MAKALU BARUN NATIONAL PARK AND ITS BUFFERZONEMANAGEMENT PLAN FY 2076/77-2080/81

Government of Nepal
Ministry of Forests and Environment
Department of National Parks and Wildlife Conservation
MAKALU BARUN NATIONAL PARK
Seduwa, Sankhuwasabha

Makalu Barun National ParkandIts Buffer Zone
Management Plan

Fiscal Year 2076/77-2080/81

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Publisher:

Makalu Barun National Park Office, Seduwa, Sankhuwasbha, Nepal.

Citation:

MBNP 2018. Makalu Barun National Park and its Buffer Zone Management Plan, FY 2076/77 – 2080/81

Makalu Barun National Park, Seduwa, Sankhuwasbha, Nepal.

FOREWORD

Makalu Barun National Park was established in 1991, with the aim of conserving unique biodiversity in the Eastern Himalayan Region of Nepalalong with endangered wildlife species, majestic landscape and local culture of the Makalu region. This park has a diverse altitudianal variation from 435 m to 8463 m, which has made this park a repository of biological diversity and natural beauty.

Our Park staff and security personnel of Nepal Army play a vital role in conserving biological diversity, supporting social and economic development of Buffer Zone communities, promoting and enhancing visitor experience and ensuring that biodiversity is conserved and enhanced for future generations. Success of the Park relies on close and effective partnership with Buffer Zone communities. The first management plan of the MBNP was prepared in 2008 with a main focus on buffer zone. This plan is the outcome of rigorous review of the first plan (2008-2012) and wider consultations with concerned and varied stakeholders having responsibilities of contribution for the management, protection and wise use of tangible and intangible resources of the Park. So, it is not only a plan for Park authority, but also a plan for all the stakeholders and many organizations and individuals who have crucial role in managing and caring for this precious and fragile landscape.

This five-year plan has been produced as an outcome of hard work of management plan preparation team and I would like to acknowledge the support extended by conservation partners, professionals, practitioners, conservation communities and service provider.

Finally, I would like to thank all the individuals, organizations and stakeholders who extended their support and cooperation to bring this document to this final stage. At this juncture, I would like to request all the concerned stakeholders in joining hands in translating the vision of this plan into meaningful action.

Gopal Praksh Bhattarai
Director General

ACKNOWLEDGEMENT

The management plan has been completed with the collective effort of many individuals and organizations. This accomplishment would not have been possible without their sincere support and honest help at both the local and national level.

First of all, I would like to express my sincere gratitude to Director General Mr. Gopal Prakash Bhattarai for his relentless guidance, encouragementand support. This management plan has been extensively reviewed for which I sincerely thank Deputy Director General Dr. Ram Chandra Kandel and Mr. Yubraj Regmi, former DG Man Bahadur Khadka and Protected Area Management Expert Mr. Shyam Bajimaya. I am extremely grateful to Mr. Manoj Kumar Shah, then Chief Conservation Officer of MBNP for his tireless efforts in initiating and leading the process to prepare this updated plan.

I am deeplyindebted toManagement Officer (Under Secretary) Mr. Narayan Rupakheti, Planning Officer (Under Secretary) Amir Maharjan, Assistant Management Officer Mr. Bishnu Prasad Thapaliya and Mr. Santosh Kumar Bhagat and for invaluable assistance from the DNPWC.

The untiring effort of Mr. Jhamak Bahadur Karki and his team from Biodiversity and Ecological Services Centre Pvt LTD (BESC) in this plan preparation which includes field level interaction, write up, analysis, central level interaction and finalizing is praiseworthy and therefore, I would like to express my sincere thanks to them. Many thanks toEnvironmental and Development Research Center for conducting IEE and Mr. Bhola Nath Dhakal for preparing necessary maps.

I would like to extend my sincere thanks to all the 12 BZMC chairpersons and the members for providing valuable suggestions. I also wish to thank all the field respondents and members who participated in BZUC's five-year plan preparation process for their lively interaction and assistance in the process of preparing this plan.

Last but not least, special appreciation goes to all my colleagues of MBNP, especially Assistant Conservation Officers Mr. Sanjeeb Gupta and Makunda Sanjel for facilitating UC level plan preparation process and all other office staffs for their involvement during the preparation phase. I want to remember Ranger Mr. Manjit Bista for his invaluable contribution to prepare this report.

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Chandra Shekhar Chaudhary

Chief Warden

Makalu Barun National Park

EXECUTIVE SUMMARY

Makalu Barun National Park (MBNP) was established in Nov. 18, 1991 to conserve and maintain the unique biological and cultural values, and scenic beauty of the park's landscape for the benefit of the present and future generations. The main objective of MBNP and its Bufer zone (BZ) management is to enhance biodiversity of the park, promote ecotourism and regulate it to maintain balance between conservation and tourism and also support livelihoods of local community through effective management of natural and cultural heritage.

The wide range of bio-climatic variation along the elevation gradient of 40-50 km harbors as many as 27 forest types from upper tropical to nival zones, which provide array of forest ecosystem services, flora and fauna. The Park area supports 20 types of forest ecosystems and 12 vegetation types.So far 88 species of mammals, 433 species birds, 43 species of reptiles, 16 species of amphibians, 315 species of butterflies, and 13 species of fish have been reported from the MBNP & BZ.

The park is a home to someof the endangered wildlife species including snow leopard, musk deer and red panda. The areacontains the world's highest ecologically characteristic flora and fauna, intricately blended withthe rich Rai, Gurung, Bhote and Sherpa culture. The BZ of MBNP was declared on Feb 10, 1999 (Magh 25, 2055 BS) to ensure people's participation in conservation. The buffer zone comprises 7680 households with a population of 36,395 (approximately) and is spread over parts of four rural municipalities (3 in Sankhuwasabha and 1 in Solukhumbu district). The ethnic composition is dominated by Rai (64%) followed by Singhashava Bhote (18%), Sherpa (8%) and others (10%). In order to institutionalize participatory conservation and development practices inthe buffer zone, the local communities are organized into 95 Buffer Zone User Groups (BZUGs), twelve Buffer Zone User Committees (BZUCs) and one Buffer Zone Management Committee(BZMC).

MBNP is gradually becoming one of the tourist destinations in Nepal. Tourism is the major sourceof income, which not only benefits the local communities, but also generates significantamount of revenue for the country. MBNP at present faces several challenges which need to beaddressed carefully for maintaining the delicate balance between biodiversity conservation, tourism promotion and livelihood enhancement of the local communities. The park protection, management of the key wildlife habitats, sustainable tourism and infrastructure development, garbage management, glacial lake outburst flood risk and the livelihood enhancement of thelocal communities have been identified as the major issues of concern. This management planis expected to address most of these pertinent issues.

The current Management Plan 2076/77- 2080/81 is the continuation of the previous management plan of the MBNP and its BZ. It is developed through numerous interactions and consultation meetingswith stakeholders, field works and observations, central and local-level workshops followedby expert review. The plan has been prepared for conservation, management and utilizationof the park and its buffer zone resources in scientific and participatory approach. The

objective of MBNP and itsBZ management is to enhance biodiversity of the park, promote and regulate tourismto maintain delicate balance between conservation and tourism and also supportthe livelihoods of the local communities through effective management of the natural andcultural heritages. The specific objectives are:

- To conserve biodiversity of the park with special focus on nationally protected and globally threatened wildlife species and their habitats in order to maintain ecological functions andprocesses;
- To promote sustainable tourism, and regulate it for maintaining ecological integrity and cultural heritage;
- To enhance community stewardship on biodiversity conservation by increasing awareness, and improving livelihood of the people living in the BZ; and
- To strengthen institutional capacity through research, capacity building, coordination and collaboration.

The broad thematic areas incorporated in the management plan are protection and conservation of biodiversity, habitat management, tourism and interpretation, BZ management and research, monitoring and capacity building. Special programmes on species conservation have also been formulated focusing on snow leopard, musk deer, Himalayan black bear, red panda and pangolin. The plan also attempts tomanage the park in the face of likely impacts of climate change in order to enhance the resilience of the local communities living in the BZ.

The total budget for the implementation of the plan is estimated to be Rs. 62,34,44,882 (equivalent to 55,49,763 US$) excluding operation costs. The plan gives much weightage to Park protection followed by tourism development, which are around 54 % and 24 % respectively. The next priority is given to research, monitoring and capacity building with about 8 % of budget allocated. Government allocated budget is only 24 % on an average, and this plan envisages the need of partnership from conservation partners to fulfill the gap of remaining 76 %.

The budget of BZ is considered as per the current available budget from GoN and conservation partners. The budget of all the BZUCs is NRs. 16,13,56,000.00 (Sixteen Crore Thirteen Lakh Fifty Six Thousand).The budget focuses mainly in conservation, community development, skill development and income generation, and conservation awareness. The BZUCs are expected to pool the resources from local GoN to implement the activities.

The implementation of the activities prescribedin this plan is expected to enhance the conservation of biodiversity in this region, promote tourism for improvement of the living standardof the local communities, and enrich the capacity of MBNP staff and BZ communities. On theother hand, it is estimated that 3,57,179 man days of employment will be generated in thisregion through implementation of the activities prescribed by the management plan which isexpected to contribute for enhnancing the livelihood of the local communities.

सारांश

सन् १९९१ (वि.सं. २०४८) सालमा स्थापना भएको मकालु वरुण राष्ट्रिय निकुञ्ज नेपालको एउटा अग्रणी संरक्षित क्षेत्र हो । यो राष्ट्रिय निकुञ्ज समुद्री सतहबाट ४३५ मि. उचाइदेखि ४० कि.मि. उत्तर दक्षिण दूरीभित्रै ८,४६३ मि. अग्लो विश्वको पाँचौं अग्लो हिमाल मकालु हिमशिखरसम्म फैलिएको छ । यसलाई बृहत् सगरमाथा पारिस्थितिकीय प्रणालीको एउटा महत्वपूर्ण अङ्ग मानिएको छ । यसको पश्चिममा सगरमाथा राष्ट्रिय निकुञ्ज र उत्तरमा चीनको स्वशासित क्षेत्र तिब्बतको चोमोलोङ्मा प्रकृति संरक्षण क्षेत्र पर्दछन् । यो निकुञ्ज Sacred Himalayan Landscape जैविक मार्गको हिसाबले पूर्वमा कंचनजंघा संरक्षण क्षेत्र र गुराँसको राजधानी मानिने मिल्के जलजले क्षेत्रसँग जोडिएको छ । भिरालो भू-बनोट तथा पूर्वी हिमालयको भारी मनसूनी वर्षाले (१००० देखि ४००० मि.मि. प्रतिवर्ष) यो निकुञ्ज असाधारण जैविक विविधता तथा जडिबुटी र वनस्पतिहरूको भण्डारको रूपमा रहेको छ । यो राष्ट्रिय निकुञ्ज हिउँ चितुवा, कस्तुरी मृग, हिमाली कालो भालु, हाब्रे, कालो सालक लगायतका दुर्लभ एवं महत्वपूर्ण वन्यजन्तुहरुको बासस्थान हो ।सन् १९९९ (वि.सं. २०५५) मा संखुवासभा जिल्लाका १० वटा गा.वि.स. र सोलुखुम्बु जिल्लाका २ वटा गा.वि.स. को अधिकांश भू-भाग समेटेर मकालु वरुण राष्ट्रिय निकुञ्जको मध्यवर्ती क्षेत्र घोषण गरिएको हो । मध्यवर्ती क्षेत्र भित्र रहेका ७६८० घरधुरीहरुमा करीब ३६३९५ मानिसहरु बसोबास गर्दछन् । मध्यवर्ती क्षेत्रमा सहभागितामूलक संरक्षण र विकासको अभ्यासलाई संस्थागत गर्नको लागी स्थानिय समुदायलाई ९५ वटा मध्यवर्ती क्षेत्र सामुदायिक वन उपभोक्ता समूहहरुमा आवद्ध गरी १२ वटा मध्यवर्ती क्षेत्र उपभोक्ता समितिहरु र एउटा मध्यवर्ती क्षेत्र व्यवस्थापन समिति गठन गरिएको छ । यस राष्ट्रिय निकुञ्जले भोटे, राई, शेर्पा लगायतका जातिहरूको सांस्कृतिक र धार्मिक सम्पदाको संरक्षणमा योगदान पुऱ्याएको छ ।

मकालु वरुण राष्ट्रिय निकुञ्ज पर्यटकहरुको गन्तव्यको रुपमाविकसित हुदै गइरहेको छ । पर्यटन व्यवसाय यस क्षेत्रका स्थानिय समुदायको लागी आम्दानीको स्रोत मात्र नभई राष्ट्रकै लागी राजश्वको स्रोतको रुपमा रहेको छ । मकालु वरुण राष्ट्रिय निकुञ्जमा जैविक विविधता संरक्षण, पर्यटन प्रवर्द्धन तथा स्थानिय समुदायको जिविकोपार्जनलाई सन्तुलित रुपमा अगाडि बढाउनको लागी विविध चुनौतिहरु विद्यमान रहेका छन् । उल्लेखित सन्दर्भमा निकुञ्जको संरक्षण, महत्वपूर्ण वन्यजन्तुहरुको बासस्थान व्यवस्थापन, दिगो पर्यटन प्रवर्द्धन, आवश्यक भौतिक पूर्वाधारहरुको विकास, फोहोरमैला व्यवस्थापन, हिमताल विष्फोटनको जोखिम तथा स्थानिय समुदायको जिविकोपार्जन सुधारलाई मुख्य सवालहरुको रुपमा पहिचान गरिएको छ । यस व्यवस्थापन योजनाले यी अधिकांश सवालहरुलाई सम्बोधन गर्ने अपेक्षा गरिएको छ ।

मकालु वरुण राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको व्यवस्थापन योजना २०७६ /७७-२०८०/८१, विगतका व्यवस्थापन योजनाहरुको निरन्तरता हो जसलाई सरोकारवालाहरुसंगको अन्तर्क्रिया, छलफल, स्थलगत अवलोकन, उपभोक्ता समिति स्तरीय बैठक समेतबाट तयार गरिएको मस्यौदालाई विज्ञहरुबाट पुनरावलोकन गराई अन्तिम रुप दिईएको छ । यो व्यवस्थापन योजना मकालु वरुण राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रमा रहेको स्रोतहरुको वैज्ञानिक एवं सहभागितामुलक पद्दतिबाट संरक्षण, व्यवस्थापन र दीगो उपयोग गर्नको लागी तयार गरिएको हो । मकालु वरुण राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्र

