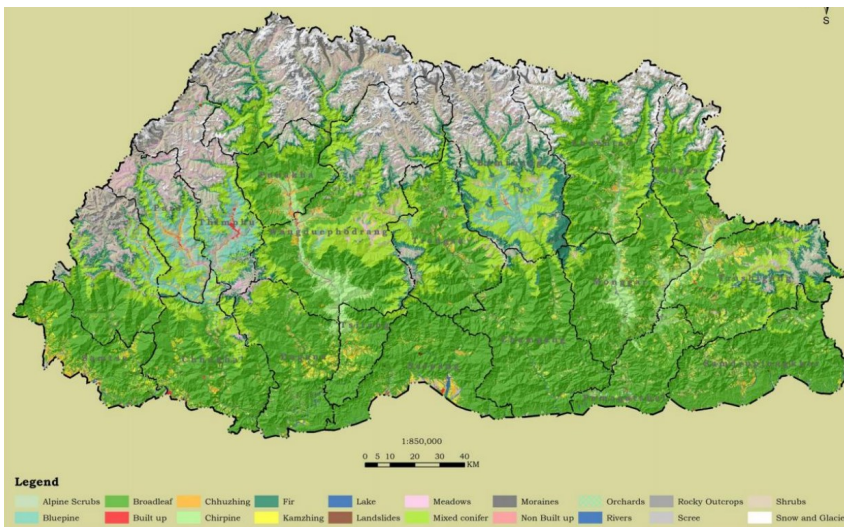
Definition

Rare, threatened, or endangered ecosystems, habitats or refugia.

5.3.1 Interpretation of the key terms and concepts

HCV 3 includes ecosystems, habitats or refugia of special importance because of their rarity or the level of threat that they face or their rare or unique species composition or other characteristics. An ecosystem that is common in one area or country may be scarce and fragmented (rare and threatened) in another area or country. Further rare areas refer both to ‘naturally rare’ areas, and those that have become rare through human impact/degradation, land use conversion etc.

Ecosystems are a “dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”. The ecosystem or the forest types in Bhutan can be classified under 4 different zones – subtropical, temperate, sub alpine, and alpine.



Map 2: Bhutan Land use and land cover 2016

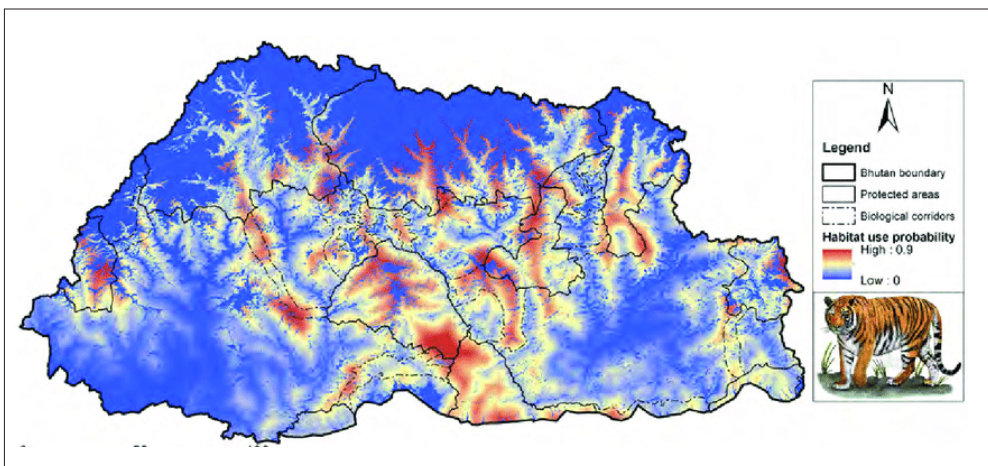


HCV 3 Ecosystems can be qualified as:

- Naturally rare, or
- Ecosystems that were once widespread but have become rare due to anthropogenic impacts or are rapidly declining due to current or proposed development.

The Land use and land cover 2016 in Map 2 (FRMD, 2017) provides the best available proxy for natural ecosystems in Bhutan at the national level. Some landcover classes can be considered naturally rare at the national level as they are naturally limited in their geographic extent compared with other landcover classes. This includes as an example chirpine and blue pine forests. Other landcover classes are more widespread but may be considered more threatened, for instance if not represented in the Protected Areas system (for example broadleaf forests) or threatened by other impacts such as from climate change (for example snow and glacier). At the local level naturally rare ecosystems include lakes and marshlands (NBSAP,2014).

Habitat: is the place or type of site that is inhabited by a population of species of animal, plant, or other type of organism. Habitats and ecosystems may be synonymous although habitats are considered within ecosystems. Habitats can range across many different ecosystems e.g. habitat of a tiger (Map 3). HCV 3 has a holistic perspective on ecosystems and focuses on these as functional units of species assemblages together with abiotic factors, while specific habitats for key species may often be more effectively considered under HCV 1.



Map 3: Tiger distribution/habitat map of Bhutan (NCD, 2018)

Refugia: are isolated or confined remnants of once larger distribution areas from which species may expand if conditions in the surrounding landscape improve.

5.3.2 Identification of HCV 3

Some of the indicators and data sources are given below to help in the identification of HCV 3. The assessor should not only depend on this information, but other sources too must be explored, as it is not an exhaustive list.

Indicators	Information sources
Designation as a Key Biodiversity Area (please see Box 1)	<ul style="list-style-type: none"> ▪ Key Biodiversity Area sites (NCD, DoFPS) ▪ Important Bird Areas (RSPN, Birdlife International and Bhutan Birdlife Society)
Areas identified as Ramsar sites	<ul style="list-style-type: none"> ▪ Details of Ramsar Sites (WMD, DoFPS)
Designation of IUCN green list of Protected and Conserved Areas	<ul style="list-style-type: none"> ▪ IUCN green list of protected and conserved areas in Bhutan
Internationally and nationally rare ecosystems and ecosystems rendered rare by developmental activities	<ul style="list-style-type: none"> ▪ Relevant international reports (e.g. Ecosystem Red list) ▪ Field assessments reports of the Divisional Forest Offices ▪ Telemetry studies on aquatic ecosystem and Golden Mahseer (WWF) ▪ Inventory of High-Altitude Wetlands (UWICER) ▪ Ecosystem Socio Economic Resilience Analysis and Mapping (ESRAM) case study in Mangdechhu and Punatshangchhu (RSPN) ▪ Consultation reports
Where ecosystem proxies indicate the presence of RTE ecosystems, even if these are inaccessible or have not been confirmed on the ground.	<ul style="list-style-type: none"> ▪ National Forest Inventory reports (FRMD, DoFPS) ▪ Climate data (NCHM) ▪ Climate Change Vulnerability Assessment (CCVA) reports

In addition

- Consultations of local communities and expert views on their knowledge related to RTE ecosystem/vegetation types.
- Relevant international reports like the Ecosystem Red list being developed under the coordination of IUCN. This list will reflect



extinction risks at local, regional and global levels, using the threat categories which are already used for species: Vulnerable, Endangered and Critically Endangered. Once operational, this can be a useful resource for Bhutan (see <http://www.iucnredlistofecosystems.org/>)

Box 1: Key Biodiversity Area Information Box

Key Biodiversity Areas (KBAs) are **sites contributing significantly to the global persistence of biodiversity** in terrestrial, inland water and marine environments. KBAs are identified according to five criteria: (A) Threatened biodiversity; (B) Geographically restricted biodiversity; (C) Ecological integrity; (D) Biological processes; (E) Irreplaceability through quantitative analysis (see KBA Standard for the full details). So, there is substantial overlap between the KBA criteria and HCV 1 (species), HCV 3 (ecosystems and habitats) and to some extent HCV 2 (large landscapes) definitions.

Due to the high overlap of the two, KBAs are one of several internationally recognised conservation designations, which are an indicator of HCVs 1, 2 or 3. In the Bhutan HCV National Interpretation, KBAs are listed as an indicator under HCV 3 to avoid repetition in the document. In Bhutan currently 25 KBAs are identified covering 13,877 km². Information on these sites is accessible through the KBA interactive online database. There is an ongoing national KBA identification process, led by the Department of Forests and Park Services in collaboration with WWF, and so new additional KBAs will likely be added in the future. Factsheets on each KBA site can be accessed from the database, providing information on the conservation species and habitats in each site. This information resource is particularly useful when planning HCV studies in the field. Equally, as the use of the HCV Approach is rolled out in Bhutan and biodiversity data is collected from areas not previously studied, this can help in validating proposed new KBA sites.

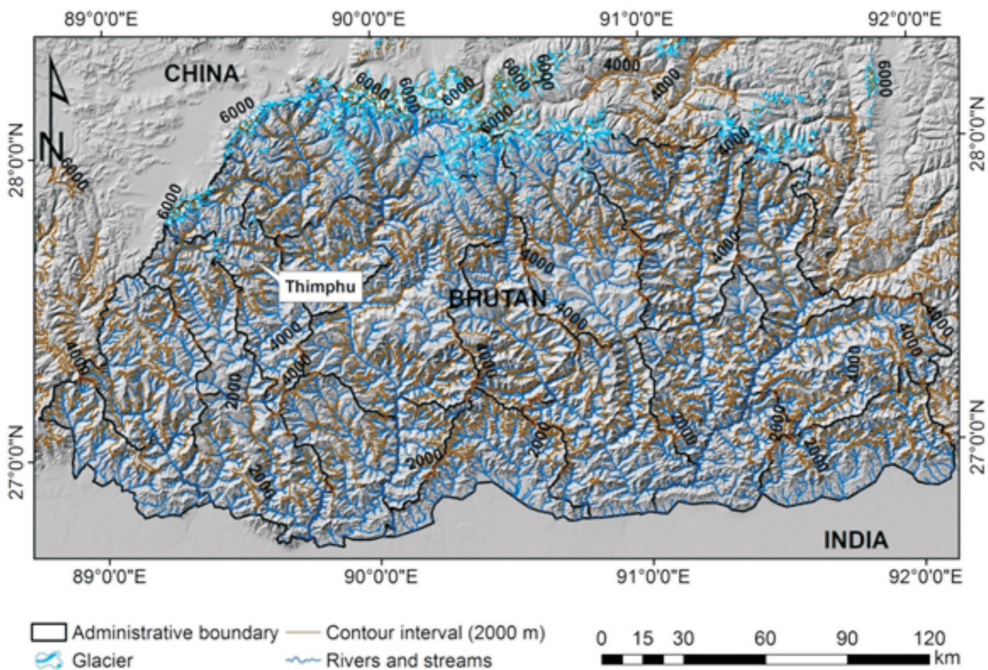
KBA criteria have quantitative thresholds of global significance that need to be met for a site to qualify as a KBA. The HCV definitions also recognize national and local significance and qualitative thresholds. So, although there is quite some overlap, areas that meet HCV 1-3 can extend beyond areas that would qualify as KBAs. As an example, a species assemblage which is considered nationally or locally significant (HCV 1) may not meet the KBA thresholds but would be captured using the HCV Approach.