व्यवस्थापनको मुख्य उद्देश्य यस क्षेत्रको प्राकृतिक तथा साँस्कृतिक सम्पदाको प्रभावकारी व्यवस्थापन मार्फत जैविक विविधता संरक्षण, संरक्षण र पर्यटनबिच सन्तुलन कायम राख्नको लागी पर्यटन व्यवसाय प्रवर्द्धन तथा नियमन गर्दै स्थानिय समुदायको जिविकोपार्जन सुधार गर्नमा टेवा पुगाउनु रहेको छ । मकालु वरुण राष्ट्रिय निकुञ्ज तथा यसको मध्यवर्ती क्षेत्रको व्यवस्थापन योजनाका निम्नानुसार चारवटा खास उद्देश्यहरु रहेका छन् ।

- पारिस्थितिकीय कार्य तथा पद्दति कायम राख्नको लागी निकुञ्जमा पाईने संर्रक्षित एवं संकटापन्न वन्यजन्तु प्रजातिहरु त्था तिनीहरुको बास्थानलाई बिशेष ध्यान दिई जैविक विविधता संरक्षण गर्नु ।
- पारिस्थितिकीय अक्षुणता कायम गर्दै सांस्कृतिक सम्पदाको संरक्षण समेत हुनेगरी पर्यटन व्यवसाय प्रवर्द्धन तथा आवश्यकता अनुसार पर्यटन व्यवसायसंग सम्बन्धित क्रियाकलापहरु नियमन गर्नु ।
- जैविक विविधता संरक्षणमा स्थानिय समुदायलाई अभिप्रेरित गर्नको लागी मध्यवर्ती क्षेत्रका बासिन्दाहरुको संरक्षण सम्बन्धि सचेतना अभिवृद्धि तथा जिविकोपार्जन सुधार गर्नु ।
- अध्ययन अनुसन्धान, क्षमता अभिवृद्धि, समन्वय तथा सहकार्यको माध्यमबाट मकालु वरुण राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको संस्थागत क्षमता अभिवृद्धि गर्नु ।

व्यवस्थापन योजनामा समावेश गरिएका मुख्य विषयवस्तुहरुमा जैविक विविधता संरक्षण, बासस्थान व्यवस्थापन, पर्यटन तथा प्रकृतिको व्यवस्थापन, मध्यवर्ती क्षेत्रको व्यवस्थापन, अध्ययन अनुसन्धान, अनुगमन र क्षमता अभिवृद्धि रहेका छन् । त्यसैगरी हिउँ चितुवा, कस्तुरी मृग, हिमाली कालो भालु, हाब्रे र सालकलाई दृष्टिगत गरी प्रजाति संरक्षण विशेष कार्यक्रम तयार गरिएको छ । यस व्यवस्थापन योजनाले जलवायु परिवर्तनको प्रभावको सन्दर्भमा निकुञ्जको बिशेष प्राकृतिक सौन्दर्य तथा महत्वमा पर्नसक्ने असर तथा मध्यवर्ती क्षेत्रका स्थानिय बासिन्दाहरुलाई पर्नसक्ने असर न्यूनिकरण गर्दै निकुञ्ज तथा मध्यवर्ती क्षेत्रको व्यवस्थापन गर्नको लागी समेत प्रयास गरेको छ । यस व्यवस्थापन योजनामा समाविष्ट मुख्य मुख्य कार्यक्रमहरुमा निकुञ्जको संरक्षण, बासस्थान व्यवस्थापन, आधारभुत भौतिक पूर्वाधार निर्माण, पर्यटन प्रवर्द्धन, सामुदायिक विकास, जनचेतना अभिवृद्धि, अध्ययन अनुसन्धान, अनुगमन र क्षमता अभिवृद्धि रहेका छन् ।

यस व्यवस्थापन योजनाले पाँच वर्ष अवधिको लागी प्रस्ताव गरेका क्रियाकलापहरु कार्यान्वयन गर्नका लागी तलब भत्ता लगायतका प्रशासनिक खर्च बाहेक ६२,३४,४४,८८२.०० (बासठ्ठी करोड चौतिस लाख चौवालिस हजार आठ सय वयासी रुपैया मात्र) आवश्यक पर्ने अनुमान गरिएको छ । यस योजनामा प्रस्ताव गरिएका विभिन्न कार्यक्रमहरु मध्ये निकुञ्जको सुरक्षा र वासस्थान व्यवस्थापनलाई प्राथमिकता दिईएको छ । वासस्थान व्यवस्थापन विशेष गरी घाँसे मैदान र सिमसार क्षेत्र व्यवस्थापन पर्दछन् । प्रस्तावित उक्त कुल वजेटको ५४% रकम निकुञ्जको सुरक्षामा छुट्टाईएको छ भने पर्या-पर्यटन प्रवर्द्धनका लागी २४% रकम प्रस्ताव गरिएको छ । त्यस्तै अध्ययन, अनुसन्धान तथा क्षमता विकासका लागी ८% रकम प्रस्ताव गरिएको छ । नेपाल सरकारबाट यस संरक्षण क्षेत्रका लागी विनियोजन हुने गरेको वजेट

योजनाले प्रस्ताव गरेको कूल वजेटको २४% मात्र हुन आउँछ । तसर्थ, बाकी ७६ % रकम स्थानिय सरकार र संरक्षण साझेदार वा अन्य निकायबाट पूर्ति गर्नुपर्ने देखिन्छ ।

साथै, यस योजनामा मध्यवर्ती क्षेत्रतर्फ मध्यवर्ती व्यवस्थापन समिति र १२ वटा मध्यवर्ती उपभोक्ता समितिहरुको कूल कार्यक्रम वजेट रु १६,१३,५६,०००.०० (अक्षरेपी सोह्र करोड तेह्र लाख छपन्न हजार रुपैया) रहेको छ । मध्यवर्ती उपभोक्ता समितिहरुको कार्यक्रमले संरक्षण, सामुदायिक विकास, सिप विकास तथा आय आर्जन र संरक्षण शिक्षा सहयोग पुगाउने छ ।

यस व्यवस्थापन योजनाले प्रस्ताव गरेका क्रियाकलापहरु कार्यान्वयन भएमा मकालु वरुण राष्ट्रिय निकुञ्ज तथा यसको मध्यवर्ती क्षेत्रको जैविक विविधता संरक्षण हुने, स्थानिय बासिन्दाहरुको जिवनस्तर सुधार हुने गरी पर्यटन प्रवर्द्धन हुने साथै मकालु वरुण राष्ट्रिय निकुञ्ज कार्यालयका कर्मचारीहरु तथा मध्यवर्ती क्षेत्रका समूह समितिहरुको संस्थागत क्षमता अभिवृद्धि हुने समेत अपेक्ष गरिएको छ । अर्को तर्फ व्यवस्थापन योजना कार्यान्वयनबाट ३,५७,१७९ श्रमदिन रोजगारी सिर्जना हुने अनुमान गरिएको छ जसबाट स्थानिय समुदायको जिविकोपार्जन सुधारमा योगदान पुग्ने अपेक्षा गरिएको छ ।

ACRONYMS

ACO	Assistant Conservation Officer
AHT	Assistant Health Technician
AIS	Allien and Invasive Species
AoR	Area of Responsibility
APPA	Appreciative Participatory Planning and Action
APU	Anti-poaching Unit
BS	Bikram sambat (Nepali calender)
BZ	Buffer Zone
BZCF	Buffer Zone Community Forest
BZMC	Buffer Zone Management Committee
BZUC	Buffer Zone User Committee
BZUG	Buffer Zone User Group
CAMP	Conservation Assessment of Medicinal Plants
CBAPU	Community Based Anti-poaching Unit
CC	Climate Change
CCO	Chief Conservation Officer
CITES	Convention On International Trade on Endangered Species of Fauna and Flora
DAO	District Administration Office
DG	Director General
DHM	Department of Hydrology and Meteorology
DLSO	District Livestock Support Office
DNPWC	Department of National Parks and Wildlife Conservation
FY	Fiscal year
GIS	Geographical Information System
GLOFs	Glacial Lake Outburst Floods

GoN	Government of Nepal
GSLEP	Global Snow Leopard & Ecosystem Protection Program
HQ	Headquarter
HRD	Human Resources Development
IUCN	The World Conservation Union (International Union for Conservation of Nature and Natural resources)
JTA	Junior Technical Assistant
KM^2	Square Kilometer
KSL	Kailash Sacred Landscape
KSLCDI	Kailash Sacred Landscape Conservation & Development Initiative
LIS	Livestock Insurance Scheme
M	Meter
MAPs	Medicinal and Aromatic Plants
MBC	Makalu Base Camp
MBCAP	Makalu Barun Conservation Area Project
MBNP	Makalu Barun National Park
Mm	Milimeter
MoFE	Ministry of Forests and Environment
MPAs	Mountain Protected Areas
NA	Nepal Army
NAST	Nepal Academy Science and Technology
NBSAP	Nepal Biodiversity Strategy and Action Plan
NGO	Non Governmental Organization
NMA	Nepal Mountaineering Association
NPWC	National Park and Wildlife Conservation
NRs.	Nepali Rupees
NSLEP	National Snow Leopard & Ecosystem Protection Priorities
NTB	Nepal Tourism Board

NTCC	National Tiger Conservation Committee
NTFP	Non- Timber Forest Product
NWCCCC	National Wildlife Crime Control Co-ordination Committee
PA	Protected Area
PES	Payment of Environmental Services
QNNP	Quomolongma National Natural Preserve
RCC	Reinforced Cement Concrete
RM	Rural Municipality
SAWEN	South Asia Wildlife Enforcement Network
SLCAP	Snow Leopard Conservation Action Plan
SLCC	Snow Leopard Conservation Committee
SLIMS	Snow leopard Information Management system
SMART	Special Monitoring and Reporting Tool
SNP	Sagarmatha National Park
TAAN	Travel Agents Association of Nepal
TAR	Tibet Autonomous Region
ToT	Training of Trainers
UC	User Committee
UG	User Group
VDC	Village Development Committee
VIC	Visitor Information Centre
WCCB	Wildlife Crime Control Bureau
WMI	Woodlands Mountain Institute
WWF	World Wildlife Fund

TABLE OF CONTENTS

Annexes:

LIST OF TABLES

LIST OF FIGURE

MAKALU BARUN NATIONAL PARK AND ITS BUFFER ZONE AT A GLANCE

Location: Northern mountain of eastern Nepal
National Park Designation Year : 18 November 1991 (08 Mangsir, 2048)
IUCN Category : II
National Park Area : 1,500 km2
PA headquarters : Seduwa, Sankhuwasabha
Sectors : Hattiya Sector, Seduwa Sector, Tamku Sector, Bung Sector and Mera Peak Sector
Posts: Kimathanka Rangepost, Gola Post, Hedangna Gadhi Post, Pukhuwa Dovan Post, Sankhuwa Dovan Post, Yangsima Post, Kothe Post and Cheskam Rangepost
Entrance Gates : Bung Sector, Seduwa Sector, Kothe Post, Hedangna Gadhi Post, Hattiya Sector, Sankhuwa Dobhan Post
Buffer Zone Gazetted Year: February 8, 1999 (25 Magh, 2055)
IUCN Category: VI
Buffer Zone Area: 830 km2
Buffer Zone District: 2
Buffer Zone Rural Municipality: 4
Buffer Zone User Committees: 12
Buffer Zone User Groups: 95
Buffer Zone Households: 7680
Buffer Zone Population: 36395 (CBS 2011)
Major Ethnic Group: Rai, Bhote, Sherpa, Tamang, Gurung
Major Religion: Hindu and Buddhism
Major Glaciers: Barun, Mera, Chamlang, Hunku
Major Rivers : Arun, Barun, Inkhu Khola, Hongu Khola, Sisuwa Khola, Sankhuwa Khola, Apsuwa Khola, Isuwa Khola, Kasuwa Khola
Major Peaks : Makalu (8,463 m asl), Baruntse (7,129 m), Chamlang (7,319 m), Himchuli (6,424 m), Naulekh (6,358 m) and Mera Peak (6,654 m)
Bioclimatic Zone: Upper Tropical to Nival
Climate: Eastern Himalayan Climatic Regime
Elevation Range: 435 m to 8,463 m above MSL
Main Mammals : Snow Leopard, Musk Deer, Himalayan Black Bear, Red Panda, Chinese Pangolin, Assamese macaque, Wild dog
Major Trees: Hill Sal, Chilaune, Katus, Chir Pine, Blue Pine, Rhododendron, Deodar, Oak, Maple, Hemlock, Fir, Juniper and Birch
Major attractions: Arun Valley, Barun Valley, Saldim Valley, Mera Area (6,476 masl), Climbing in Mera Peak, Mt. Makalu (5th highest mountain in the world 8,463 masl)
Major Cultural sites: Shiva Dhara, Barun Dovan, Saisima, Khyampalung, Thulo Pokhari.
Annual Visitors: 1252 in the FY 2074/75
Annual Revenue: Rs. 5177208 (US $45382) in the FY 2074/75

Management Plan Preparation Process

Management Plan of Makalu Barun National Park and Buffer Zone Fiscal Year 2076/77-2080/81is a culminated result of team effort from associated stakeholders. This management plan has followed a participatory approach embracing all relevant stakeholders during the process. To allow communities and groups to identify and emphasizes their biological resources as a means to prosper them and to strengthen the persistence of sustainable participation, appreciative participatory planning and action (APPA) has been justified during its preparation process. The guidelines endorsed by DNPWC in the predesigned format had been followed carefully. First, a Management Plan Preparation Team was formed, which was led by Chief Conservation Officer (CCO). The team reviewed numerous published and unpublished literature, conducted consultations, meetings, workshops, field works and observations and collected primary data indispensable for the management plan.

The management plan is based on two broad parts viz; (i) National Park and (ii) Buffer Zone. The preparation of management plan of *National Park* involved assembling of suggestions comments and feedback from relevant stakeholders and their associated organizations. For the latter, buffer zone user committees (BZUCs) prepared their 5 year plan and activities on consultant have and park staff's facilitation. Consultation meetings and interaction program were conducted on all 12 BZUCs. A draft plan was then made which was discussedin the consultation meeting organized among Buffer Zone Management Committee (BZMC) followed by district level stakeholders consultation meeting at Khandbari, Sankhuwasabha.

Similarly, central level sharing workshop was held at DNPWC inviting officials from significant government agencies, conservation partners, professionals, conservation scholars and other stakeholders. The workshop identified key gaps in plan and provided important suggestions to fill up these gaps. The comments and suggestions from these meetings and workshops were incorporated in the draft management plan. The draft plan was then sent for expert review. Comments, suggestions and constructive criticisms from experts were incorporated into the final plan. Finally, the plan document was forwarded for technical and language editing to experts before it was tabled for approval in DNPWC.