Identifying, managing and monitoring KBAs and HCVs will help Bhutan track progress towards achieving targets in the Convention on Biological Diversity (CBD) post-2020 Global Biodiversity Framework.

5.3.3 Examples for HCV3

Alpine ecosystem/glacier lakes as a threatened ecosystem from climate change

The entire northern region of the country has glacier/snow-fed lakes. This makes Bhutan a water rich country. Much of the river systems in Bhutan are glacier fed. The global climate change is impacting on the glacial lakes posing severe risk to the livelihood of the people of Bhutan. Hydropower, the biggest revenue generator for the country too is at risk. Mool et al. (2001) identified 24 potentially dangerous lakes over the entire region of Bhutan Himalayas which poses the risk of downstream flooding. The conservation value of the northern alpine region is critical and its protection can be enhanced through the HCV approach.



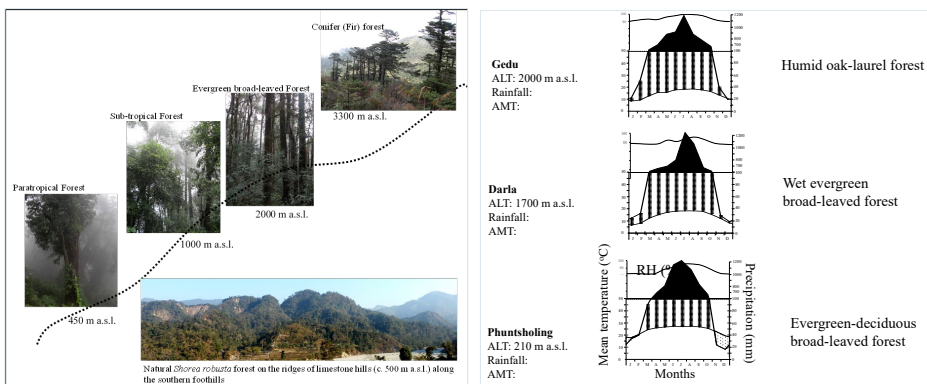
Map of Bhutan showing the glaciated areas marked in blue (source: Mahagaonkar A. et. Al, 2017)



5.3.4 Case study: Cloud zone forest; critical for conservation

Considering the importance of upper catchments (humid zones) as a critical habitat and water sources, a study was conducted along the two series (humid slopes & dry valley slopes) to determine the cloud-zone along the mountain slopes. Foothills (Phuntsholing 250 m a.s.l.) to Gedu-top (3370 m a.s.l.) as the outer humid slopes of Bhutan Himalayas was studied to determine the cloud-base (cloud-zone) using climatic indices and vegetation indicators. The study clarified that the lower limit of the cloud base was located around 1800 m a.s.l. based on the climatic indices and sharp change in humidity and temperature conditions. This zone corresponds to the most diverse ecosystem and habitats of the humid slope series and remains under cloud cover over for several months of the year. Floristically this zone showed important plant species such as relict and endemic plants (*Tetracentron sinensis*, *Cryptocaria bhutanica*, *Engelhardtia spicata* etc) and suitable habitat for wildlife. Importantly, the cloud-zone serves as lifeline for the downstream by providing continuous flow of water in the form of streams and springs.

Similarly, along the inner dry valley slopes (Dochula-Lobesa series) that was carried out based on the quantitative vegetation data, climatic conditions, and observation on the presence of mosses and epiphytic vascular plants, the cloud-affected zone was defined as lying above 2500 m a.s.l. and coincided with the transition from moist broad-leaved forest to moist/wet broad-leaved forests. The cloud-zone moist humid oak-laurel forest changes to humid cool conifer forest towards the mountain tops, serving as a critical water source for the downstream community and for wildlife.



Schematic profile of the study area and Walter's climate diagram along with relative air humidity (RH %) for Phuntsholing (210 m a.s.l.), Darla (1750 m a.s.l.), Gedu (2000 m a.s.l.) and at 3100 m a.s.l. indicating the precipitation gradients along the humid slopes.

Humid cloud zone forest should be managed for water conservation as well as wildlife habitat. Further studies on mitigating negative impacts are recommended prior to any developmental activities in humid cloud forest.

Reference

Wangda, P and Ohsawa, M (2010). "Temperature and humidity as determinants of the transition from dry pine to humid Forests in Bhutan Himalaya", in Bruijnzeel, L.A. et al, (Eds), *Tropical Montane Cloud Forests: International Hydrology Series*, Cambridge University Press, Cambridge, pp. 156-163.

5.4 HCV 4: Ecosystem services



Definition

Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes.

5.4.1 Interpretation of key terms and concepts

Basic ecosystem services

Ecosystem services are the benefits people obtain from ecosystems such as:

- provisioning services such as food and water
- regulating services such as regulation of floods, reducing impacts of glacial lake outburst, land degradation, and disease
- cultural services such as recreational, spiritual, religious, and other nonmaterial benefits and
- supporting services such as soil formation and nutrient cycling.

The above ecosystem qualifies as HCV 4 when in critical conditions.

Maintaining healthy ecosystems is one of the National Key Result Areas of the country for the twelfth five-year plan. It aims to ensure sustainable ecosystem services which includes land, clean water, clean air, and ambient climate that are essential for sustaining life on the planet.

Critical situations

An ecosystem service is critical where a disruption of that service poses a threat of severe, catastrophic or cumulative negative impacts on the welfare, health or survival of local communities, on other HCVs, as well as on the functioning of important infrastructure (roads, dams, reservoirs, hydroelectric schemes, irrigation systems, buildings, etc.) due to the likely negative impacts on local community welfare and survival.



It may be useful to think about HCV 4 as supporting and regulating services in critical situations (see Table 4 *adapted from the Millenium Ecosystem Assessment, 2005*). *Supporting and regulating services contribute to HCV 4. Provisioning to human well-being and livelihoods (HCV 5) and Cultural ecosystems services contribute to cultural identity (HCV 6). Note that there are significant overlaps between some services e.g. water flow regulation and purification (HCV 4) and drinking water provision (HCV 5).*

TABLE 1: TYPES OF ECOSYSTEMS SERVICES (HCV common guidance)

HCV (in Critical Situations)	ECOSYSTEMS SERVICES	EXAMPLES OF ECOSYSTEM SERVICES
HCV4	SUPPORTING AND REGULATING	Flood regulation Water purification Climate regulation Disease regulation Genetic resources Soil formation Nutrient cycling Primary production
HCV5	PROVISIONING	Food Fresh water Wood and fibre Fuel
HCV6	CULTURAL	Aesthetic Spiritual Educational Recreational

In Bhutan, HCV 4 would be relevant to water quality and quantity, protection against soil erosion, prevention from flooding, and mitigating impacts of climate change that are specific to Bhutan like drying of water sources, environmental catastrophes associated with extreme rainfall events, and glacial lake outburst.

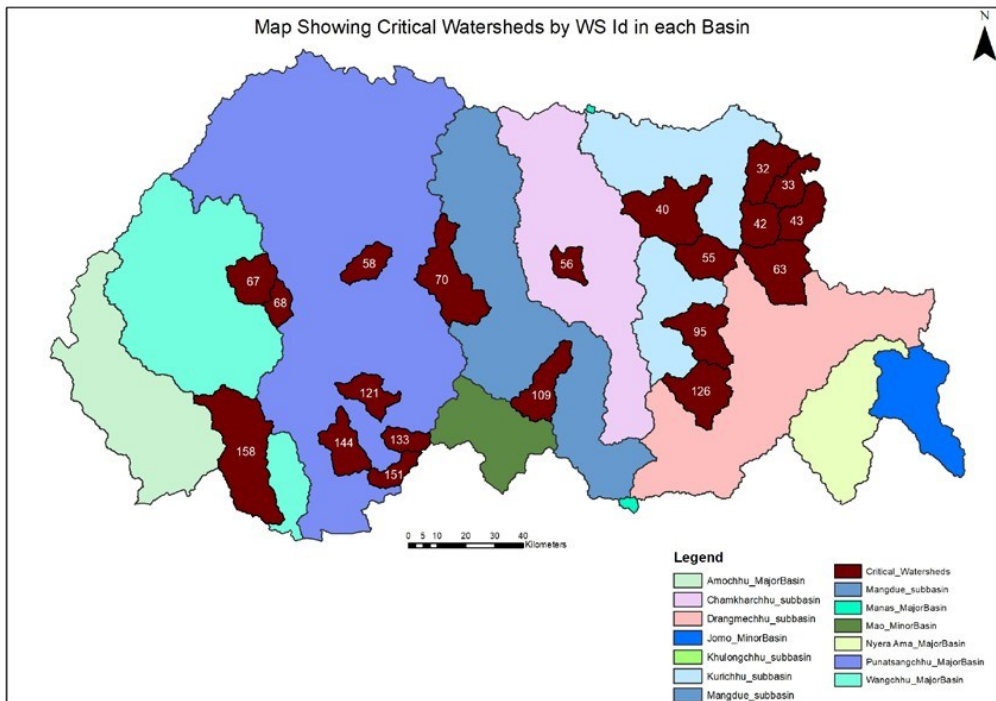
An area may be considered HCV 4 if it is protecting or providing one of these services in a critical situation. For example, a forest may provide a function in regulating the flow of water within a catchment. This service may be considered critical when people are dependent on the water for drinking or irrigation. Similarly, a forest area may provide a vital function in stabilizing slopes above a settlement. This service

may be critical when disturbing operations would lead to drastic soil erosion with impacts on people’s property or livelihoods. Basically, what defines the value is the existence of people who are making use of, or depend on, an environmental service.

Protection of water catchments

HCV 4 may apply to river and stream regulation in natural catchments where these water supplies are critical for human uses including drinking water, cooking, washing, irrigation and fishing, and there are no viable or readily available alternatives. These services can be disrupted by poor practices even in well-located production sites. Practically all activities on the terrestrial landscape will affect downstream freshwaters – it is just a matter of how much and how far.

A total area of 518,882 ha in Bhutan has been identified as critical watersheds in different basins. These are shown in the map given below.



Map 4: Critical watersheds in Bhutan (Bhutan water facts, WWF Bhutan)



WS_ID	Dzongkhag	Basin Name	Area_Ha
56	Bumthang	Chamkharchhu_subbasin	11100.11543
32	Tashi Yangtse	Khulongchhu_subbasin	25211.74092
33	Tashi Yangtse	Khulongchhu_subbasin	17423.17298
42	Tashi Yangtse	Khulongchhu_subbasin	19198.26628
43	Tashi Yangtse	Khulongchhu_subbasin	20576.47159
63	Tashi Yangtse	Khulongchhu_subbasin	38456.46591
40	Lhuentse	Kurichhu_subbasin	45524.96101
55	Lhuentse	Kurichhu_subbasin	23553.71035
95	Mongar	Kurichhu_subbasin	30629.71434
126	Mongar	Kurichhu_subbasin	32375.12866
70	Wangdue	Mangdue_subbasin	45125.96737
109	Zhemgang	Mangdue_subbasin	26372.66291
58	Wangdue	Punatsangchhu_MajorBasin	14658.17473
121	Tsirang	Punatsangchhu_MajorBasin	17502.43567
133	Tsirang	Punatsangchhu_MajorBasin	10996.81611
144	Dagana	Punatsangchhu_MajorBasin	22433.42911
151	Tsirang	Punatsangchhu_MajorBasin	11487.83225
67	Thimphu	Wangchhu_MajorBasin	22486.88649
68	Thimphu	Wangchhu_MajorBasin	10445.45592
158	Chukha	Wangchhu_MajorBasin	73322.53084
Total (Ha)			518,881.9389

Control of erosion of vulnerable soils and slopes

The steep and unstable condition of the terrain in Bhutan make it vulnerable to constant soil erosion. Landslides are common and this leads to gradual loss of soil fertility and land productivity. Some of the types of land degradation related to soil erosion and slopes with their possible causes and impacts in Bhutan are presented under table 2.

Table 2: Soil degradation, causes and impacts (Land degradation in Bhutan, Tshering Dorji et al)

Soil degradation	Possible causes	Impacts
Soil organic matter(OM) depletion	<ul style="list-style-type: none"> • No or inadequate application of organic fertilizers • Forest and grassland converted into arable land 	<ul style="list-style-type: none"> • Weakens soil structures • Reduces soil reserves of moisture and nutrients • Reduces crop yields and soil biodiversity
Soil nutrient depletion	<ul style="list-style-type: none"> • No or inadequate application of fertilizers • Leaching of nutrients • Erosion of fertile topsoil 	<ul style="list-style-type: none"> • Reduces crop yield • Acidification
Topsoil capping	<ul style="list-style-type: none"> • Insufficient organic fertilizers • Bare soils exposed to heavy rain 	<ul style="list-style-type: none"> • Reduces water infiltration • Increases runoff and surface erosion • Delays seedling emergence
Subsoil compaction	<ul style="list-style-type: none"> • Cattle grazing on irrigated fields • Repeated ploughing to the same depth 	<ul style="list-style-type: none"> • Increases surface runoff • Reduces infiltration • Increases risk of water logging
Gully erosion	<ul style="list-style-type: none"> • Unchecked rills • Logging and stock trails • Steep slopes • Deforestation • Overgrazing • High rainfall • Poor drainage system 	<ul style="list-style-type: none"> • Completely removes productive land • Gully head and side walls are vulnerable to landslips • Sediments reduce the capacity of reservoirs
Landslides	<ul style="list-style-type: none"> • Free faces, e.g., road cuttings, gully sides, etc. • Over-irrigation and other water-logging activities • Deforestation • Unstable soil and unstable underlying geology 	<ul style="list-style-type: none"> • Poses risk to lives of people and animals • Completely removes productive land • Destroys infrastructure • Sediments reduce the capacity of downstream reservoirs • Damages hydro-plants
Ravine formation	<ul style="list-style-type: none"> • Unchecked gullies and landslides • Unstable soil and underlying geology • Inappropriate land management practices • Deforestation • Overgrazing 	<ul style="list-style-type: none"> • Completely removes productive land • Secondary landslips may occur that enlarge ravine • Poses risk to lives of people and animals • Forces people to resettle elsewhere
Flooding	<ul style="list-style-type: none"> • High and intensive rainfall • Accentuated by upstream land clearance and erosion 	<ul style="list-style-type: none"> • Raw debris buries productive topsoil • Deposits easily re-eroded, by the river or wind



Since agriculture is the main occupation of the people of Bhutan, these impacts are devastating for farming communities. Therefore, the protection of HCV 4 is critical to the people to avoid these disasters.

5.4.2 Identification of HCV 4

Some of the indicators and data sources are given below to help in the identification of HCV 4. The assessor should not only depend on this information as it is not an exhaustive list. Other sources too must be explored.

Indicators	Information sources
Upstream of wetlands, water catchments that are important source of water supply for local and urban communities.	<ul style="list-style-type: none"> • A roadmap for watershed management in Bhutan, 2011 (DoFPS) • Sustainable land and integrated watershed management in Bhutan (UWICER) • Spring shed Assessment Report (Tarayana Foundation) • Wangchhu basin management plan, 2016 (DoFPS) • Bhutan water facts, 2018 (WWF Bhutan) • Watershed management plan, Buli, Zhemgang dzongkhag (2018-2023) (Zhemgang Dzongkhag) • Framework for National Wetland Inventory of Bhutan (DoFPS) • National Wetland inventory (WMD, DoFPS) • Mapping of Drying Water Sources and Revival (WMD, DoFPS) • Study of Climate Change impact on wetland ecosystem (RSPN) • Consultation with local communities on their water dependencies, and how water provisioning has changed over the recent past.
Steep slopes, fragile soils, or areas currently or in the future experiencing extreme rainfall events where the risk of catastrophic soil erosion is high. Including dryland areas susceptible to erosion.	<ul style="list-style-type: none"> • Climate Change Vulnerability Assessment Report, NAP (UNDP) • Drivers of Deforestation and Forest degradation Report (DoFPS) • National REDD+ Strategy (DoFPS)

Areas with poor water and air quality as monitored and reported by the NEC.	<ul style="list-style-type: none"> • Bhutan water facts, 2018 (WWF Bhutan) • Ecosystem Socio-economic Resilience Analysis and Mapping Technical Report 2022 (RSPN)
Degraded, disturbed and poor regeneration areas	<ul style="list-style-type: none"> • Drivers of Deforestation and Forest degradation Report (DoFPS) • National REDD+ Strategy (DoFPS)
Identified Payment for Ecosystem Services sites	<ul style="list-style-type: none"> • The Economics of Ecosystem and Biodiversity Report (UWICER & UNEP) • Community Perception of Ecosystem Services from FMUs and CFs (UWICER) • Valuation of Forest Ecosystem Services (WMD, DoFPS) • Ecosystem Socio-economic Resilience Analysis and Mapping Technical Report 2022 (RSPN)

Additional data sources would include:

- Laws, regulations and systems in place for management of water catchment areas and steep slopes. These include the Water Act of Bhutan 2011, Bhutan Water Vision and Bhutan Water Policy, Water Regulation of Bhutan 2014.
- Information from hydroelectric projects.
- Maps showing hydrology and topography, soil and vegetation, human habitations and infrastructure (such as transport routes, reservoirs, hydro dams).
- Consultations on water needs and its protection with local communities and management authorities.
- Views and recommendations of soil experts and hydrologists.
- Soil maps from Soil protection Centre, Ministry of Agriculture and Forests. Topographic maps from NLCS.
- Watersheds/catchment boundaries.



5.4.3 Examples of HCV 4

Burkhey, Sampheling Gewog, Chhukha Dzongkhag

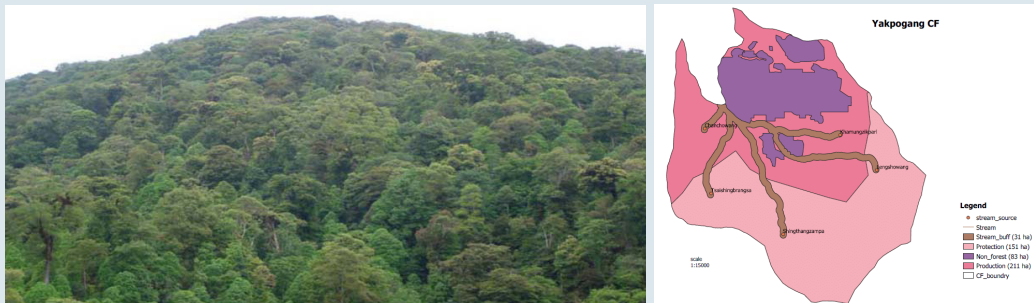


The 25 households of Burkhey village who are the members of the Burkhey Community Forest Management Group formed the Burkhey watershed management group in 2014. The modality they followed was based on the Payment for Environmental Services (PES) scheme. PES is being promoted as a means to recognize and reward upland land managers and communities for the provision of critical ecosystem services. Two springs exist at the bottom of Burkhey village under Sampheling gewog. Few private companies are reliant on this water. These companies include Druk cement, Tashi beverages, coca cola, Bhutan Board Products, Majur oxygen & Gas, etc. The protection of these two perennial springs is important for sustainable drinking water for these users. The Burkhey water management group were identified as the Environmental Service (ES) providers while the companies downstream have been identified as the ES buyers. Water is distributed equally from a reservoir tank and its PES fees paid annually. Besides other activities, tree plantation is undertaken to protect and support this ecosystem service.

5.4.4 Case study: Yakpugang Community Forests, Mongar

Yakpugang CF is the second CF established at Yakpugang of Mongar Geog in 2001. It is located seven kilometers from Mongar town. The area covers 260 hectares and is composed of cool broad leaf temperate forest extending from 800 to 3200 masl. In general, Yakpugang CF has a well-stocked forest, with Oak as the pre-dominant species. Communities from two villages (Yakpugang as the Primary Group with 42 households and Kilikhar as the Secondary Group with 61 households) manage this CF for catchment conservation and for sustainable supply of forest resources to the community. The Primary Group has full access to the CF while the Secondary Group has its access rights only for construction timber. The Yakpugang CF is the main source for water supply to the local communities of Yakpugang, Kilikhar and to the Mongar town. This forest also served as the main source for wood supply to the Mongar town until it was brought under CF management, which has halted forest exploitation by outsiders.

Since Yakpugang serves as the catchment area for water supply to Mongar township a Payment for Environmental Services (PES) scheme has been established. The PES scheme is based on a contractual agreement between the Yakpugang community forest management group as the service providers and the municipal authority of Mongar town as the service recipients. The Yakpugang community receives an annual payment from the municipal for managing the water catchment area. The water catchment is demarcated into different management zones; stream zone, protection zone, non-forest zone, and production zone as shown in the map below.