PART A - THE EXISTING SITUATION

CHAPTER 1- INTRODUCTION OF THE PROTECTED AREA

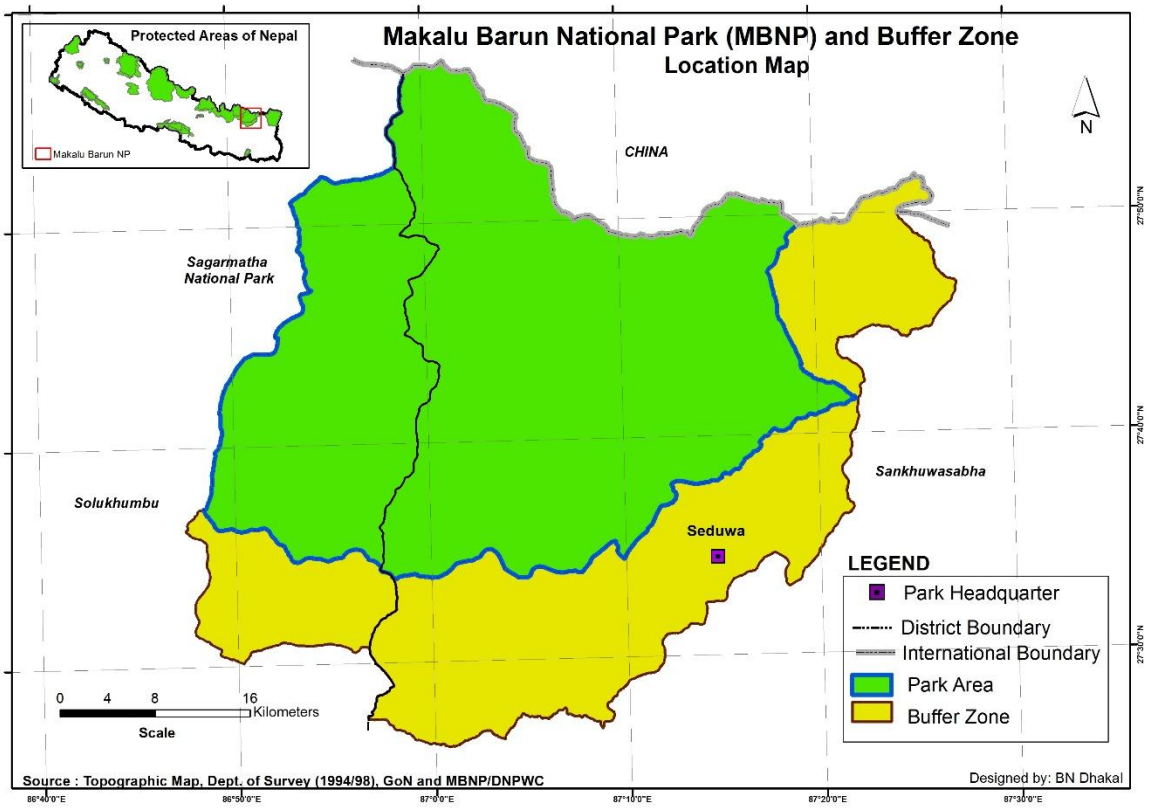
1.1 Name, Location, Constitution and Extent

Name:

Makalu Barun National Park (MBNP) and its Buffer Zone.

Location

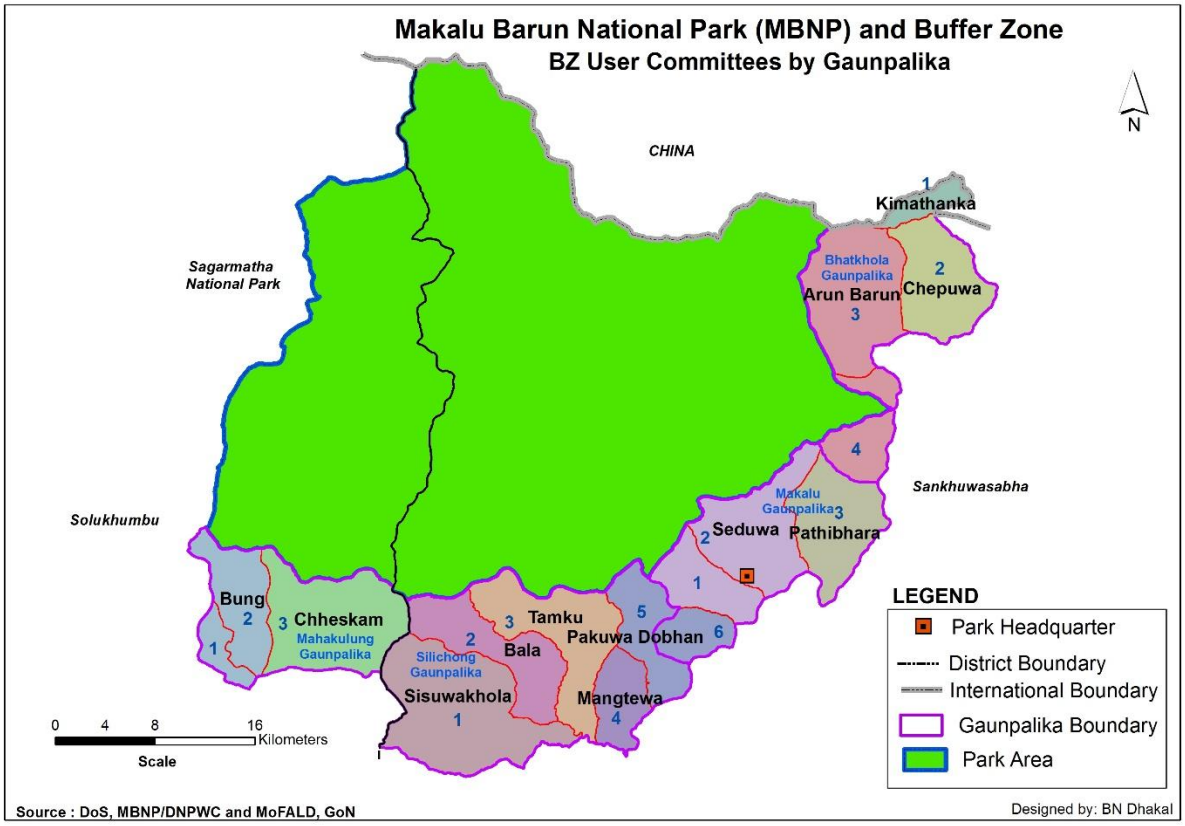
Makalu Barun National Park and Buffer Zone is bounded in the north by the Nepal/China border (the Qomolangma National Park of Tibetan Autonomous Region), the east and south by the Arun river and the west by Sagarmatha National Park. It covers parts of Sankhuwasbha and Solukhumbu districts.The geographical location of the park is between 27^0 25' 48" N to 27^0 33' 00" N latitude to 85^0 46' 12" E to 87^0 21' 36" E longitude (Map 1).



Map1: MBNP and BZ in Sankhuwasabha and Solukhumbu districts

Constitution and Extent

Makalu Barun National Park (MBNP) was declared as the 8th National Park and the 12th protected area of Nepal in 18th November 1991 covering area of 1500 km^2. The area of 830 km^2 was gazetted in 8th February 1999 as Buffer Zone which was previously managed as conservation area. Of the total Park Core area, 72.53% falls in Sankhuwasbha districtand remaining 24.47% falls in Solukhumbu district. Similarly, in case of Buffer Zone area, Sankhuwasbha and Solukhumbu districts occupy 83.52% and 16.48% respectively. MBNP and BZ covers parts of Bhot Khola rural municipality, Makalu rural municipality, fully encompasses Siluchung rural municipality in Sankhuwasbha district and parts of Maha Kulung rural municipality in Solukhumbu district (Map 2).



Map 2: Administrative map of MBNP showing Rural Municipality

1.2 Access

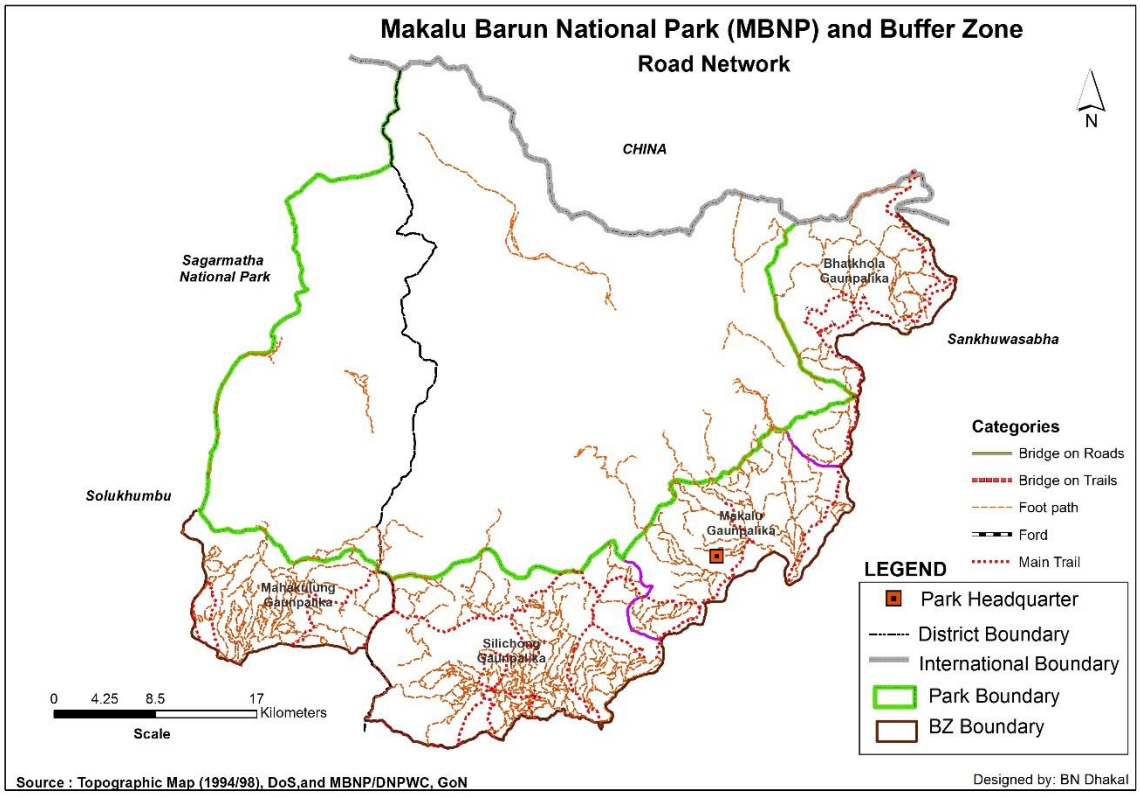
The Park headquarter is located at Makalu rural municipality-3, Seduwa, Sankhuwasabha. The flight from Kathmandu to Tumlingtar takes about 35 minutes and a 5 hour drive to reach Num. Similarly, flights are also available from Biratnagarto Tumlingtar three days a week.

Num is also connected to Biratnagar and Dharan through road network. From both cities Num can be reached by bus and jeeps in about 12 hour. It takes a day walk across the Arun Valley from Num to reach Park headquarter.

One can also reach Inkhu valley of Makalu Barun National Park from Lukla and Phaplu airports. There is regular flight from Kathmandu to Lukla and Phaplu airport.

The highly anticipated and prirotized North-South Koshi Highway project, linking Eastern Nepal with India and China, is currently under construction which also aligned along the borderof buffer zone area of the Park.

The road and trail network is shown in the figure below (Map3).



Map3: Road network in MBNP and BZ

1.3 Statement of Significance

Makalu-Barun National Park and buffer zone extends from tropical forests along the Arun River to icy mountain summits, making it the only protected area on earth with an elevation gain of 8000m. The Park treasures some of the last remaining pristine forests and alpine meadows in the

world. It is the only protected area in the country to encompass wide altitudinal range of 435 m – 8,463 m, within a short horizontal distance of 40 km from south to north, harboring a wide range of ecosystem services. Other significant characteristics and features of the Park are as follows:

- Among12 terrestrial eco-regions in Nepal,this park comprises of 4 terrestrial eco-regions, namely (i) The Eastern Himalayan Broadleaf Forests, (ii) Eastern Himalayan Conifer Forests, (iii) Eastern Himalayan Alpine Shrub and Meadows and (iv) Himalayan Subtropical Broadleaf Forests.
- The landscape consists of mountain peaks, glaciers, high altitude lakes, pastures, forests and rivers.
- The skyline is a panorama of rugged Himalayan peaks including Mt. Makalu (8463m), the fifth highest mountain in the world and fourth highest in Nepal; Mt. Chamlang (7319m), Mt. Baruntse (7129m), and Mera Peak (6654m); Mt Makalu is the Park's major landmark; Makalu base campand Mera peak are popular trekking routes.
- Situated in one of the highest regions of the world, the Park area is of significant scientific value and offers unique research opportunities to scientists.
- Out of many valleys inside the park, Barun Valley is considered to be of global significance, and provides a living laboratory for international scientific research. Plants like *Swertia barunensis* (4200m) and Potentilla Makaluensis (4000m) nomenclatured under the name of river Barun and Mt. Makalu are endemic to this Valley.
- The Park area is habitat for 88 species of mammalsmost among the existing National Parks. and 433 species ofbirds, 78 species of fishes, 16 species of amphibians, 43 species of reptiles and 315 species of butterflies. It is also identified as one of the Important Bird and Biodiversity Areas of Nepal (IBAs).
- The area provides habitats rare and endangered species such as Snow leopard (*Uncia uncia*), Clouded leopard (*Neofelis nebulosa*), Leopard cat (*Felis bengalensis*), Red panda (*Ailurus fulgens*), Musk deer (*Moschus chrysogaster*), Himalayan Black bear (*Selenarctos thibetanus*),Himalayan palm civet (*Paguma larvata*), Hanuman langur (*Presbytis entellus*), Chinese pangolin (*Manis pentadactyla*), Assamese monkey (*Macaca assamensis*), Yellow throated marten (*Martes flavigula*) and Goral (*Nemorhaedus goral*), most of which are also on the CITES list and also protected by government. Other species include common leopard (Panthera pardus), jackal (Canis aureus), Himalayan Thar (Hemitragus jemlahicus), barking deer (Muntiacus muntjak).
- Similarly, Spiny babbler, hill patridge and pheasants such as Himalayan monal and Kalij are the main attraction of the Park area.
- The Park area comprises bioclimatic zones from Upper Tropical to Nival consisting 27 forest types out of 35 forest types found in Nepal.
- Out of 31 species of Rhododendron found in Nepal the Park area harbours 25 species of Rhododendron. More than 3000 species of flowering plants are found in the Park, of

which 18 are endemic to the Park. Similarly, Park harbours more than 100 species of Orchids.

- The glaciers and lakes inside the Park area are of high hrdrological value for wildlife and downstream communities. Several rivers originating and flowing throughthe Park area support diverse aquatic ecosystems home for endemic and rare amphibians and Pisces.
- The Park encompasses places of several religious and cultural signifancewith sacredmountains and holy places, such as, Shiva Dhara, Barun Dovan, Saisima, Khyampalung, Thulo Pokhari, Panch Pokhari, Kenpa, Goubitta etc.
- This Park is important part of Sacred Himalayan Landscape connecting Kanchenjunga Conservation Area and Tinjure Milke Jaljala (TMJ) Protected Forest, Qomolangma National Park of Tibetan Autonomous Region of China in the North, Sagarmatha National Park in the West.
- According to a belief from the Nyingma school of Tibetan Buddhism, there are places which Padmasambhava blessed as refuges called Beyul meaning hidden valleys; Barun Valley is one of them.Historical religious texts advocate that pilgrims may have been visiting sacred sites in the Barun Valley since the 14th century (Byers, A.C, 1996). Other religious sites are Arun-Barun Dobhan, Shiva Dhara, Kenpa/Gaubitta.

CHAPTER 2 – BACKGROUND INFORMATION AND ATTRIBUTES

2.1 Boundaries

2.1.1 Legal

Makalu Barun National Park (MBNP) was gazetted as National Park in 18th November 1991 covering an area of 1500 km^2. The area of 830 $km^2$was gazetted in 8th February 1999 as Buffer Zone which was previously managed as conservation area.The boundary of the Park and BZ as is duly notified and demarcated on the ground as per the gazette notification of the Government of Nepal (GoN) which is presented in Annex 11.

2.1.2 Legislation

2.1.2.1 National parks and Wildlife Conservation (NPWC) Act 2029 (1973 AD)

The Clause (3) (1)(Ka) of the fifth amendment of National Parks and Wildlife Conservation (NPWC) Act, 2029 has made it mandatory that National Parks, Wildlife Reserves and Conservation Areasmust be conserved and managed by the management planapproved by the Department of National Parks and Wildlife Conservation (DNPWC).Similarly Clause 3 b of NPWC Act 2029 has provision that the Warden shall carry out works relating to the management and conservation of the buffer Zone. Provided that ownership of the land of the local people shall not be affected while managing and conserving the area.

2.1.2.2 International Trade in Endangered Species of Wild Flora and Fauna Control Act, 2073 (2017 AD)

International Trade in Endangered Wildlife Flora and FaunaControl Act, 2073, generally known as CITES Act, has recently been enacted. This Act has authorized Chief Conservation Officer (CCO) or Officer assigned by him/her of the protected area to work as Investigation Officer in illegal wildlife trade related offences and to file case in District Court as per the Clause (23).

2.1.2.3 Buffer Zone Management Rules, 2052 (1996 AD)

The Rule (5) (1) of the Buffer Zone Management Rules, 2052 (1996 AD) has made provision for preparation of management plan of Buffer Zone. The management plan will be prepared by Chief Conservation Officer (CCO) with the support of Assistant Conservation Officers (ACOs) and experts, if required, and submit it to the Director General (DG) of DNPWC for the approval.

Similarly, Rule (5) (2) of the Regulation has outlined the points to be included in the management plan.

This rules also has provisions of formation of Buffer Zone User Groups (BZUGs), Buffer Zone User Committees (BZUCs) and Buffer Zone Management Committee (BZMC) by CCO for participatory biodiversity conservation in the Buffer Zone (BZ) area with the support of Park authority. This rules also requires preparation of operational plans of Buffer Zone User Groups (BZUGs) and Buffer Zone User Committees (BZUCs) for sustainable conservation and management of biodiversity in BZ areas.

2.1.3 Transboundary Linkage and Ecological Significance

MBNP is connected with SNP (1,148 km^2) in the west and QNP (38,480 km^2) of TAR China to the north. The establishment of these administratively separate but physically contiguous PAs provide opportunities for ecosystem level conservation. The Park is one of the protected areas included in Sacred Himalayan Landscape, which extends from Langtang National Park in central Nepal through the Kangchenjunga region in Sikkim and Darjeeling in India to Toorsa Strict Nature Reserve in western Bhutan covering an area of 30,021 km2.

The Park has vital role in achieving the aim of Sacred Himalayan Landscape (SHL) to conserve the rich biodiversity and enhance local livelihood needs and sustain diverse culture and traditions in the globally important Eastern Himalayan Region.The large and contiguous protected landscape secures the habitat of many wide-ranging rare and endangered flora and fauna, boost up ecological processes, and promote socio-economic interactions between resident populations.

2.2 Physiography

Out of five representative physiographic regions of Nepal *viz.* Tarai, Churia, Middle Mounatins, High Mountains and High Himal, MBNP represents the later three (Table 2). Though the major parts of MBNP falls within the High Mountain and High Himal physiographic regions of Nepal.

Table 1 Physiographic aspects of MBNP and Its BZ

Bioclimatic zone	Altitude (metre)	Physiographic zone
Nival	Above 5000	High Himal
Upper Alpine	4501-5000	High Mountains
Lower Alpine	4001-4500	
Upper Sub-Alpine	3501-4000	
Lower Sub-Alpine	3001-3500	
Upper Temperate	2501-3000	Mid-Hills

Lower Temperate	2001-2500	
Upper Sub-Tropical	1501-2000	
Lower Sub-Tropical	1001-1500	
Upper Tropical	501-1000	
Source: Bhuju *et al.* 2007		

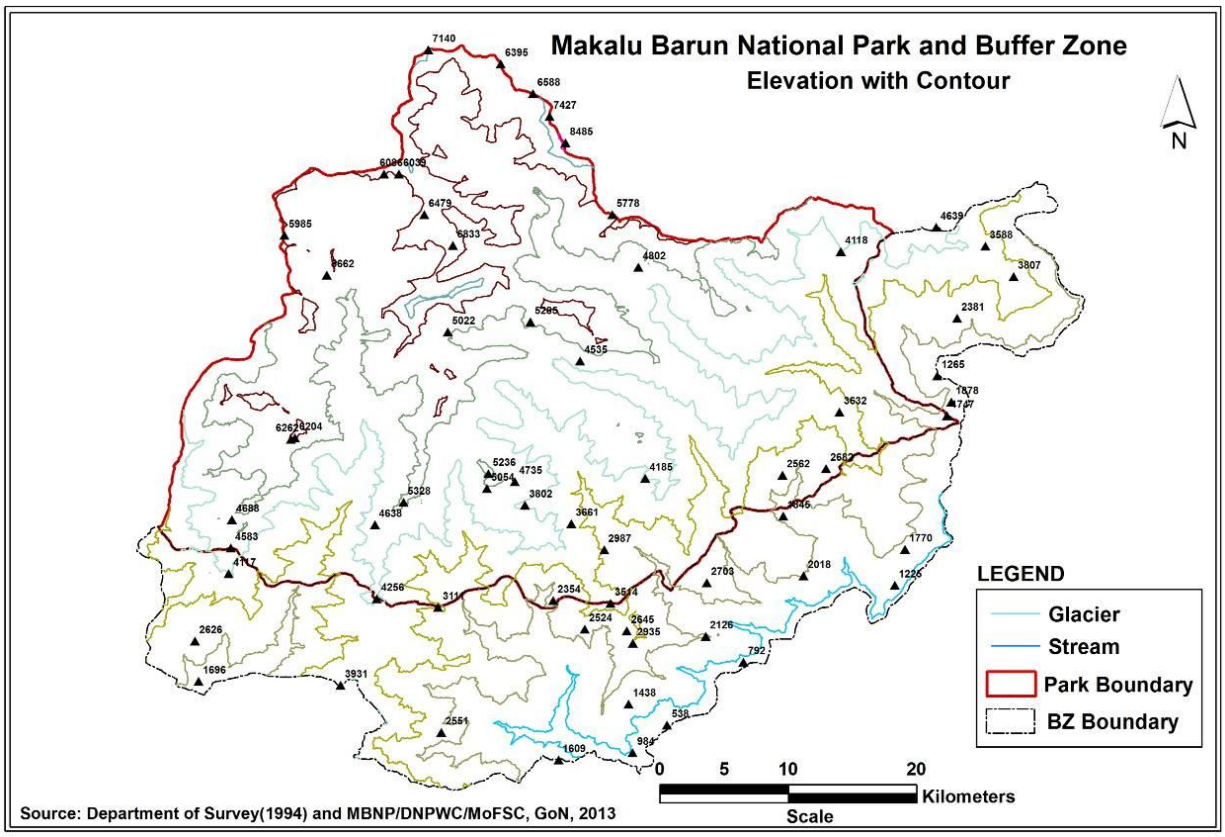
2.3 Geology and Soil

Geologically, it is composed of two major lithotectonic units; the northern Khumbu nappe (i.e. a large-scale overfold in the earth's crustal rocks) and southern Kathmandu nappe. The Khumbu nappe is tectonically superimposed over the Kathmandu nappe, and both of them are again transposed over the Nuwakot nappe (the tectonic unit south of the MBNP). The southward movement of these rock masses occurred during the early Miocene Period (26 million years ago), although studies suggest that the Himalayan range is still active and rising.

The axis of the Arun anticline, a pre-Himalayan geologic structure reactivated during the Himalayan orogenic movement, runs roughly north-south through the Arun Valley. The down cutting of the antecedent Arun River has usually kept pace with the rise of the Himalaya, eroding a rock sequence at least 8,000 m thick.

All the rivers of the area flow clear and free of sediments in spring and fall seasons. However, heavy soil sediments are washed out during the monsoon. The most widespread soil types in the park area are Cryorthents on the steep slopes, Cryumbrepts on moderate slopes, at the higher elevation regions and Ustorthents on steep slopes. Eutrochrepts, Dystrochrepts and Laplumbrepts may be common on gentle slopes at the lower elevations (DNPWC and WMI 1990).

The area has very old rocks of Precambrian Himalayan gneisses, occupying most of the upper elevation areas with the exception of peak of Mt. Makalu. Precambrian to Devonian rock types underlines most of the lower valley slopes along the Arun River. The rock type includes schists, quartzite and gneisses that are resistant to weathering and erosion. Different glaciers such as Makalu, Barun, Mera, Chamlang, Hunku enrich the snow in the area (Map 4).



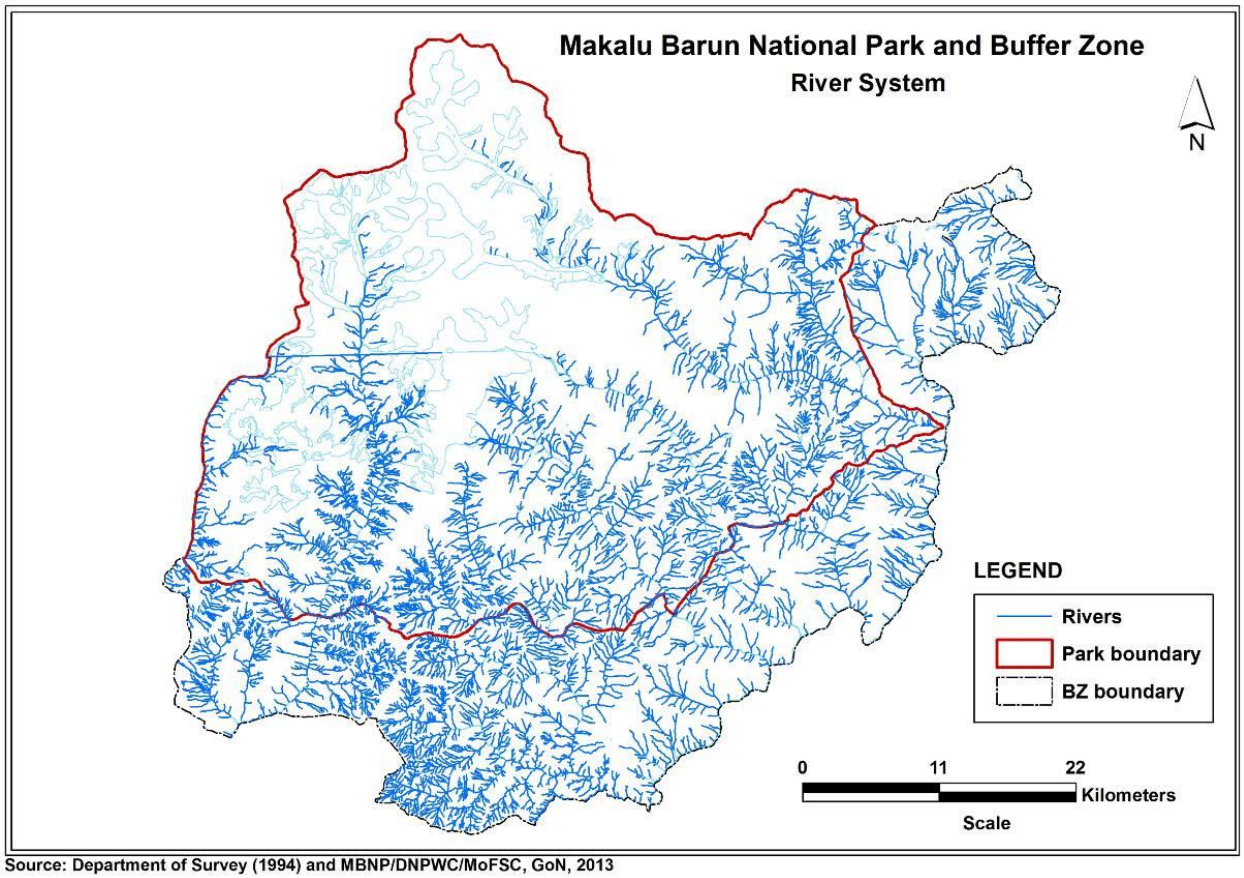
Map 4: Elevation range showing snow covered areas in MBNP

2.4 Topography and Drainage

The land mass of the Park area rises steeply form the Arun river and becomes gentler in the upper elevations until it meets the glaciers. Located at the head of the glaciers are the high Himalayan Peaks of Makalu (8,463 m asl), Baruntse (7,129 m asl), Chamlang (7,319 m asl), Himchuli (6, 424 m), Naulekh (6,358 m asl) and Mera Peak (6,476 m asl) (DNPWC and WMI 1990, Map 4). The upper reaches of the major river valleys are wide, U-shaped and gently sloping, indicating recent glacial activities.

Seven major watershed tributaries forming river valleys to the south are Barun, Kasuwa, Isuwa, Apsuwa and Sankhuwa rivers draining into the Arun river, and Hongu and Inkhu draining into Dudh Koshi river.

The Park area is also famous for many stagnant water bodies (lakes/ponds) such as Panch



Source: Department of Survey (1994) and MBNP/DNPWC/MoFSC, GoN, 2013

Map 5 : River sytems in MBNP

Pokhari, Barun Pokhari, Tama Pokhari, Dudh Pokhari, Jhule Pokhari, Yekle Pokhari, Tin Pokhari, Thulo Pokhari, etc. (Jha 2003).