Yakpugang community forest and water catchment with PES scheme (Mongar Divisional Forest Office, 2021)

Reference

Norbu, U. P (2012). Benefit-sharing for ecosystem services with emphasis on poverty reduction. Watershed Management Division, Department of Forests and Park Services, Thimphu. <https://info.undp.org/docs/pdc/Documents/BTN/Benefit-Sharing%20PES%20Report%20draft%20Jul%2008082012.pdf>

Norten, U (2021) *Impact of water management strategies – Payment for Ecosystem services (PES) in Bhutan*. https://www.researchgate.net/figure/Yakpugang-community-forest-and-water-catchment-with-PES-scheme-Mongar-Divisional-Forest_fig3_356028683

Wangdi, R & Tshering, N (2006). *Is Community Forestry making a difference to rural communities? A comparative study of three community forests in Mongar Dzongkhag*. Ministry of Agriculture and Forests, Thimphu, Bhutan.

Watershed Management Division (2019 draft). *Assessment of the three functional payment of environmental services schemes*. WMD, Department of Forests and Park Services.



5.5 HCV 5: Community needs



Definition

*Sites and resources **fundamental for satisfying the basic necessities** of local communities or indigenous peoples (for livelihoods, health, nutrition, water), **identified through engagement with these communities or indigenous peoples.***

5.5.1 Interpretation of key terms and concepts

Fundamental for satisfying basic necessities

A site or resource is fundamental for satisfying basic necessities if the services it provides are irreplaceable (i.e. if alternatives are not readily accessible or affordable), and if its loss or damage would cause serious suffering or prejudice to affected stakeholders. Basic necessities in the context of HCV 5 may cover any or all of the provisioning services which form the basis of daily life such as food, fresh water, wood, and fuel. HCV 5 may occur where water supplies for rivers, streams and other natural water bodies are critical for human uses including drinking water, cooking, washing and irrigation, and there are no viable or readily available alternatives. The majority of the people in Bhutan are farmers heavily reliant on the natural resources for their sustenance. Agriculture being the predominant occupation is highly dependent on regular water supply for irrigation and drinking. Areas in Bhutan where crop cultivation is not possible it consists of pastoralists whose livelihood is completely reliant on herding Yaks.

Identified through engagement with communities

Although the definition refers to indigenous people in the Bhutan the term indigenous is synonymous to local communities. So, the term indigenous is not used. Local communities should play a key role in proposing and identifying potential HCVs through a participative process. When evaluating sites and resources as HCV 5, it is necessary to consult widely and ensure that participatory mapping and social surveys include representatives from minority, vulnerable and marginalized groups. Local communities need to be involved in a consultative process. In addition to local consultation, experts, local authorities and NGOs can provide helpful information

and context. Traditionally local communities’ participation in natural resource management in Bhutan has been quite active. Within the communities there are management regimes in place such as caretakers for the forests (*resup*) and water (*chhusup*).

Community dependence on the ecosystem services is well recognized and therefore their engagement is considered critical. A local development planning manual developed by the GNHC (2014) describes the annual process and basic techniques for local development planning.

5.5.2 Identification of the HCV 5

Some of the indicators and data sources are given below to help in the identification of HCV 5. The assessor should not only depend on this information, but other sources too must be explored, as it is not an exhaustive list.

Indicators	Information sources
<p>Local communities with a high degree of direct dependence on rivers and streams for their water supply, and natural resources for their basic needs but with limited availability of alternatives.</p>	<ul style="list-style-type: none"> • CF Strategy (DoFPS) • NWFP Strategy (DoFPS) • Socio-cultural values of ecosystem services from Oak Forest in Eastern Himalaya (UWICER) • Land use and land cover maps (NLC) • Community Perception of Ecosystem Services from FMUs and CFs (UWICER) • Valuation of Forest Ecosystem Services (WMD, DoFPS) • Impact of Cordyceps collection on Livelihood (UWICER) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan • Community Forestry in Bhutan 2011, (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo (SNV Bhutan) • Food & Nutrition Security Policy of Bhutan (MoAF)



<p>Livelihood of the local communities are based on subsistence scale activities.</p>	<ul style="list-style-type: none"> • NWFP Strategy (DoFPS) • Socio-cultural values of ecosystem services from Oak Forest in Eastern Himalaya (UWICER) • Land use and land cover maps (NLC) • Community Perception of Ecosystem Services from FMUs and CFs (UWICER) • Valuation of Forest Ecosystem Services (WMD, DoFPS) • Rangeland Areas of Bhutan 2017 (NRCAN, DoL, Bumthang) • The Fate of Traditional Rangeland Management Practices under Bhutan’s Changing Policies and Socio-economic Conditions, Kuenzang Tshering, Wu Ning, Karma Phuntsho, N. Chhetri, N. Bidha, K. Dema
	<ul style="list-style-type: none"> • Impact of Cordyceps collection on Livelihood (UWICER) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Community Forestry in Bhutan 2011 (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo (SNV Bhutan) • Food & Nutrition Security Policy of Bhutan (MoAF).
<p>There is little or no potable water, electricity, and sanitation infrastructure.</p>	<ul style="list-style-type: none"> • Community Perception of Ecosystem Services from FMUs and CFs (UWICER) • Valuation of Forest Ecosystem Services (WMD, DoFPS) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Food & Nutrition Security Policy of Bhutan, MoAF

<p>For those rural areas where firewood is used as the main source for cooking food.</p>	<ul style="list-style-type: none"> • CF Strategy, DoFPS • Socio-cultural values of ecosystem services from Oak Forest in Eastern Himalaya, Tshewang Dorji, UWICER • Community Perception of Ecosystem Services from FMUs and CFs, UWICER • Valuation of Forest Ecosystem Services, WMD, DoFPS • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Community Forestry in Bhutan 2011, (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo (SNV Bhutan) • Food & Nutrition Security Policy of Bhutan (MoAF)
<p>Houses and household tools are made from locally available traditional and natural materials.</p>	<ul style="list-style-type: none"> • CF Strategy (DoFPS) • Socio-cultural values of ecosystem services from Oak Forest in Eastern Himalaya (UWICER) • Community Perception of Ecosystem Services from FMUs and CFs (UWICER) • Valuation of Forest Ecosystem Services (WMD, DoFPS) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Community Forestry in Bhutan 2011, (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo (SNV Bhutan) • Study Of Typology of Bhutanese Rammed Earth Buildings, all volumes (DoC, MoHCA)



<p>People rely on food and NWFPs from the forest for a significant part of their diet.</p>	<ul style="list-style-type: none"> • NWFP Strategy (DoFPS) • Community Perception of Ecosystem Services from FMUs and CFs, (UWICER) • Valuation of Forest Ecosystem Services, (WMD, DoFPS) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Community Forestry in Bhutan 2011, (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo, (SNV Bhutan) • Food & Nutrition Security Policy of Bhutan, (MoAF)
<p>There is presence of permanent or semi-permanent pastoralists.</p>	<ul style="list-style-type: none"> • Land use and land cover maps (NLC) • Rangeland Areas of Bhutan 2017, (NRCAN, DoL, Bumthang) • The Fate of Traditional Rangeland Management Practices under Bhutan's Changing Policies and Socio-economic Conditions, Kuenzang Tshering, Wu Ning, Karma Phuntsho, N. Chhetri, N. Bidha, K. Dema
<p>Identified/designated community-based sustainable resource management</p>	<ul style="list-style-type: none"> • Land use and land cover maps (NLC) • Socio-cultural values of ecosystem services from Oak Forest in Eastern Himalaya, Tshewang Dorji, (UWICER) • Community Perception of Ecosystem Services from FMUs and CFs, (UWICER) • Valuation of Forest Ecosystem Services, (WMD, DoFPS) • Forest Policy and Income Opportunities from NTFP Commercialization in Bhutan, Phuntsho Namgyel • Community Forestry in Bhutan 2011, (UWICER, DoFPS) • Sustaining non-timber forest product in Bhutan: Case study on community-based management of Cane & Bamboo, (SNV Bhutan)
<p>Traditional and customary rights/practices</p>	<ul style="list-style-type: none"> • Reflections on Bhutanese Buddhist Environmental Narratives, Riamsara, Cambridge (PhD) • Impact of Cordyceps collection on Livelihood, (UWICER)

Additional data sources would include:

- Consultations with local communities as required in all the HCVs.
- Consultations and reports/data available with the gewog/dzongkhag (district), and other relevant NGOs and agencies working on community development activities.
- GIS analysis involving remote sensing data sets and other sources e.g. on location of NWFP resources, location of community water collection points, etc.
- Specialists and experts on sociology, ethnobotany, etc.
- Cadastral maps from NLCS that include all categories for various agriculture purposes.
- GIS mapping of human settlement from the Ministry of Works and Human Settlement.

5.5.3 Examples of HCV 5

Community Forests (based on high dependence on community livelihood)

The concept of Community forestry was introduced in Bhutan in 1992. Considering the dependency of the local communities on the forestry resources CFs have become popular with the communities. It has been increasing and presently there are 841 CFs covering more than 4% (as of May 2022) of the country's total geographical area. Community forestry has gained significance as rural communities become empowered to sustainably manage their natural resources. In addition to meeting forest product needs through good environmental stewardship, community forestry gives rural communities scope for income generation and poverty reduction through the marketing of timber, firewood, non-wood forest products and ecosystem services. Further, the good governance mechanism ensures equitable sharing of benefits and costs amongst the members of community forestry management groups. CFs play a critical role in satisfying the basic necessities of local communities and thus an important HCV 5 identified through engagement with these communities.



Berti community-based capture fish management, Trong gewog, Zhemgang

Traditionally fishing has been a means of livelihood and sustenance for the communities of Berti village consisting of 22 households. Recognizing this community need, the capture fishery program was established in the village in 2011. The major partners besides the Bertipas (communities) and Zhemgang Dzongkhag administration are Department of Livestock represented by the National Research Centre for Riverine & Lake Fisheries, and Department of Forests and Park Services represented by Jigme Singye Wangchuck National Park (JSWNP) and Zhemgang Divisional Forest office. While the DoL's objective is to enhance the socio-economic status of Berti through livestock related activities, the DoFPS aims to safeguard the sustainability of the concerned resource (fishery). The common fish species found are snow trout and chocolate masheer. Traditional fishing methods are used as shown in the pictures below made of cane and bamboo. The traps have been designed to allow for juvenile fishes to escape. Initial fishing area was approximately 10.18 Kms which included parts of the Bertichhu and Mangdechhu. However, after it was known that the critically endangered White-Bellied Heron was seen at Bertichhu it is now restricted for fishing. So presently fishing takes place in the Mangdechhu catchment area within an area size of approximately 5.7 kilometres. A management plan with by-laws has been prepared for ensuring the sustainable harvest of the fishes. When the traditional community needs are valued the local community in turn become the custodians of the resources. The social and ecological values are achieved.



Traditional fishing trap

Reference

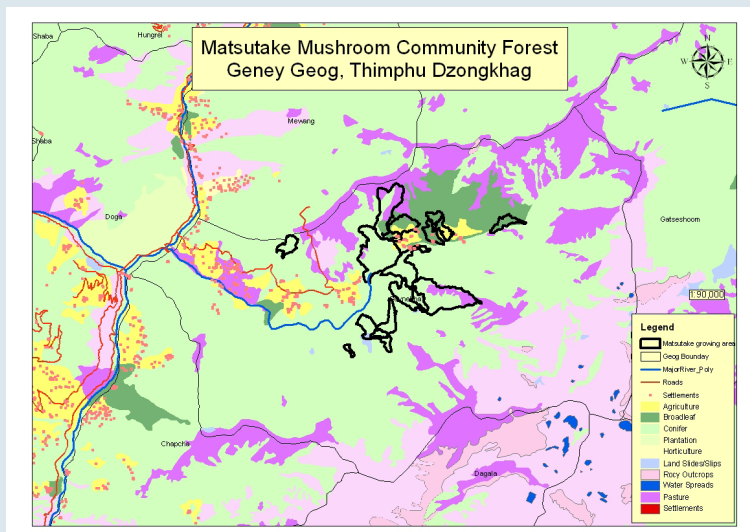
Ministry of Agriculture and Forests (2011). *Berti Capture Fishery Management Plan*, Berti village, Trong gewog, Zhemgang, National Warm Water Fish Culture Centre (NWWFCC), Gelephu, Bhutan.

5.5.4 Case study: Geney community mushroom management, Geney gewog, Thimphu.



The *Trocholoma mastsutake* mushroom management is an initiative undertaken by the community of Geney gewog as part of their community natural resource management. The group consists of 123 households to form the Geney Community Mushroom Management Group (GCMMG). It is

the main income source of the community. The increasing demand for the mushroom impacting on the unhealthy harvesting methods has made the community realize the threat of its disappearance, thereby, hampering the income of the community. Accordingly, the first management plan was developed in 2008 and subsequently the present management plan is being implemented for a period from 2019 to 2028. The objectives of Community Mushroom Management plan are, to prevent the mushroom growing area from forest fire and illegal harvesting, to generate the income through improved marketing of mushroom and accordingly enhance the livelihood of the members, to improve the productivity and quality through managing the habitat for consistent growth of mushroom and to build capacity at GCMMG level to effectively manage the forest for sustainable supply of mushroom. The economic value with the income generation from the sale of mushroom has encouraged the community to protect the overall health of the forest.



Reference:

Geney Community Mushroom Management Plan 2019 to 2029.



5.6 HCV 6: Cultural values



Definition

Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities and indigenous peoples.

5.6.1 Interpretation of key terms and concepts

The definition of HCV 6 being extremely broad is divided into two different categories i.e. cultural values of global or national significance, and values critical for local people at the site scale.

In the context of Bhutan, HCV 6 remains highly relevant. The cultural landscape is the foundation on what identifies Bhutan. The Bhutanese culture has evolved and remained vibrant through centuries. However, while Bhutan continues to uphold its cultural values it is becoming increasingly more challenging with rapid modernisation. Maintaining the vibrancy of intangible culture and preserving cultural structures remains the aspirations of the government while embracing modern development. The current programmes include sustenance and continuity of cultural heritage, enhancing spiritual values, promotion of national language and local indigenous languages, local government programme on preservation and promotion of culture and traditions. The principles and approach of HCV can be aligned to the preparation of management plan for important heritage sites especially the cultural site category (the cultural landscape approach).

Cultural Values of global or national significance

Sites, resources, habitats or landscapes which are significant at the global or national level are likely to have widely recognised historical, religious or spiritual importance and in many cases will have an official designation by national government or an international agency like United Nations Educational Scientific and Cultural Organization (UNESCO). Occasionally, new sites or resources of extraordinary cultural significance may be discovered through exploration of sites for development. The cultural heritage of Bhutan has been understood in two aspects, the tangible and

the intangible cultural heritage. The tangible cultural heritage is mainly interpreted in terms of heritage sites primarily categorized in following three forms:

- a. heritage buildings
- b. archaeological sites
- c. cultural sites

The intangible aspect is mainly the living tradition and customs (social, cultural, spiritual, etc.). As per the Cultural Heritage Bill 2016, the whole of Bhutan is recognized as a Cultural Landscape. The combination of tangible and intangible aspects requires an inclusive approach for protection and management of the cultural heritage. Registration and designation are important aspects used for better protection and management of cultural heritage of Bhutan.

Critical importance for the traditional cultures of local communities

HCV 6 represents areas of cultural significance that have traditional importance to local people. These may be religious or sacred sites, cremation/burial grounds or sites at which traditional ceremonies are performed. These are frequently well known by the local people, and some national laws require them to be identified and protected. The manager or assessor should consider whether existing laws are sufficient to safeguard the sites/areas.

The cultural heritage of Bhutan is known as ‘living heritage’ and the community forms the integral part for the continuity of the living aspect of our cultural heritage. The living tradition and customs of the communities are the very essence of our cultural heritage. The inclusive notion of cultural landscape or the cultural landscape approach is incomplete without the communities.

Therefore, in the Bhutanese context, HCV 6 comprises religious and/or cultural sites of significance, locally and/or nationally, identified through participation and in consultation with local people. Such living heritage sites are localised and site specific, and sometimes form the basis of community’s identity, history and spirituality.

5.6.2 Identification of the HCV 6

Some of the indicators and data sources are given below to help in the identification of HCV 6. The manager or assessor should not only depend on this information, but other sources too must be explored, as it is not an exhaustive list.



Indicators	Information sources
<p>Sites with official/proposed designation by national government and/or an international agency like UNESCO</p>	<ul style="list-style-type: none"> • GUARDIAN DEITIES of Dzongkhags (National Museum, Paro) • Study of Typology of Bhutanese Rammed Earth Buildings, all volumes (DoC, MoHCA) • Rinchengang Village (DoC, MoHCA) • Heritage Sites Journal Publications e.g., Archaeology of Bhutan, (DoC, MoHCA) • International Competition on Cultural Landscape in Bhutan 2014, (DoC, MoHCA) • Poverty And Social Impact Analysis of Bhutan’s Draft Heritage Sites Bill, (DoC, MoHCA) • Architectural Heritage Journal publications (DoC, MoHCA) • Survey On Historical Monuments in Wangduephodrang Dzongkhag (DoC, MoHCA) • Bhutan’s Heritage In Our Hands (DoC, MoHCA) • Proposal for UNESCO World Heritage sites and Man and Biosphere sites (DoFPS) • Nye Atlas (NLC) • Available GIS maps on cultural values (DoC, MoHCA)
<p>Sites with recognised and important historical or cultural values, even if they remain unprotected by legislation.</p>	<ul style="list-style-type: none"> • GUARDIAN DEITIES of Dzongkhags (National Museum, Paro) • Essential guide to sacred sites, Volume I-XIII, DoC, MoHCA • Rinchengang Village (DoC, MoHCA) • International Competition On Cultural Landscape In Bhutan 2014, (DoC, MoHCA) • Architectural Heritage Journal publications, (DoC, MoHCA) • Survey On Historical Monuments In Wangduephodrang Dzongkhag (DoC, MoHCA) • Bhutan’s Heritage In Our Hands () • Proposal for UNESCO World Heritage sites and Man and Biosphere sites (DoFPS) • Nye Atlas (NLC) • Available GIS maps on cultural values (DoC, MoHCA) • Hot springs and Mineral springs of Bhutan (UWICER)

<p>Religious or sacred sites, burial/cremation grounds or sites, forests, geological sites/formations at which traditional ceremonies take place that have importance to local people.</p>	<ul style="list-style-type: none"> • GUARDIAN DEITIES of Dzongkhags (National Museum, Paro) • Essential guide to sacred sites, Volume I-XIII (DoC, MoHCA) • Heritage Sites Journal Publications e.g. Archaeology of Bhutan (DoC, MoHCA) • International Competition On Cultural Landscape In Bhutan 2014 (DoC, MoHCA) • Poverty And Social Impact Analysis Of Bhutan’s Draft Heritage Sites Bill (DoC, MoHCA) • Architectural Heritage Journal publications (DoC, MoHCA) • Survey On Historical Monuments In Wangduephodrang Dzongkhag (DoC, MoHCA) • Bhutan’s Heritage In Our Hands (DoC, MoHCA) • Proposal for UNESCO World Heritage sites and Man and Biosphere sites (DoFPS) • Nye Atlas (NLC) • Available GIS maps on cultural values (DoC, MoHCA) • Hot springs and Mineral springs of Bhutan (UWICER)
<p>Strong traditional practices being retained by local communities.</p>	<ul style="list-style-type: none"> • GUARDIAN DEITIES of Dzongkhags (National Museum, Paro) • Essential guide to sacred sites, Volume I-XIII (DoC, MoHCA) • Poverty And Social Impact Analysis of Bhutan’s Draft Heritage Sites Bill (DoC, MoHCA) • Survey On Historical Monuments in Wangduephodrang Dzongkhag (DoC, MoHCA) • Bhutan’s Heritage in Our Hands (DoC, MoHCA) • Proposal for UNESCO World Heritage sites and Man and Biosphere sites (DoFPS) • Nye Atlas (NLC) • Available GIS maps on cultural values (DoC, MoHCA) • Hot springs and Mineral springs of Bhutan (UWICER)
<p>Unique landscapes with high aesthetic values</p>	<ul style="list-style-type: none"> • Rinchengang Village, (DoC, MoHCA) • Heritage Sites Journal Publications e.g. Archaeology of Bhutan, (DoC, MoHCA) • International Competition On Cultural Landscape In Bhutan 2014 (DoC, MoHCA) • Poverty And Social Impact Analysis of Bhutan’s Draft Heritage Sites Bill (DoC, MoHCA) • Survey On Historical Monuments In Wangdue Phodrang Dzongkhag (DoC, MoHCA) • Bhutan’s Heritage In Our Hands (DoC, MoHCA) • Proposal for UNESCO World Heritage sites and Man and Biosphere sites (DoFPS) • Nye Atlas (NLC)



Additional data sources would include:

- Inventory of registered and designated cultural sites of the Dzongkhags
- UNESCO World Heritage Sites and other relevant international reports to guide the national identification of sites and traditional practices.
- Strong engagement and consultations with local communities. Consultations also with expert groups which would include anthropologists, historians, archaeologists, cultural experts, museum authorities etc.
- Available GIS mapping of cultural values.
- Other cultural data or information available from museums, archaeology or Department of Culture.