2.5 Climate

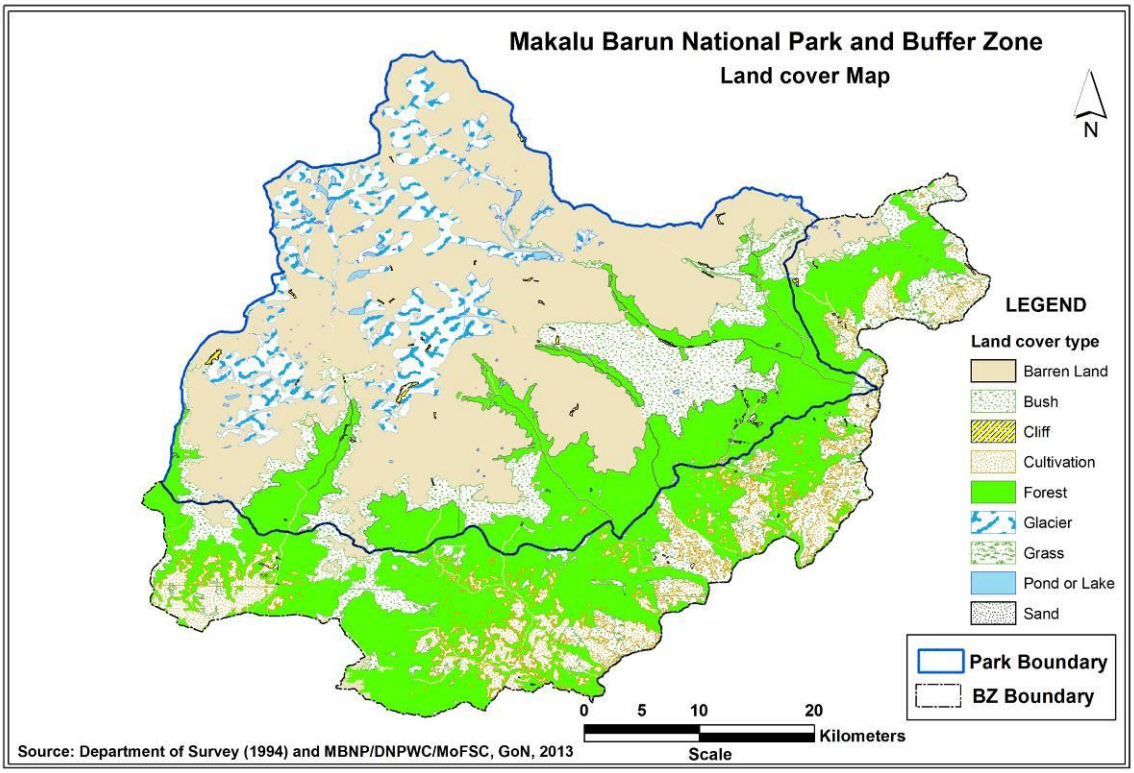
Makalu-Barun area falls in the Eastern Himalayan Climatic Regime where monsoon starts early (June) and stays longer than in west Nepal (until late September). The climate is generally described as monsoon type, where more than 70% of the precipitation occurs between June and September. Pre monsoon rain is common during the month of April and May, an important factor in biomes production. Great variations in temperature and precipitation can be expected due to extreme differences in altitude, slope and aspect within the area. Precipitation seems to be heaviest on south and south-east facing slopes between the elevations of 2,000 and 3,000 meters. The average annual precipitation recorded at Num (4000 mm) is ranked as one of the highest in Nepal. The precipitaion pattern decreases as one moves up in higher elevations.

2.6 Land use pattern

The total area of the park, including BZ is 2,330 km^2 which comprises 831.18 km^2 (35.67%) barren land, 764.22 km^2 (32.84%) forest, 342.84 km^2 (14.71%) bush/shrub land, 158.76 km^2 (6.81%) cultivated land, 195.31 km^2 (8.38%) glacier, and 37.68 km^2 (1.61 %) other landuse types (grass land, pond or lakes, river cutting/cliffs, sandy area and water bodies) (DNPWC 2012, Table 2, Map 5 and 6).

Table 2 Land use pattern of MBNPBZ

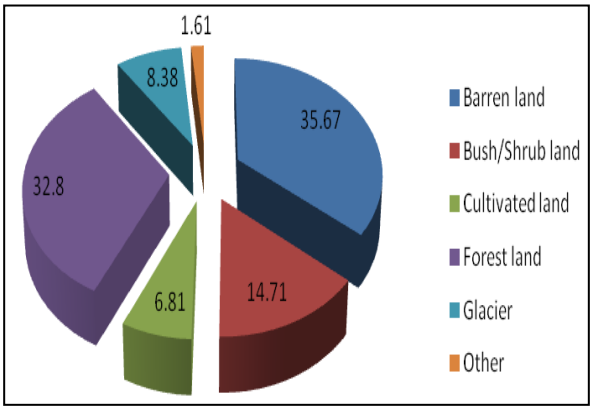
Land cover class	Area (km^2)	Percentage
Barren land	831.18	35.67
Bush/Shrub land	342.84	14.71
Cultivated land	158.76	6.81
Forest land	764.22	32.80
Glacier	195.31	8.38
Grass land	13.55	0.58
Pond or lakes	8.42	0.36
River cutting/cliffs	1.45	0.06
Sandy area	10.32	0.44
Water bodies	3.94	0.17
Total	**2330**	**100.00**



Map6: Land cover map of MBNP and BZ

During 1995-2013 a significant change in major land use types is observed in MBNP (Table 3). There was an overall increase in shrub land and cultivated land by 150.84 km^2 (78.6%) and 64.76 km^2 (68.9%) respectively, whereas forest land and grass land were decreased by 118.78 km^2 (13.5%) and 281.45 km^2 (95.5%) respectively.

The overall increase in shrub land could be the natural growth of grassland in to shrubland in the upper reaches in one hand and conversion of forest in the shrubland due to slash and burn practices for shifting cultivation (Chaudhary and Vetaas 2002).



Map 7: Land use types in MBNP-BZ

Table 3: Land use cover change in MBNP during 1995-2013

Land cover class	Area (km^2)		Change in land cover type Area (sq.km)
	1995 AD	2013 AD	
Bush/shrub	192	342.84	150.84
Cultivated land	94	158.76	64.76

Forest land	883	764.21	-118.79
Grassland	295	13.55	-281.45

(***Source:*** **Chaudhary and Vetaas 2002, DNPWC 2013**)

2.7 Socio-economy Attributes

Demographic features

Nearly 36,395 people (Male: 17,266, Female: 17,201) of different ethnicity inhabit BZ of MBNP (CBS 2011) comprising of 7,680 households (Table 4).

Table 4. Population in the BZ of MBNP

VDC	Number of HH	Male Population	Female Population	Total
Bala	567	1331	1497	2828
Bung	982	2247	2273	4520
Chepuwa	404	849	890	1739
Chheskam	809	1810	1975	3767
Hatiya	1175	2710	3174	5884
Kimathanka	72	183	185	368
Makalu	849	1954	1908	3862
Mangtewa	411	1008	1002	2010
Pathibhara	718	1609	1644	3253
Sisuwa	604	1424	1471	2895
Tamku	570	`429	1428	2878
Yafu	519	1429	1428	2391
Sum total	**7680**	**17266**	**17201**	**36395**

(Source: CBS 2011)

Agriculture and animal husbandary

Household dependency on land resources is critical in the area. Nearly 98% households own some type of land for cultivating crops and growing various kinds of trees. The main occupation of the area is subsistence agriculture, animal husbandry, seasonal migration (trade and labor), eco-tourism, etc. Most of the households (83%) owns some kind of livestock and poultry.

According to land use pattern scenario only 16.16 % of the total area is under agricultural practice. Out of that "*Khet*" (irrigated level terrace) is very important for the production of cereals mainly paddy, wheat and lentils, which are limited along the Arun river bank and its tributaries. "*Bari*" (non irrigated sloping terrace) is probably the most common type of agriculture field. Due to sloppy ground, soil erosion is common phenomena. This type of land requires regular farm manure for cultivation of maize, finger millet, potato, buck wheat, vegetable and fruit plant.

Box 1. Slash and burn cultivation– becoming unsustainable practice in MBNP

Slash and burn is a common and traditional farming practice in MBNP. Under the rotational farming system, crops are usually sown in slash and burn fields every five to seven years of interval, which has been reduced to two to three years, thus limiting time for soil fertility reclamation. The practice has immense impacts on vegetation growth and makes land vulnerable to

The present average annual fodder demand is 46.4 *bhari* per household, which is very low quantity out of actual requirement of fodder. According to Baskota *et al.* (1996), more than 74% household reported insufficient fodder availability in the area. However in higher elevations generally the community people have abandoned facility of outdoor grazing and pastures and they do not need much fodder for their livestock. High demand of fodder is in lower belt in BZ. Some substitute of fodder is agricultural biproducts and crops residues, which are not sufficient for livestock farming.

The BZ is rich in natural resources especially forest, grazing land, and water. After the establishment of park and BZ, forest coverage has been increased and management of forests seems encouraging. The communities cultivate cardamom in forest as agro-forestry crops thereby making cash income on one hand and protecting the biodiversity and forest coverage on the other hand.

Education

Due to geographical remoteness, BZ community liracy rate is about 30% and that of women is less than 10% .

Table 5. BZUC wise literacy status and number of schools in BZ of MBNP

Units	Illiterate (%)	Under SLC (%)	Above SLC (%)	No. of Pr.School	No. of Mid School	No. of Sec. School
Bala	71.56	25.7	2.74	7	2	0
Bung	73.91	25.04	1.05	4	1	1
Chepuwa	75.9	19	5.1	4	1	0

Chheskam	66.31	32.8	0.89	3	0	1
Hatiya	78.2	20.6	1.2	7	2	0
Kimathanka	95.7	3.7	0.6	1	0	0
Makalu	70.9	25	4.1	11	1	0
Mangtewa	65.34	29.59	5.07	9	0	1
Pathibhara	71	25	4	9	1	1
Sisuwa	65.1	34	0.9	6	1	0
Tamku	56.03	40.07	3.89	9	0	1
Yafu	64.2	25	10.8	6	1	1
Overall	**71.18**	**25.46**	**3.36**	**6.3**	**0.83**	**0.5**

There are 76 primary, 10 lower secondary and 6 secondary or high schools in BZ area (DNPWC 2007). Two higher secondary schools have been added at present.

Health services

In the BZ medicine and health services are relatively poorly developed, local community traditionally depends on herbal medicines. There were 14 health posts including ayurvedic clinic in the area (DNPWC 2007).

Migration

Migration is common phenomena among the hill people in Nepal. The deteriorating natural resource base, adverse economic conditions, shortage of agricultural land, food deficiencies and lack of employment opportunities are the primary factors that motivate people to migrate but there is no mass migration pattern in MBNPBZ. Some Sherpa and Singshaba bhote families are outmigrated or permanently settled in Khandbari, Kathmandu, and Darjeeling in India and some families are engaged in seasonal work like trekking, expedition, trade and employment abroad.

Religion and culture

According to Nepalese history during 1831 BS., these areas were under the *Kirat* dynasty. The Makalu-Barun area includes a substantial part of a region traditionally designated "majh" (Middle) *Kirat*. The *Kirat* people especially Rai and Limbu are the original inhabitants of these areas. The Rai is the dominant ethnic group in BZ. It has three main sub groups known as Kulung, Mahakulung and the Yamphu. The origin of the Kulung is in Solukhumbu, Yaphu, Tamku and Mangtewa. The Yamphu Rai is concentrated mainly in Pathibhara in Seduwa sectors.

The majority of the Rai people follows the Kirant religion, which is almost distinct from Hinduism and the Buddhism. But some groups of Rai also follow Hinduism. In the Rai culture in all the religious activities and rituals, homemade "Raksi" (liquor) is essential. Their tradition is

preserved by three types of professional hierarchies *viz.* priests, shamans and elders. The traditional Rai economy is heavily dependent on the forest resources. The main occupation is agriculture and cattle rearing. Slash and burn cultivation is a common practice.

2.8 Biological Attributes

2.8.1 Ecosystem diversity

Forest Types

From tropical forests along the Arun River to icy mountain summits, MBNP is the only Protected Area on earth with an elevation gain of 8000 m. The wide range of bioclimatic variation along the elevation gradient of 40-50 km harbors as many as 27 forest types from upper tropical to nival zones, which provide array of forest ecosystem services, flora and fauna. The Park area supports 20 types of forest ecosystems and 12 vegetation types.

Box 2. Vegetation types of MBNPBZ

1. *Upper Alpine Meadow*
2. *Moist Alpine Scrub*
3. *Birch-Rhododendron forest*
4. *Fir forest*
5. *Temperate Mountain Oak forest*
6. *Deciduous Maple – Magnolia - Sorbus forest*
7. *Mixed Rhododendron-Maple forest*
8. *Lower Temperate Oak forest*
9. *East Himalayan Oak-Laurel forest*
10. *Chir Pine and Broadleaved forest*
11. *Schima-Castanopsis forest*

Table 6 : Ecosystem andVegetation types of MBNP and BZ

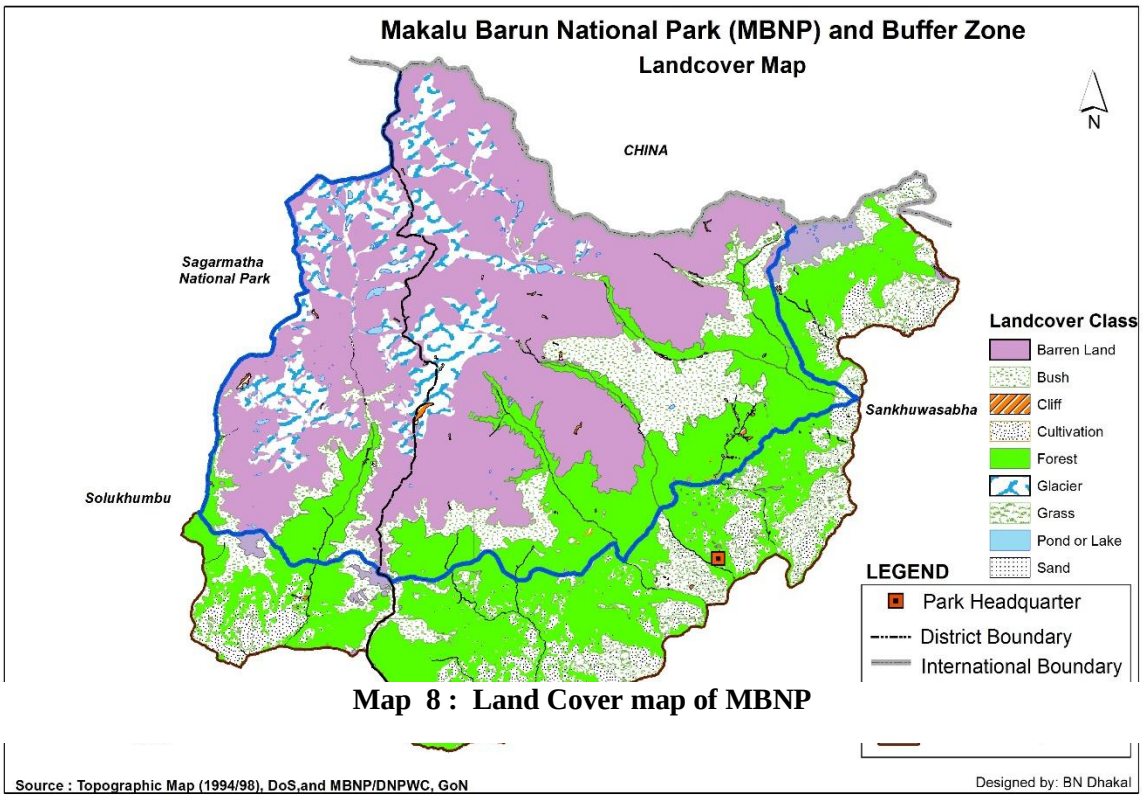
S.N.	Ecosystem type	Vegetation Types
1	Glaciers, snow, rock	Upper Alpine Meadow
2	Alpine meadows with *Graminae* and *Cyperaceae*	Moist Alpine Scrub
3	Rhododendron mesohygrophytic scrublands	Birch-Rhododendron forest
4	Mesohygrophile Rhododendron (*R. anthopogen, R. nivale.*)	Fir forest
5	Shrublands with Rhododendrons	Temperate Mountain Oak forest
6	Upper sub-alpine Rhododendron-Birch forest	Deciduous Maple-Magnolia-Sorbus forest
7	Upper sub-alpine *Betula utilis* with Rhododendron and Fir	Mixed Rhododendron-Maple forest

8	Upper sub-alpine Rhododendron scrublands	Lower Temperate Oak forest
9	Upper-sub-alpine Rhododendron-Juniper scrublands	East Himalayan Oak-Laurel forest
10	Lower sub-alpine Fir (*Abies spectabilis*) Forest	Chir Pine and Broadleafed forest
11	Lower sub-alpine Abies spectabilis Forest	*Schima-Castanopsis* forest
12	Mountain Oak (*Q.semecarpifolia*)	Hill Sal forest
13	Deciduous mixed Broadleafed forest	
14	Mixed Broadleafed forest	
15	*Daphniphyllum himalayense*	
16	Collinean oak-mixed Broadleafed forest	
17	Deciduous Broadleafed forest (*Alnus, Juglans*)	
18	Hygrophylic *Schima wallichii*	
19	*Schima wallichii, Castanopsis indica* hygrophile	
20	*Schima wallichii, Pinus roxburghii* mesohygrophile	
21	Tropical hill Sal forest in inner valleys	
	Source : BPP 1995, TISC maps 2001	

Rangelands

Livestock farming is an integral part of subsistence farming system in the area. Most of the household in higher altitude like Hatiya, Chepuwa and Kimathanka have livestock farming as the main source of income. Rangeland conditions and forage availability in Makalu-Barun area is relatively better than in many parts of Nepal (Sherpa *et. al* 1990). It is reported that grazing pressure on high altitudes particulary is leading to modification of vegetation cover, one of thenoticable change being the increase in unpalatable species thus increasing threat to the threatened and endemic species (Chaudhary and Vetaas 2002).

Recent landuse pattern (Map 8) shows that there is drastic decline on rangelands in MBNP&BZ (Table 7). It may be a concern for traditional livestock farming in future indicating effective management needs.In the Makalu-Barun area, the grazing lands known as "*Kharka"* are under the *kipat system* (traditional land tenure system). The "*Kharkas*" are controlled by the community of local users and collect fees and charges from non *Kipat* users. In lower belt of BZ,



Map 8 : Land Cover map of MBNP

people practice stall feeding system during cultivation and winter season. Annually, each summer season, nearly 12,000 -13,000 livestock graze in 29 pastures of Barun Valley without paying any fee. There are some user groups of herders for sustainable management and conservation of existing pastures.

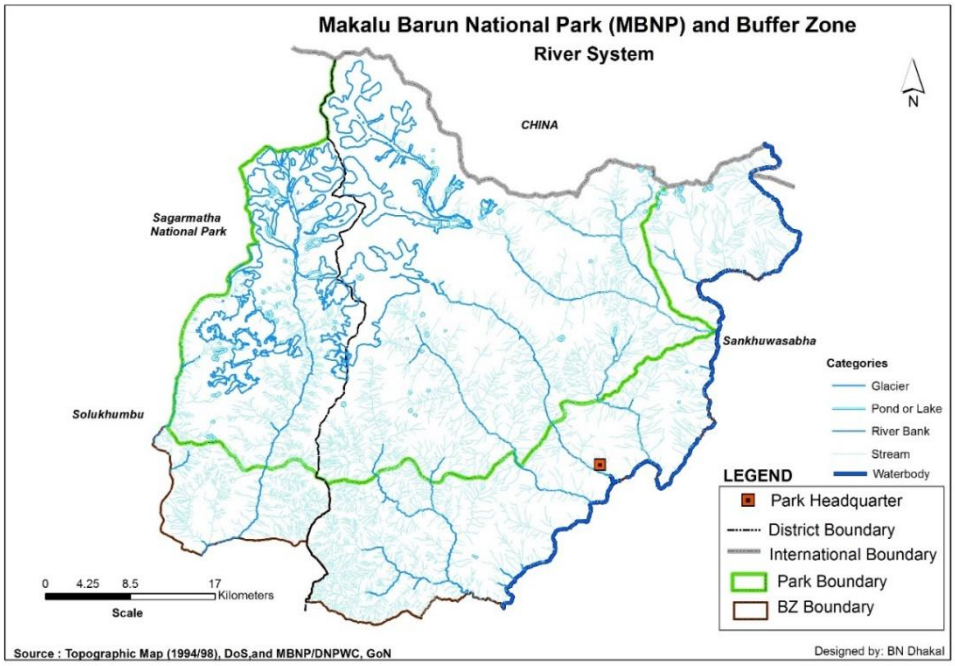
Table 7Land use cover change in MBNP during 1995-2013

S.N.	Land cover class	Area (km^2)		Change in land cover type Area (sq.km)
		1995 AD	2013 AD	
1	Bush/shrub	192	342.84	150.84
2	Cultivated land	94	158.76	64.76
3	Forest land	883	764.21	-118.79
4	Grassland	295	13.55	-281.45

(***Source:*** **Chaudhary and Vetaas 2002, DNPWC 2013**)

Wetlands

Vast quantities of water are stored as snow and glacial ice in the upper elevations of the Park area. Released continuously, the water pours southward, forming seven major river tributaries which pour into the Arun and Dudh Koshi rivers, providing 300 kilometers of riparian habitat. Solukhumbu and Sankhuwasabha districts hold 579 glacial lakes which covers an area of 3.31 km^2 and 13.03 km^2 respectively. Altogether 121 glacial lakes lie inside MBNP (Karki 2002). Groups of alpine, sub-alpine lakes exist in the upper elevations of Park area of Sankhuwasabha and Solukhumbu districts.



Map9 : Wetlands in MBNP

Some of the major high altitude wetlands within MBNP are Bahulaha Pokhari, Yekle Pokhari, Tin Pokhari, Jhale Pokhari, Panch Pokhari (bigger), Panch Pokhari (smaller), Dudh Pokhari, Tama Pokhari, Thulo Pokhari and Sano Pokhari (Jha 2003, Karki 2002, DNPWC 2007).

The Barun Pokhari series includes Barun Pokhari at the base of the Mount Makalu, Lower Barun, Rampuchho and one unnamed lake near base camp. Similarly the Thulo Pokhari series, includes Thulo Pokhari, Sano Pokhari, Bhale Pokhari and one unnamed seasonal Pokhari near Thulo Pokhari (DNPWC and WWF 2007). The major pilgrimage (about 200-300 people) from Makalu rural municipality and other places visit Thulo Pokhari area during July-August in Janaipurnima festival. Mostly Rai, Brahmin and Chhetri worship at Sano Pokhari and Thulo Pokhari, whereas Sherpas worship at Thulo Pokhari. The vegetation of this lake series is represented by dwarf Rhododendron scrub and alpine pasture meadow dominated by *Aconogonum molle, Bergenia purpurascens, Bistorta affinis, Cassiope fastigiata, Juniperus*

recurva, Primula deuteronana, Primula atrodentata, P. microphylla, Rhododendron lepidotum, R. ciliatum and many other species. Six species of bird were recorded around the Barun Pokhari wetland incuding National bird monal with potential breeding population (Table 8).

Table 8: Bird species recorded in and around Barun Pokhari area

S.N.	Common Name	Scientific Name	Most sighting areas
1	Himalayan Snowcock	*Tetraogallus himalayensis*	Base camp
2	Tibetan Partridge	*Perdix hodgsoniae*	Base camp
3	*^ Himalayan Monal	*Lophophorus impejanus*	Yangle-Merek
4	White-capped Water Redstart	*Chaimarrornis leucocephalus*	Barun River
5	Olive-backed Pipit	*Anthus hodgsoni*	Merek
6	Blyth's Pipit	*Anthus godlewskii*	Jack Kharka

^ National bird of Nepal.

*Species which may have significant breeding population in Nepal.

(Source: DNPWC and WWF 2009)

The Panch Pokhari lake (five lakes) series and its core area lie at an altitudinal range of 4,312 m (Hurhure) to 4,122 m (Kholakharka). It is an alpine freshwater oligotrophic lake series illustrating unique natural wetland in high Himlayan Paleoartic biogeograhical region (<www.awsassets.panda.org>). Panch Pokhari represents 5 lakes- "*Bau*" (Father), "*Aamaa*" (Mother), "*Chora*" (Son), "*Buhari*" (Daughter –in –law) and "*Nati*" (Grandson) (Pictures below). The local Kulung names for these lakes are *Umpa Tiu, Umma Tiu, Unchha Tiu, Namne Tiu* and *Chasa Tiu* respectively. This wetland system represents unique assembledge of high altitude flora and fauna. Althogether 32 species of plants were recorded in this wetland complex (Annex 1) include potential endemic plants, Carex himalaica and Ranunculus himalaicus, and threatened species such as Bikh (*Aconitum spicatum*), Pakhanved (*Bergenia ciliata*), Somlata (*Ephedra gerardiana*), Kakoli (*Fritillaria cirrhosa*) and Kyasar (*Meconopsis paniculata*) (Table 2).

Table 9 List of Potential Threatened plants found around the Panch Pokhari area

Species	Local Name	CAMP 2001	CITES 1973	IUCN 1994	Local
Aconitum spicatum	Bikh	+		+	+
Bergenia ciliate	Pakhenved			+	
Ephedra gerardiana	Somlata	+			
Fritillaria cirrhosa	Kakoli	+			
Meconopsis paniculata	Kyashar		+		
Rheum austral	*Padamchal*	+		+	

(Source: DNPWC and WWF 2009)

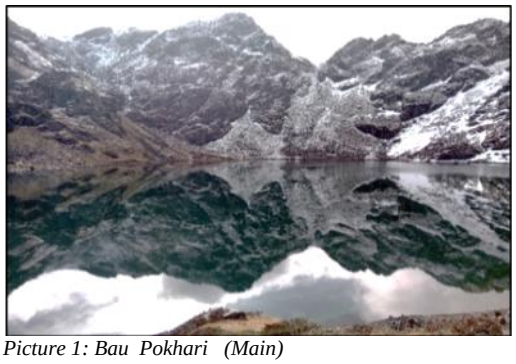
This area also harbors three wetland species and 26 wetland dependent species of birds (Table 3). The lake area is the habitat for endangered species like musk deer (*Moschus chrysogaster*), and snow leopard (*Uncia uncia*).

Table 10 Birds observed in and around Panch Pokhari area, MBNP

SN	Common name	Scientific name	Area of sighting
1.	Robin Accentor	*Prunella rebeculoides*	Pokhari area
2.	White winged Redstart	*Phoenicurus erythrogaster*	
3.	Pink-browed Rosefinch	*Carpodacus rhodochrous*	
4.	Spot-winged Rosefinch	*Carpodacus rhodopeplus*	
5.	Yellow- billed Chough	*Pyrrhocorax graculus*	
6.	Wren Babbler	*Pnoepyga immaculata*	
7.	Himalayan Monal	*Lophorous impejanus*	

(Source: DNPWC and WWF 2009)

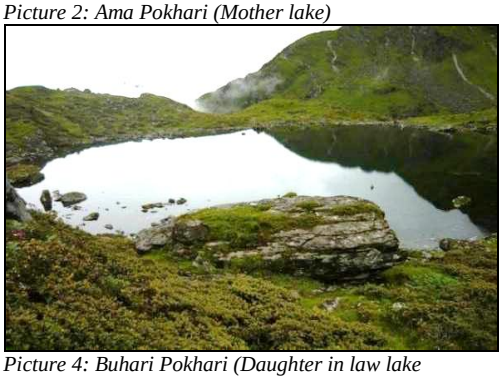
Major issues of the wetland ecosystem include encroachment, increasing number of illegally constructed lodges, fires and pollution which are associated with the increasing number of tourists at Mera peak area (Naulekh) (DNPWC & WWF 2009). Similarly, core area of this wetland complex is threatened due to traditional grazing practices, and extraction of medicinal and aromatic plants (MAPs). Though number of cattle is decreasing at vicinity of the lake, grazing system is not regularized and most of the shepherds construct their *goths* affecting the fragile landscape (DNPWC and WWF 2009). Local people collect MAPs from surrounding area of lake for their own personnel use. Major plant species that are collected include YarshaGumba (*Ophiocordyceps sinensis*), Padamchal (*Rheum nobile)*, Panchaule (*Dactylorhiza hatagirea*), Pakhanved (*Bergenia ciliata*) and Maikopila (*Saussurea tridactyla*).