5.6.3 Examples of HCV 6

Rinchengang village, Wangduephodrang



Rinchengang is a small village with a cluster of houses located above the highway on the opposite side of the Wangdue Phodrang dzong. The village is unique and of historical & cultural significance. It is one of the oldest villages in Bhutan. The settlement started with the stone masonry workers brought in from different parts of India and Nepal to

build the Wangdue Phodrang dzong. In the process the village was established permanently, and the masonry skills have been passed down from generation to generation.

Photo credit Heavenly Bhutan

Drapham Dzong, Archaeological site in Bumthang

The ruins of Drapham dzong sits at a strategic location in the centre of the Chokortoe valley in Bumthang. It was built in the 16th century to monitor the trade routes between Bhutan and Tibet. Excavation works at the site has revealed that the dzong is of similar size to the Wangdue Phodrang and Trongsa dzongs. The items found from the site has brought light to crucial discoveries of the past. Drapham dzong is the first ruined fortress in the country to be excavated.



Singye Dzong (Lion Fortress), Lhuentse

Singye dzong is one of the sacred places visited by Guru Rinpoche. It is located under Lhuentse dzongkhag, close to the Tibetan border. It falls within the Bumdeling Wildlife Sanctuary. It is believed that Khandro Yeshe Tshogyal, Guru's Rinpoche's consort discovered the dzong in the 8th century. The sacred site of Singye dzong has a total of eight dzongs which includes the Rinchen dzong, Tsemo dzong, Gawa dzong, Dhuelwa dzong, Dorji dzong, Namkha dzong and Pema dzong in addition to Singye dzong. Due to its sacredness, it is a very popular pilgrim site.



Ap Chundu soelkha, Jankakha, Haa

Ap Chundu is considered the protective deity of Haa valley. He is revered as the most powerful deity by the People of Haa (Haaps), who worship him and annually celebrate his birthday through a ritual called the Ap Chundu soelkha. It is celebrated in shamanistic tradition and the rituals involve a traditional *chipdrel* procession taking close to 4 hours and covers 10 km distance. Starting from the Lhakang Karpo, the procession ends at Jankhakha where a Yak is scarified to appease Ap Chundu.



5.6.4 Case study: Taktshang (Tigers nest), Paro

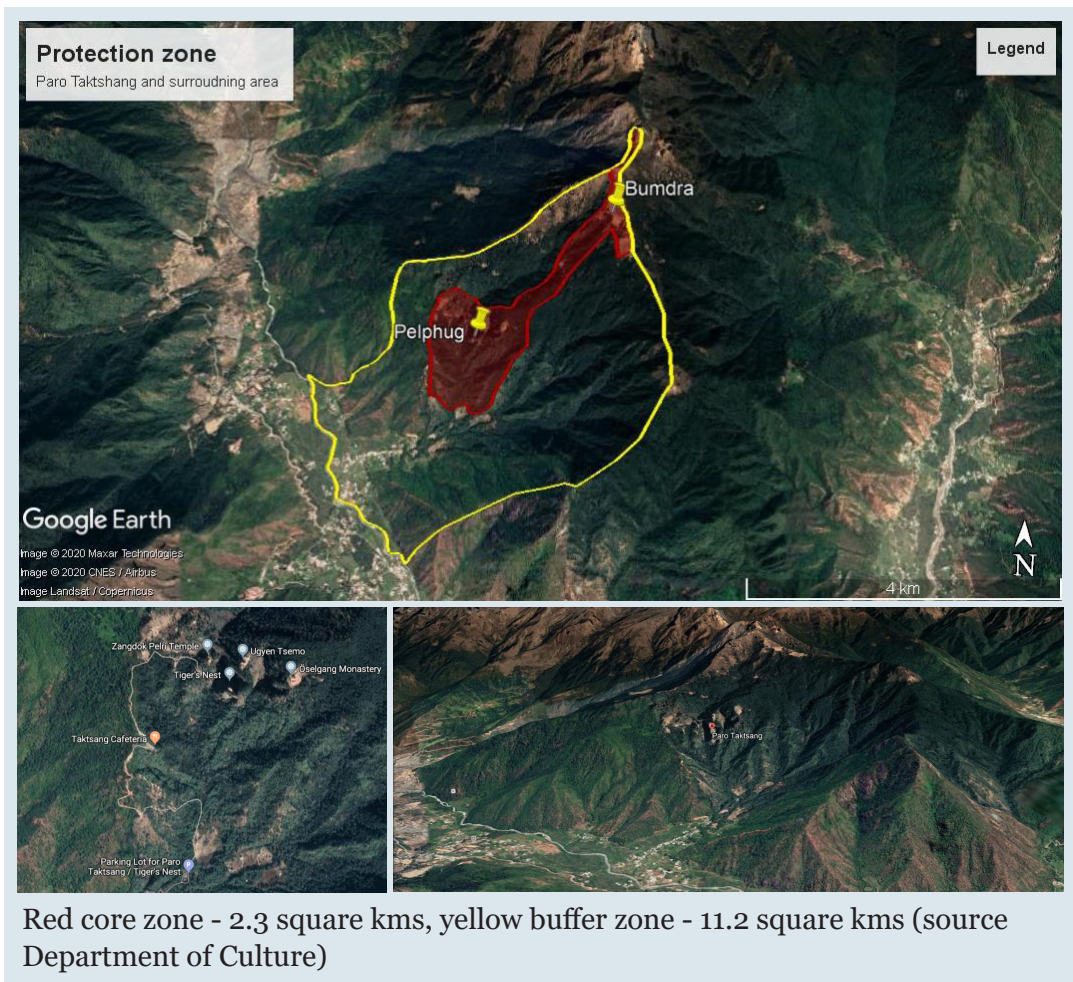


Taktshang Monastery is the most venerated cultural icon of Bhutan. Its significance dates back to the 8th century when it is believed that Guru Rinpoche came riding on a tigress to present day Taktshang Monastery. Thus, the name taktshang which translates as tiger's nest. Since the advent of Guru Rinpoche, the entire cliff is blessed by him and considered the holiest pilgrimage site for Buddhist. Apart from being the cultural hotspot for pilgrims it is also the most attractive and 'must see' site for tourists visiting Bhutan. Over the years Taktshang has gained global fame and has in fact become tantamount to introducing Bhutan. It is located 10 kilometres to the north of Paro town. The monastery sits on a precarious cliff at 3,120 m.a.s.l and is about 900 meters above the valley floor. The trail from the base is about 4 kilometres and takes about 2 hours hiking one way. As the most revered sacred site and popular tourist destination, it draws the maximum number of arrivals. Eight of the ten Lhakhangs (temples) in the monastery are open for visitation. Tourism brings substantial economic benefits to the local communities residing in the area.

Besides the cultural heritage of Taktshang, the landscape also encompasses ecological diversity and offers critical environmental services. The pristine conifer forests and subalpine vegetation act as critical watershed for the people living in the valley. The area has the potential to contain all the 6 categories of HCVs and therefore safeguarding the cultural and natural landscape will be of critical importance. Currently, the site has a management intervention proposed for Taktshang and its associated cultural sites. It is based on taking a landscape approach that is based on value-based protection. It prohibits felling of trees, mining activities, removal of plants, introduction of exotic species, feeding of wild animals, waste management and preventing forest fire. Zoning of the area has been initiated too.

Through the approach of HCV, the entire area can be designated as HCV site and this will certainly further complement the going efforts to conserve the values of this sacred site and offer continued benefits thereof.





6. Stakeholders

Stakeholders are critical for the success of adoption and implementation of the approach of HCVs in Bhutan. Stakeholder engagement or consultation is one of the key principles for the HCV approach. Recognizing its importance, it is vital to know, engage and use the relevant stakeholders and experts along with their field of expertise. Accordingly, their participation and engagement can lead to consensus and national ownership of the HCV approach, amongst other benefits. A profile of the relevant stakeholders in Bhutan is presented under table 3 along with their competency and appropriate HCV engagement. This list is to be used as a guide in ensuring that all relevant stakeholders are involved. However, this is not an exhaustive list but only indicative of potential stakeholders. At the time of identification, it is likely that other relevant stakeholders will emerge based on the assessment site.

Table 3: Stakeholders, their mandate and HCV relevance

Sl. No	Stakeholder/Expert and their mandate	HCV relevance
1	Department of Forests and Park Services https://www.moaf.gov.bt/about-dofps/ Conservation and sustainable management of the state reserve forests, soil, water resources and biodiversity of the country.	1,2,3,4,5,6
2	National Environment Commission http://www.nec.gov.bt/ It is the highest decision making and coordinating body on all the matters relating to the protection, conservation and improvement of the natural environment. Its mandate is to initiate, introduce and promote appropriate policies, programmes, legislation, institutions, reforms, activities and technologies that will strengthen environmental conservation in Bhutan.	1,2,3,4
3	National Land Commission Secretariat https://www.nlcs.gov.bt/ Apex body in the government to Manage, regulate and administer the ownership and use of land in the country.	1,2,3,4,5,6
4	Policy and Planning Division, Ministry of Agriculture and Forests https://www.moaf.gov.bt/ Develop plan, policies, standards and actions to ensure the sustainable social and economic well-being of the Bhutanese people through adequate access to food and natural resources.	1,2,3,4,5,6
5	National Biodiversity Centre https://www.moaf.gov.bt/about-nbc/ To ensure biological resources are effectively conserved, sustainably used and benefits equitably shared for enhancement of livelihood, food security and environmental well-being of the country.	1,2,3
6	Ugen Wangchuck Insititute for Environment and Conservation https://www.uwice.gov.bt/ Conduct, contribute and mainstream science and knowledge for promotion of environmental conservation.	1,2,3,4