Picture 1: Bau Pokhari (Main)

Picture 2: Ama Pokhari (Mother lake)

Picture 3: Chhora Pokhari (Son lake)



Picture 4: Buhari Pokhari (Daughter in law lake

2.8.2 Floral diversity

More than 3000 species of flowering plants are reported from Park & BZ areas. The Park is famous for *Rhododendron* and orchid diversity. It harbors 25 species of Rhododendrons out of 31 species reported from Nepal and 107 species of orchids (Karkee 2008). The common orchid species found in MBNP & BZ area include*Coelogyne cristata, C. corymbosa, C. fuscescens, Dendrobium densiflorum, D. heterocarpum* etc. Similarly, there are records of 48 species of Primerose, 19 species of Bamboo (*Arundinaria spps* and *Drepanostachyum spps*), 15 species of Oak, 86 species of fodder trees and 87 species of medicinal plants. Out of 128 species of pteridophytes recorded in the Park, 29 species are economically important (5 edible, 14 medicinal and 10 for miscellaneous purposes) (Baral 2003). Fibre making is a well known cottage industry in Makau-Barun region. Fibre plants *Girardinia diversifolia, Daphne bholua, D. papyracea,* and *Edgeworthia gardnerii* widely occur in this area

Box 3. Species diversity in MBNP and BZ

Vascular plants	
Lichen	78* species
Pteridophytes	128* species
Mammals	88* species
Birds	433* species
Reptiles	43 species
Amphibians	16 species
Herpetofauna	54*/14 species
Fish	78*/13 species
Butterflies	315* species
Bat	20 species

***** Compiled by Chaudhary and Vetaas 2002

(Chaudhary and Vetaas 2002)

A total of 18 species of vascular plants are reported to be endemic form MBNP area. *Gnetum montanum* (IUCN endangered species) in Seduwa in the low altitude Arun Valley, *Tetracentron sinense* (IUCN endangered species) and several *Rhododendron species*, *Larix griffithiana*, *Magnolia globosa*are some of the rare and endangered flora found in Makalu-Barun National Park. Plants like *Swertia Barunensis* (4200m) and *Potentilla Makaluensis* (4000 m) nomenclatured under the name of river Barun and Mt. Makalu are found only in this area in the entire world.Similary, out of 17 protected plant species, 15 are reported from the Park area some of which are *Abies spectabilis, Cinnamomum glaucescens, Shorea robusta, Dactyloriza hatagirea,* Lichens, *Nardostachys grandiflora, Taxus wallichiana, Valeriana jatamansii*and *Neopicrorhizia scrophulariiflora. Similarly,* a total of 52 species of higher plants recorded from the Park fall under CITES appendices few of them are *Podophyllum hexandrum Gnetum montanum, Dioscorea deltoidea, Orchidaceae* (Orchids), *Taxus walichiana* etc. The occurrence of invasive plant species have also been reported from the Park area. The commonly occuring species are Eupatorium odoratum, E. adenophorum, and Lantana *camara,* which were found dominant on the slash and burn sites (Chaudhary and Vetaas 2002).

2.8.3 Faunal diversity

So far,88 species of mammals, 367 species birds, 43 species of reptiles, 16 species of amphibians, 315 species of butterflies, and 13 species of fish have been reported from the MBNP & BZ(Box 3). The symbolic bird species of the park include the Spiny babbler, Impeyan pheasant, Rufous throated Wren Babbler, and Slety-bellied Tesia (Bhuju *et. al* 2007) and those of mammal include the Snow leopard, Musk deer, Red panda, Clouded leopard, Asiatic golden cat, Himalayan Black Bear, Grey wolf, Ghoral, Himalayan thar, Common leopard, Leopard cat, Assamese Monkey and Indian Pangolin. In addition to these, more substantial populations of Wild boar, Barking deer, and Himalayan serow are found in MBNP & BZ.Asiatic golden cat (*Pardofelis temmincki*) was recorded in the park at an altitude of 2,517 m asl after 178 years (Ghimire and Pal 2009) from camera trapping in 2009 AD. Leopard cat was also photographed by camera trap at the highest altitude so far in MBNP (at an altitude of 3,254) in Saldima valley at upper temperate forest in 2010 AD(Ghimire and Ghimire 2010). Indirect evidence suggested that Jungle cat and Common leopard are present but both are threatened due to conflict with humans. About 20 species of bats were recorded from the area, of which 12 were confirmed to the species level. Generally people have a negative perception towards the bat fauna suggesting the need for strong awareness programs.

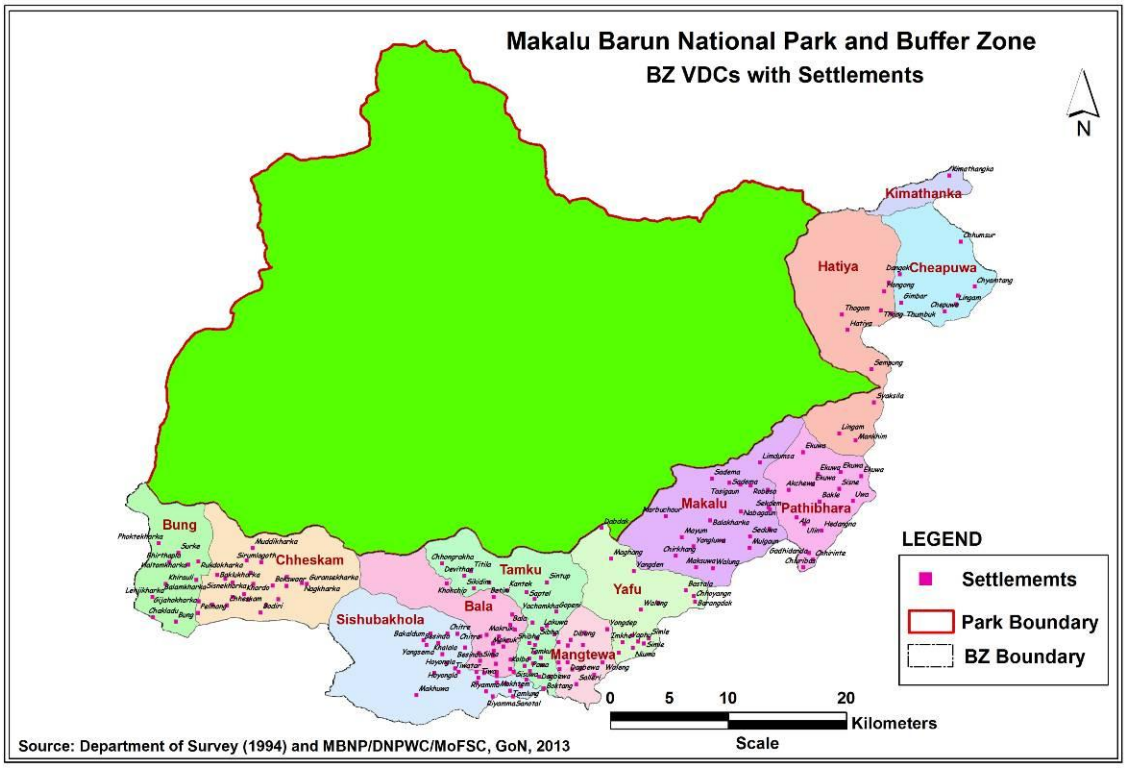
The presence of Red panda has been confirmed in 24 districts of Nepal, including Solukhumbu and Sankhuwasbha (Jnawali et al. 2012). Based on the distribution of Red panda in Nepal, there are six complexes, with major population complexes and their respective sub-populations have been cited in Eastern Complex: Makalu Sagarmatha Complex (MBNP, SNP and surrounding

areas).

Tite machha or bitter fish (*Psilorhynchus pseudocheneis*) is a endemic fish species to MBNP, whereas the Spiny Babbler (*Turdoides nipalensis*) endemic bird to Nepal, is also found in the Park area (Bhuju *et al.* 2007). The Green cochoa (*Cochoa viridis*) which is listed in National Red Data Book is already listed in the bird checklist of MBNP (Bhuju *et al.* 2007). 24 species of mammals found in MBNP are listed in CITES appendices and 11 species of mammals and three species of birds are protected by NPWC Act 1973.

2.9 Institutional Attributes

Buffer zone area of MBNP covers 3 Rural Municipalities of Sankhuwasabha and one Rural Municipality of Solukhumbu districts. BZ institutions including one BZ management committee, 12 BZ user committees, and 95 BZ user groups are contributing to conservation and management of natural resources in close collaboration with the park. Besides, few NGOs/CBOs are working in conservation and community development in coordination with the park.



Map10: Park and BZ Rural municipalities with settlements in MBNP/BZ

Table 11. Stakeholders in MBNP

Name of institutions	Major Activities
Community based organizations: BZMC (1), BZUCs (12), and BZUGs (89): 3 Rural municipalities of Sankhuwasabha and 1 Rural municipality of Solukhumbhu	Natural resource management and sustainable use; conservation and community development; supply of forest products; tourism promotion
NGOs directly working in conservation ECO-HIMAL, Himalayan Natural Fiber Foundation (HNFF), The East Foundation, Sankhuwasabha Development Society (SODEC), Rural Reconstruction Nepal (RRN), NGO Federation, Himali Project	Conservation education and awareness raising; income generation and livelihood enhancement; technology transfer; capacity development; community forest management; community development; infrastructure development; disaster preparedness; advocacy and networking among CSOs; institutional development support to CSOs; good governance and NGO management; agriculture and livestock development; enterprise development
Cooperatives	Saving and credit management; collective enterprise and action; economic development
Sectoral Line Agencies	Sectoral service delivery and development

(*Source: SCDNPWC Report 2013 Task 3.3*)

CHAPTER 3 – PAST MANAGEMENT AND PRESENT MANAGEMENT PRACTICES

3.1 Conservation History

The unique biodiversity present here was first discovered by the team of Nepalese and American Scientist who arrived here for the study of Himalayan Black Bear in 2040 BS. On their recommendation the then, member of Nepal Academy Science and Technology (NAST),Dr. Tirtha Bahadur Shrestha took initiation to make this pristine area into protected area. In 2043 BS the research team of Woodland Mountain Institute proposed an operational plan in an international forum. As a result, a 10-day seminar, historically known as "Saldima Seminar" was organized in Saldima Valley; chief guest being the then King Birendra and other guests being high ranked officials of Nepal, academic professionals and conservation scholars from national and international arena. The next year, in the end of 2044 BS,DNPWC and TMI signed an agreement to organize **Makalu Barun Conservation Area Project (MBCAP)**and in August 29, 1988 AD(Bhadra 13,2045 BS) TMI signed a contract with DNPWC to support conservation programs in this area. Finally in November 18, 1991 AD (Mangsir 2, 2048) the establishment of Makalu Barun National Park and Conservation Area was formally announced. The BZ of MBNP was declared on Feb10, 1999 AD (Magh25, 2055 BS)which was previously managed asconservation area.

The first management plan of the park and then conservation area was prepared in November of 1990 AD. The plan was based on a two year preparatory study conducted by MBCAP task force, with priority activities to be implemented for 10 years from 1991 AD to 2000 AD. The plan then called for the establishment of NP (1500 km2) and conservation area (830 km2). Establishment of strict nature preserves, protected area and special sites and trails were also proposed.

3.2 Park Protection

Long before the declaration of MBNP and BZ area the indigenous people living in the area had been practicing illegal poaching and haphazard collection and harvesting of trees and Non-Timber Forest Products (NTFPs) for timber, fuelwood and illegal trade of NTFPs. The grazing lands known as Kharkas were under the Kipat System (traditional land tenure system). After the establishment of MBNP in 1991, the illegal activities were started to be controlled. Regular patrolling effort from Park staffs of Sector and Posts of the Park was the major meansfor ensuringthe protection of the Park. Bhim Kali Company of Nepal Army (NA) was deployed after the decision of Council of Ministers in Asoj 1, 2072 B.S.,for assisting the Park officials in biodiversity and wildlife conservation.Joint operations like Short range Patrolling, Long range patrolling and Check Post establishment has played an important role in controlling anti-poaching activities through out the Park. Recent increase in number of wildlife crime related cases registered in Park office is a good indicator of success in anti-poaching sector.

3.3 Habitat Management

To preserve the pristine and undisturbed habitat in the park, management of forests, rangelands and wetlands are generally at the protection level with very few habitat management interventions. The main focus of habitat management in MBNP has been to maintain wilderness and reduce anthropogenic pressure such as unsystematic collection of forest products and unregulated grazing in rangelands. Garbage management is another important activity under habitat management which not only helps in keeping rangeland and other wildlife habitat clean but also helps in controlling pollution in wetlands. Forest fire is another threat to wildlife habitat as frequent accidental fire deteriorates the wildlife habitats in the Park. Conservation education programmes aiming at raising awareness of local people in biodiversity and habitat conservation include school education, celebration of special wildlife related days and weeks, and construction of sign posts/display boards in different places of trekking routes.

3.4 Anti-poaching activities

The upper area of the Park is home for many rare and endangered wildlife species. Occasional reports of poachers killing game animals like Himalyan Thar, Barking Deer, Musk Deer, Red Panda and Wild boar using traps and guns has been recorded in the past. The Park area covers large area with irregular terrain and high elevations making it challenging for Park staffs to patrol the area throughout regularly. Currently, possible routes which could be used by poachers are identified annually and patrolling is carried out.

In order to make anti-poaching operations more effective, district level Wildlife Crime Control Bureau (WCCB) has been formed for Sankhuwasabha district coordinated by CCO of MBNP. The Bureau comprises of officers representing from District Administrative Office, District Police Office, Armed Police Office, District Level National Investigation Office, District Attorney Office, District Forest Office and other relevant government offices as well.

Intelligence gathering is a prime step towards an effective anti-poaching operation. In order to curb poaching of wildlife species and illegal trade of their body parts, MBNP has recently established Community Based Anti-Poaching Unit (CBAPU) under six BZUCs. These CBAPUs organize regular activities to combat poaching and sharing information. However, there is still a need of informants' network to gather reliable information regarding the possible wildlife crimes in the Park area. MBNP needs to form Anti-Poaching Unit (APU) and strengthen informants' network to obtain trustworthy information for effective anti-poaching operations.

For all the contraband including wildlife and plant parts, one major international trade route along the MBNP has been identified; that is Kimathanka. However, an alternative route very close to Kimathanka is through Riddhak, which is outside the MBNP area and is highly suspected route for the illegal trade of wildlife parts. Biratnagar-Kimathanka North South Highway is under construction and track is supposed to be inaugurated within a few years. This

makes Kimathanka and Riddhak highly potential for the smugglers thus strict measures and presence of security check posts is indispensable.

3.5 Tourism and Interpretation

MBNP and BZ is one of the high potential areas for foreign visitors due to its unique cultural and pristine natural environment with high snowey mountainsand its closeness to Sagarmatha National park in the west. Trekking and Mountaineering are the major tourist attractions of the Park. The steep terrain, difficult trails and bridges are suitable for most adventurous trekkers or visitors. However limited transportation, communication and accommodation facilities are hindering the tourism development in MBNP and BZ.