7	<p>Royal Society for the Protection of Nature https://www.rspnbhutan.org/</p> <p>It is the only local environmental NGO in the country with the aim of contributing towards environmental conservation through sustainable natural resource management, environmental awareness, and enhancing environmental knowledge.</p>	1,2,3,4,5,6
8	<p>Bhutan Ecological Society https://bes.org.bt/</p> <p>A non-profit organization that connects science, business, and policy with the goal of building and sustaining resilient communities and functional landscapes.</p>	1,2,3,4
9	<p>Bhutan Birdlife Society http://bhutanbirdlifesociety.org/</p> <p>Bhutan Birdlife Society (BBLs) is a recently formed by conservation enthusiasts and experts focussing on the conservation of birds in Bhutan, protection of its habitats and Important Bird Areas (IBA) in the country. The society aims to promote interest in bird conservation to the general citizens, encourages research on birds thereby promoting bird watching in the country. It serves as the trusted agent providing accurate information regarding the status and distribution of birds in Bhutan.</p>	1,3
10	<p>Gross National Happiness Commission https://www.gnhc.gov.bt/en/</p> <p>To steer and guide the development of the country based on the principles of Gross National Happiness through consolidation and preparation of relevant plans, policies and standards.</p>	1,2,3,4,5,6
11	<p>Policy and Planning Division, Ministry of Works and Human Settlement</p> <p>https://www.mowhs.gov.bt/en/home-2/</p> <p>Formulate policies, develop plans, implement standards related to physical infrastructures and proper human settlement in the country. Promote research and development that would serve to maintain a synergy between technology, environment and traditional values.</p>	1,3
12	<p>Department of Culture https://www.mohca.gov.bt/?page_id=179</p> <p>Nodal agency within the government for realization of a harmonious and progressive society through preservation, protection, development and promotion of the shared ideals & values and the unique cultural identity and its expressions.</p>	5,6

13	Dratshang Lhentshog https://www.dl.gov.bt/ To Preserve and develop Bhutan’s rich spiritual heritage through the promotion of spiritual practices by maintaining the pristine nature of monastic discipline, practices and studies together with the standardization of monastic living amenities, encouraging monastic participation in public forums and expansion of Buddhist studies to higher levels.	5,6
14	Department of Local Governance https://www.dlg.mohca.gov.bt/ To promote and strengthen local governance; to coordinate development of the Local Government’s capacities; and to bolster the inter-governmental coordination.	5,6

7. Potential threats to the HCVs

The purpose of this section is to highlight the common threats on the HCVs for the managers and assessors to be aware and accordingly, appropriate measures can be put in place to address these threats. However, these threats are not exhaustive and other threats could be known during the process of field identification. Most of the threats are generic with few that may be specific to a particular HCV. Identification of threats for HCVs enables implementing appropriate interventions to maintain and/or enhance the values. Hence, identification of threats during the identification phase of HCV serves as precursor to the Management and Monitoring phase of HCV approach.

The threats include the following:

- Fragmentation of habitats and landscapes due to developmental and human activities. These activities would include construction of roads and infrastructure, land conversion, pollution and waste.
- Disturbance to the ecosystem caused by free range grazing by domestic animals.
- Conflicts between humans and wildlife such as elephants, monkeys, tigers, wild pigs, snow leopards, and bears constitute a major threat to the livelihood, food security and survival of sustenance farming communities.
- Uncoordinated efforts in resource management and development.
- Disturbance of migratory routes of birds and wildlife due to developmental activities.
- Unsustainable practices of over harvesting of NWFPs.



- Forest fire and natural disasters.
- Poaching of wild flora and fauna.
- Damages to cultural sites and infrastructure caused by natural calamities, developmental activities, and miscreants.

8. HCV Management and Monitoring

The HCV approach is a tool for maintaining critical environmental and social conservation values. Maintaining HCVs does not necessarily require setting-aside strict conservation areas, but rather managing the impacts from threats that would undermine the long-term viability or persistence of the identified conservation value. Therefore, following the identification of HCVs in an area, appropriate **management** prescriptions should be put in place based on an analysis of threats. **Monitoring** informs whether the management actions are effective (see Fig. 2) and is therefore part of the adaptive management cycle. The Common guidance for the management and monitoring of HCVs, provide a good practice guide for the adaptive management of the HCVs.

A management plan should include the following:

- What specific HCVs have been identified and where are they located in the area of interest and surrounding landscape.
- What are the specific management objectives, with specific and measurable management targets and metrics which will be used for monitoring
- What are the threats and how do these impact the identified HCVs. Threats can be both internal and external threats⁵.
- Consultation with stakeholders, to build consensus on the management strategies and activities. Where local communities are present, and where their rights or land uses are affected, they must be involved in this consultation, with management agreements developed following FPIC processes. This is also an opportunity to resolve conflicts between HCVs, e.g. management strategies to address cases of human-wildlife conflicts.
- Based on the findings of the above, HCV management areas are defined with an associated set of management actions to mitigate the threats and ensure HCV maintenance or enhancement.

⁵ Internal vs. external threats: Threats to HCVs can have internal sources, from the land managers own operations (e.g. road building, habitat fragmentation, pollution, conversion), or external sources (e.g. encroachment, illegal logging and hunting, poor governance)

Types of HCV **Management** areas include: strict conservation or no-go zones, production areas with limited use and specific rules on permitted activities, set-aside areas required by law, wildlife or ecological corridors, and community use areas. Within an area, such as a state production forest, there will often be a mix of these HCV management areas.

Finally, a **monitoring** regime should be established based on the management objectives of the management plan. The key purpose of monitoring is to ensure that the current management practices are effectively maintaining and/or enhancing the HCVs. Monitoring plans need to be designed based on management objectives. They should include a mix of operational, threat and strategic monitoring wherever relevant, with simple and measurable indicators, and thresholds for action that forms part of adaptive management.

Since this document focuses only on identification, the guidance document for HCV **management** and **monitoring** and case studies from Bhutan will be elaborated in the near future.

9. Way Forward

This guidance document has been developed with inputs and guidance from the NEG members and experts from the HCV Network. The HCV NI will be operationalized and implemented on the ground by developing an easy-to-use operational guidance document based on the lessons and experiences gained from piloting implementation of HCV NI in Paro Forest Division. The NI document will be a living document which will incorporate changes as it is being implemented.

Capacity building will be necessary to enhance the understanding and knowledge on the HCV identification process. Therefore, as part of implementing the project, further capacity building and skill up gradation mainly in the context of HCV will be pursued for all project landscape divisional staff.

HCV identification is only part of the process. The next steps include designing suitable management protocols for maintaining the identified values and implementation of monitoring procedures to ensure that the current management practices are effectively maintaining and/or enhancing the HCVs.



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Annexes

Annex 1: List of wild species protected by National Legislation, CITES listing and IUCN status (source Bhutan Biodiversity user list, NEC)

Species	National Legislation		IUCN Status
MAMMALS			
Arunachal Macaque (<i>Macaca munzala</i>)		II	Endangered
Asian Elephant (<i>Elephas maximus</i>)	FNCA & FNCRR	I	Endangered
Asian Golden Cat (<i>Catopumatemminckii</i>)		I	Near Threatened
Asian small-clawed Otter (<i>Lutra lutra</i>)		I	Vulnerable
Asiatic Black Bear (<i>Ursus thibetanus</i>)		I	Vulnerable
Binturong or Bearcat (<i>Arctictisbinturong</i>)			Vulnerable
Black musk deer (<i>Moschus fuscus</i>)		I/ II	Endangered
Blue sheep (<i>Ovis ammon hodgsonii</i>)	FNCRR	I	Least Concern
Brown Bear (<i>Ursus arctos</i>)		I/ II	Least Concern
Capped Langur (<i>Trachypithecus pileatus</i>)		I	Vulnerable
Clouded Leopard (<i>Neofelis nebulosa</i>)	FNCA & FNCRR	I	Vulnerable
Dhole (<i>Cuon alpinus</i>)		II	Endangered
Flying squirrel (Hylopetes alboniger)	FNCRR		Least Concern
Gaur (<i>Bos gaurus</i>)	FNCA & FNCRR	I	Vulnerable
Golden Langur (<i>Trachypithecus geei</i>)	FNCA & FNCRR	I	Endangered
Goral (<i>Naemorhedus goral</i>)		I	Near Threatened
Grey Langur (<i>Semnopithecus hector</i>)		I	Near Threatened
Grey Wolf (<i>Canis lupus</i>)		I/ II	Least Concern

Himalayan Black Bear (<i>Selenarctos thibetanus</i>)	FNCA & FNCRR	I	Vulnerable
Hispid hare (<i>Caprolagus hispidus</i>)	FNCRR		Endangered
Hog Deer (<i>Axis porcinus</i>)			Endangered
Leopard (<i>Panthera pardus</i>)	FNCA & FNCRR	I	Vulnerable
Leopard Cat (<i>Prionailurus bengalensis</i>)	FNCA & FNCRR	II	Least Concern
Marbled cat (<i>Pardofelis marmorata</i>)		I	Near Threatened
Musk Deer (<i>Moschus leucogaster</i>)	FNCA & FNCRR	I/II	Endangered
Pangolin (<i>Manis pentadactyla</i>)	FNCA & FNCRR	I	Critically Endangered
Pigmy Hog (<i>Sus sylvanicus</i>)	FNCA & FNCRR	I	Critically Endangered
Red Panda (<i>Ailurus fulgens</i>)	FNCA & FNCRR	I	Endangered
Rhino (<i>Rhinoceros unicornis</i>)	FNCRR	I	Vulnerable
Sambar (<i>Rusa unicolor</i>)	FNCRR		Vulnerable
Serow (<i>Capricornis sumatraensis</i>)	FNCA & FNCRR	I	Vulnerable
Sloth Bear (<i>Melursus ursinus</i>)		I	Vulnerable
Slow loris (<i>Nycticebus bengalensis</i>)	FNCRR	I	Vulnerable
Smooth-coated Otter (<i>Lutrogale perspicillata</i>)		II	Vulnerable
Snow Leopard (<i>Panthera uncia</i>)	FNCA & FNCRR	I	Vulnerable
Spotted deer (Cheetal) (<i>Axis axis</i>)	FNCA & FNCRR		Least Concern
Swamp deer (<i>Rucervus duvaucelii</i>)		I	Vulnerable
Takin (<i>Budorcas taxicolor</i>)	FNCA & FNCRR	II	Vulnerable
Tiger (<i>Panthera tigris</i>)	FNCA & FNCRR	I	Endangered
Wild Buffalo (<i>Bubalus arnee</i>)	FNCA & FNCRR	III	Endangered

Species	National Legislation	CITES Listing	IUCN Status
BIRDS			
Baer's Pochard (<i>Aythya baeri</i>)	FNCRR		Critically Endangered
Beautiful Nuthatch (<i>Sitta formosa</i>)	FNCRR		Vulnerable
Black Necked Crane (<i>Grus nigricollis</i>)	FNCA & FNCRR	I	Near Threatened
Black-necked Stork (<i>Ephippiorhynchus asiaticus</i>)	FNCRR		Near Threatened



Blyth's Kingfisher (<i>Alcedo Hercules</i>)	FNCRR		Near Threatened
Blyth's Tragopan (<i>Tragopan blythii</i>)	FNCRR	I	Vulnerable
Chestnut-breasted Partridge (<i>Arborophila mandellii</i>)	FNCRR		Vulnerable
Cinereous Vulture (<i>Aegypius monachus</i>)	FNCRR		Near Threatened
Dark-rumped Swift (<i>Apus acuticauda</i>)	FNCRR		Vulnerable
Eurasian Curlew (<i>Numenius arquata</i>)	FNCRR		Near Threatened
Ferruginous Duck (<i>Aythya nyroca</i>)	FNCRR		Near Threatened
Great Hornbill (<i>Buceros bicornis</i>)	FNCRR	I	Vulnerable
Great Slaty Woodpecker (<i>Mulleripicus pulverulentus</i>)	FNCRR		Vulnerable
Greater Spotted Eagle (<i>Clanga clanga</i>)	FNCRR		Vulnerable
Grey-crowned Prinia (<i>Priniacinereocapilla</i>)	FNCRR		Vulnerable
Himalayan Monal (<i>Lophophorus impejanus</i>)		I	Least Concern
Hodgson's Bushchat (<i>Saxicola insignis</i>)	FNCRR		Vulnerable
Eastern Imperial Eagle (<i>Aquila heliaca</i>)	FNCRR	I	Vulnerable
Japanese Quail (<i>Coturnix japonica</i>)	FNCRR		Near Threatened
Lesser Fish Eagle (<i>Ichthyophaga humilis</i>)	FNCRR		Near Threatened
Monal Pheasant (<i>Lophophorus impejanus</i>)	FNCA & FNCRR		Least Concern
Pallas's Fish Eagle (<i>Haliaeetus leucoryphus</i>)	FNCRR		Endangered
Peacock Pheasant (<i>Polyplectron bicalcaratum</i>)	FNCA & FNCRR		Least Concern
Peregrine Falcon (<i>Falco peregrinus</i>)		I	Least Concern
Raven (<i>Corvus corax</i>)	FNCA & FNCRR		Least Concern
Red-headed Vulture (<i>Sarcogyps calvus</i>)	FNCRR		Critically Endangered
River Lapwing (<i>Vanellus duvaucelii</i>)	FNCRR		Near Threatened

River Tern (<i>Sterna aurantia</i>)	FNCRR		Vulnerable
Rufous-Necked Hornbill (<i>Aceros nipalensis</i>)	FNCA & FNCRR	I	Vulnerable
Rufous-throated Wren Babbler (<i>Spelaeornis caudatus</i>)	FNCRR		Near Threatened
Tibetan snowcock (<i>Tetraogallus tibetanus</i>)		I	Least Concern
Ward's Trogon (<i>Harpactes wardi</i>)	FNCRR		Near Threatened
Wedge-billed Wren Babbler (<i>Sphenocichla humei</i>)	FNCRR		Near Threatened
White-bellied Heron (<i>Ardea insignis</i>)	FNCRR		Critically Endangered
White-rumped Vulture (<i>Gyps bengalensis</i>)	FNCRR		Critically Endangered
White-tailed eagle (<i>Haliaeetus albicilla</i>)		I	Least Concern
Wood Snipe (<i>Gallinago nemoricola</i>)	FNCRR		Vulnerable
Yellow-rumped Honeyguide (<i>Indicator xanthonotus</i>)	FNCRR		Near Threatened

Species	National Legislation	CITES Listing	IUCN Status
FISHES			
<i>Aborichthys garoensis</i>			Vulnerable
<i>Cirrhinus cirrhosis</i>			Vulnerable
<i>Cyprinion semiplotum</i>			Vulnerable
<i>Cyprinus carpio</i>			Vulnerable
<i>Devario assamensis</i>			Vulnerable
<i>Pseudecheneis sirenica</i>			Vulnerable
<i>Schistura inglisi</i>			Vulnerable
<i>Schizothorax richardsonii</i>			Vulnerable
Golden Mahseer (<i>Tor putitora</i>)	FNCA & FNCRR		Endangered
<i>Pterocryptis barakensis</i>			Endangered
<i>Clarias magur</i>			Endangered



Species	National Legislation	CITES Listing	IUCN Status
BUTTERFLY			
Bhutan Swallowtail (<i>Bhutanitis ludlowi</i>)	FNCRR	II	Endangered

Species	National Legislation	CITES Listing	IUCN Status
FUNGI			
<i>Ophiocordyceps sinensis</i>	FNCA & FNCRR		Vulnerable

Species	National Legislation	CITES Listing	IUCN Status
AMPHIBIANS AND REPTILES			
<i>Chitra indica</i>			Endangered
<i>Cuora amboinensis</i>			Vulnerable
<i>Cuora mouhotii</i>			Endangered
<i>Gavialis gangeticus</i>		I	Critically Endangered
<i>Geoclemys hamiltonii</i>			Vulnerable
<i>Hardella thurjii</i>			Vulnerable
<i>Indotestudo elongate</i>		II	Endangered
<i>Kachuga dhongoka</i>			Endangered
<i>Kachuga kachuga</i>			Critically Endangered
<i>Melanochelys tricarinata</i>		I	Vulnerable
<i>Morenia petersi</i>			Vulnerable
<i>Nilssonia hurum</i>			Vulnerable
<i>Oligodon juglandifer</i>			Vulnerable
<i>Ophiophagus hannah</i>		II	Vulnerable
<i>Pangshura sylhetensis</i>			Endangered
<i>Python bivittatus</i>			Vulnerable
<i>Python molurus</i>			Vulnerable
<i>Xenophrys cf. nankiangensis</i>			Vulnerable
<i>Varanus bengalensis</i>		I	Least Concern

Species	National Legislation	CITES Listing	IUCN Status
PLANTS			
<i>Aglaiia perviridis</i>			Vulnerable
<i>Androsace hemisphaerica</i>			Endangered
<i>Aquilaria malaccensis</i>	FNCA & FNCRR	II	Critically Endangered
<i>Astragalus paroensis</i>			Critically Endangered
<i>Bambusa clavate</i>			Vulnerable
<i>Bistorta griersonii</i>			Endangered
<i>Buddleja bhutanica</i>			Vulnerable
<i>Bulbophyllum leopardinum</i> var. <i>tuberculatum</i>		II	Critically Endangered
<i>Bulleyia yunnanensis</i>			Endangered
<i>Carex nigra</i> subsp. <i>drukylulensis</i>			Endangered
<i>Ceropegia bhutanica</i>			Endangered
<i>Ceropegia dorjei</i>			Critically Endangered
<i>Cheirostylis sherriffii</i>			Critically Endangered
<i>Corallodiscus cooperi</i>			Vulnerable
<i>Cupressus macrocarpa</i>			Vulnerable
<i>Cycas pectinate</i>		II	Vulnerable
<i>Cymbopogon bhutanicus</i>			Vulnerable
<i>Cypripedium cordigerum</i>		II	Vulnerable
<i>Cypripedium elegans</i>		II	Endangered
<i>Cypripedium himalaicum</i>		II	Endangered
<i>Drepanostachyum annulatum</i>			Vulnerable
<i>Gentiana crassuloides</i>	FNCA & FNCRR		
<i>Hoya bhutanica</i>			Endangered
<i>Hypericum sherriffii</i>			Endangered
<i>Ilex venulose</i>			Endangered
<i>Illicium griffithii</i>			Endangered
<i>Isodon atroruber</i>			Endangered
<i>Jacaranda mimosifolia</i>			Vulnerable
<i>Lloydia yunnanensis</i>	FNCA & FNCRR		



<i>Malaxis muscifera</i>			Vulnerable
<i>Meconopsis bhutanica</i>			Critically Endangered
<i>Meconopsis grandis</i>	FNCA & FNCRR		
<i>Meconopsis superba</i>			Endangered
<i>Nardostachys jatamansi</i>			Critically Endangered
<i>Neopicrorhiza minima</i>			Endangered
<i>Onosma griersonii</i>			Critically Endangered
<i>Ophiorrhiza longii</i>			Critically Endangered
<i>Oreorchis sanguinea</i>			Critically Endangered
<i>Panax pseudo-ginseng</i>	FNCA & FNCRR		
<i>Paphiopedilum fairrieianum</i>		I	Critically Endangered
<i>Paphiopedilum spicerianum</i>			Endangered
<i>Paphiopedilum venustum</i>		I	Endangered
<i>Pedicularis griniformis</i>			Vulnerable
<i>Pedicularis sanguilimbata</i>			Endangered
<i>Picea brachytyla</i>			Vulnerable
<i>Rhododendron dalhousiae</i> var. <i>rhabdotum</i>			Vulnerable
<i>Saurauia punduana</i>			Critically Endangered
<i>Saxifraga vacillans</i>			Vulnerable
<i>Sorbus lingshiensis</i>			Critically Endangered
<i>Sorbus rinzenii</i>			Endangered
<i>Strobilanthes accrescens</i> subsp. <i>Accrescens</i>			Endangered
<i>Taxus baccata</i>	FNCA & FNCRR		Least Concern
<i>Taxus wallichiana</i>		II	Endangered

Annex 2: Members of the HCV National Expert group

Sl. No.	Member	Organization
1	Mr. Kinley Tshering (Chairperson), Chief Forestry Officer	FPED, Department of Forests and Park services (DoFPs)
2	Ms. Sonam Peldon (Deputy Chairperson), Principal Forestry Officer	SFED, DoFPS
3	Ms. Pema, Chief Architect	Department of Culture
4	Mr. Chokila, Deputy Chief Survey Engineer	National Land Commission Secretariat
5	Ms. Pema Yangzom, Deputy Chief Survey Engineer	National Land Commission Secretariat
6	Ms. Tshering Zam, Senior Forestry Officer	NCD, DoFPs
7	Mr. Tashi Norbu Waiba, Deputy Chief Forestry Officer	FRMD, DoFPs
8	Ms. Karm Uden, Program Manager	Tarayana Foundation
9	Dr. Norbu Wangdi, Project Coordinator	Royal Society for the Protection of Nature
10	Ms. Nagdrel Lhamo, Practice Lead, Forests and Wildlife Practice	WWF Bhutan
11	Ms. Kezang Yangden, Practice Lead, Climate and Energy Practice	WWF Bhutan
12	Mr. Karma Tenzin, Monitoring & Evaluation Officer	WWF Bhutan
13	Mr. Younten Phuntsho (member secretary), Program Coordinator	WWF Bhutan



OUR MISSION IS TO CONSERVE NATURE AND REDUCE THE MOST PRESSING THREATS TO THE DIVERSITY OF LIFE ON EARTH



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