The prominent trekking route in the MBNP goes all the way from Tumlingtar to Bumlingtar-Tashi gaon up to Makalu base camp. The major tourism destinations within Park area are Makalu, Khempalung, Shiva-Parbati Gupha, Saisima Valley, Saldima Valley, Panch Pokhari complex, Sankhuwa Ice Lake, Yarsa Monastery, Mera Peak (La), and Kulung, Yamphu Rai, Sherpa and Bhotiya culture sites.

Mountaineering expedition is another attraction of this area. Mt. Makalu, Mera La, Chamlang and Baruntse are the major destinations for expedition. Number of expedition team is not so significant in the area (38-40 expeditions till now) though there is high potentiality of increasing such expeditions, once the tourism facility and services are improved.

All BZ settlements lies in remote parts of the park with limited access to services, even the access of cell phone is not available in most of the VDCs. However, the BZ communities have higher potentiality of initiating heritage tourism by diversifying cultural heritage products.

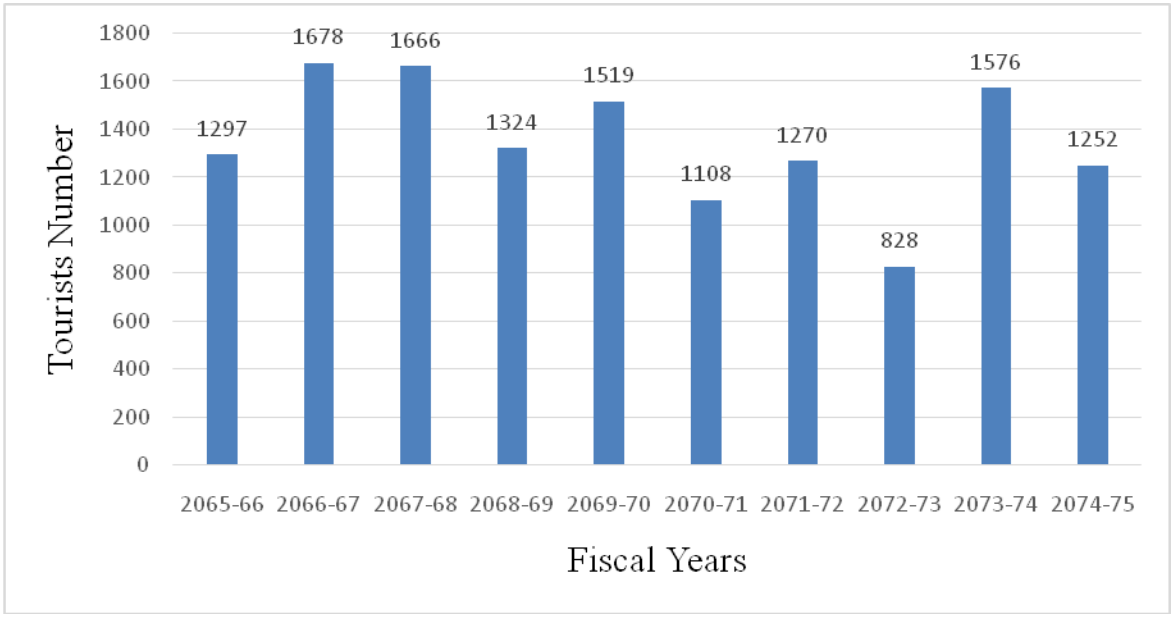
Though MBNP is less popular for tourists as compared to other protected areas of Nepal, tourism is the major source revenue collection.Mera Peak region is the main tourist destination accounting for more than 70 percent of tourists visiting the Parkdue to its proximity to Mt. Sagarmatha. The number of tourists visiting the Makalu Base Camp route is very low compared to that ofMera Peak Region.The Park lacks ticket counters, visitor centers and museums for tourism interpretation. Inadequate number of tea shops, hotels, lodges and small restaurants and garbage management are major challenges for tourism development in the Park.

The major trekking routes identified in MBNP area are as follows (also includes places outside MBNP that are connected to the route and final destination) :

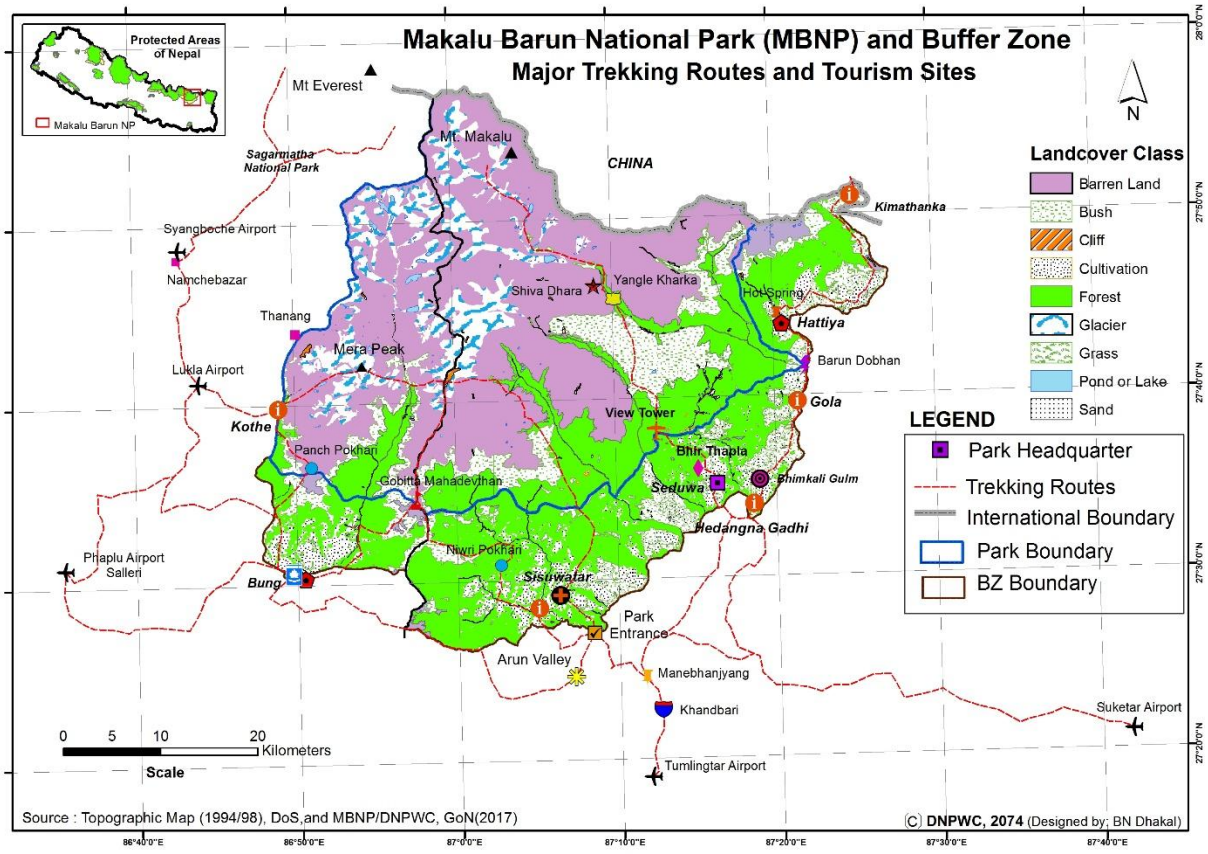
- Destination: Mera Peak;
  - Lukla – Kothe – Thankgnak – Khare – Mera.
- Destination: Mera Peak;
  - Tumlingtar – Gothe Bazar – Fedi – Jaubari – Guranse– Sanam – Gudel – Bung – Khiraule – Charakhor –Cholem – Kothe – Thankgnak – Khare – Mera.

- Destination: Makalu Base Camp;
  - Tumlingtar – Khandbari – Num – Seduwa – Tashi Gaun – Khongma – Thulo Danda – Dobate – Yangle Kharka – Yak Kharka – Langmale – Makalu Base Camp.
- Destination: Makalu Base Camp;
  - KCA – Thudam – Chepuwa – Hatiiya –Syaksila – Paireni Kharka – Chamlima – Bagare Odhar – Yangle Kharka – Yak Kharka – Langmale – Makalu Base Camp.

There are records of average 1352 international visitors during last ten years from FY 2065/66 to 2074/75 illustrated below .



Map11: Number of foreign visitors in MBNP (2065-66/2074-75; Source: MBNP 2075)



Map12 Major tourist route and tourist site in MBNP

Currently, out of 91non registered illegal tea shops, lodges and small restaurants operating in Park area 77 are in Mera Peak area and 14 are in Makalu area. The details about those tea shops, lodges and small restaurantscurrently in operation are in Annex 9.The guideline for hotel registration in Park area is in due process.

3.6 Research and Monitoring

3.6.1 Research

As per research protocol, a researcher requires an approval letter fron DNPWC, prior to conducting nay kinds of research works inside the Park area. However, students from Nepal can carry out research works with the permission of particular Protected Area (PA). Each researcher is also required to submit hard copy and soft copy of their research reports to Park authority. Before the declaration of MBNP, various national and international scientific studies had been carried out in MBNP before 1996. Since then, due to the inadequate funding sources and less interest of researchers, research activities are quite limited inside MBNP. Most of the reports of the studies are not submitted to MBNP office. Some of the known researches are listed below in Annex 14.

3.6.2 Monitoring

Monitoring is a regular phenomenon which is carried out on a regular basis. Central and park level monitoring are carried out by DNPWC and Park office regularly for protection of rare/endangered flora and fauna. They monitor development work, ecotourism promotion activities, habitat management and community mobilization programs.

Long, medium and short-range patrols are jointly carried out by Park staffs and NA inside Park area to curb poaching activities. CCO and corresponding NA company commander visit Park security check posts and posts separately or jointly for periodic monitoring. A monthly, quarterly and annual progress reports are sent to DNPWC.

3.7 Human-Wildlife Conflict

Human Wildlife Conflict (HWC) is a prominent issue in the park and it's BZ. There arefew reported cases casualties (killing and injury), retaliatory killings of wildlife by the people, however crop raiding by wildlife is common. Himalayan black Bear, Barking deer, Assamese monkey and Rhesus monkey are major animals associated with Crop raiding in BZ area. Few incidents of livestock depredationduring grazing season by Snow leopard, Himalayan black bear, Common leopard and Grey wolf in Kharkas located in high elevations are reported occasionally. Moreover, encounters of people with Himalayan black bear has increased recently.In recent years, HWC is becoming one of the major hindering factor for maintaining harmonious relationships with local people and increase their participation in conservation.

Although relief policy has been formulated and with three amendments till 2074 B.S. (2017 AD), latest amendment increased relief fund to NRs. 10,00,000.00 (Ten Lakhs) to the victim’s family in case of death of human being by wildlife outside the PA. Similarly, provisions for relief fund upto NRs. 30,000.00 (Thirty Thousands) for livestock depredation and upto NRs. 10,000.00 (Ten Thousands) for crop raiding are also made in the policy. But lack of provision for relief fund for crop damage caused by Himalayan black Bear, Barking deer, Assamese monkey and Rhesus monkey in the policy has made it difficult to reconcile cooperation with local people. All the cases that are reported to MBNP have been presented in Annex 12.

3.8 Administration and Organization

The administration of the Park is headed by CCO who is stationed in the headquarters at Seduwa, Sankhuwasabha. Under CCO, there are five ACOs who are responsible to lead four Sector Offices located at Hattiya, Seduwa and Tamku of Sankhuwasabha district and at Bung in Solukhumbhu district and one ACO heads the Buffer Zone and Monitoring section in the Park headquarters. These sectors implement administrative and technical task assigned by headquarter. The ACOs are supported by rangers, who supervises rangeposts, communicate with communities and implement Park’s activities. The smallest administration unit of the Park is

Guard Post, managed by Senior Game Scout, which delivers the works assigned by Sector Offices. The organogram of MBNP is presented in Annex 10.

Similarly, there is also a BZMC to coordinate and implement BZ program. The BZMC manages the fund received as per the BZ regulation as envisioned in NPWC Act, 2029. There are 12 BZUCs under the BZMC in Makalu Barun NP.

In addition, for park security, a company of NA has been deployed. The company, headed by a Major, has its headquarters at Hedangna Gadi and there are altogether two security posts at Tamku and Hattiya respectively. The number of security posts need to be increased as per the need considering the emerging issues and challenges of Park management.

3.9 Achievements of Preceding Management Plan

A five year Buffer Zone Management Plan was prepared in in 2063 BS (2008 AD). Though no report exists on the evaluation of that plan, a numbers of achievements have been accomplished which were identified on that plan. Some of the major ones are listed below:

- Trail improvements in various areas of buffer zone;
- Drinking water maintenance at various places of MBNP and BZ;
- Religious sites conservation in different BZUCs;
- Awareness activities and conservation extension to different groups;
- Trainings on income generation and community forest management.

3.10 Strength Weakness Opportunity Threat (SWOT) Analysis

Strength:

- Category II protected area
- Vast altitudinal range from tropical to nival within a short distance
- Presence of diverse ecosystem and biodiversity
- People participation in protection

Weakness:

- Site-specific tourism and issues regarding equitable tourism benefits;
- Limited access to the Park;
- High resource dependency of the local people;
- InsufficientPark infrastructures
- Low collection of revenue
- Inadequate number of staff for execution ofdaily and emergency activities.

Opportunities:

- Diversification of tourism and involvement of the local people in such enterprises;

- Opportunities for research through collaboration at different levels;
- Involvement of local people in tourism industry
- Potential for self-reliance of the resources required for conservation fromeco-tourism
- Payment for ecosystem services

Threats:

- Poaching continues to be a threat as market value for illegal wildlife parts exists;
- Habitat loss and fragmentation due to encroachment in BZ and Park area;
- Unregulated and concentrated tourism;
- Traditional resource dependency of the local people;
- Potential impact of climate change such as glacier retreat and GLOF on biodiversity conservation and livelihood of the local communities.
- International border and an access makes this PA prone to wildlife crime
- Possibilities of natural disasters like landslide, lake burst and flood regularly
- Impact due to infrastructural development from hydropower, highwayand transmission lines.

PART B- THE PROPOSED MANAGEMENT

CHAPTER 4 – VISION, GOAL AND OBJECTIVES

4.1 Vision Statement

Makalu Barun National Park along with its Buffer Zone is visualized as an area of representativeexample of unique biodiversity in the Eastern Himalayan Region of Nepal which is managed to enhance theunique biodiversity and maintain outstanding universal value of the area with active community participation that eventually supports for the welfare of human being in perpetuity.

4.2 Management Goal

To conserve and maintain the unique biological and cultural values, and scenic beauty for the benefit of the present and future generations primarily as sources of inspiration, recreation, education and glory; and to support livelihoods of the local people by securing sustained quality ecosystem services in a manner that maintains ecological integrity.

4.3 Management Objectives

The main objective is to enhance biodiversity of the park, promote ecotourism and regulate it to maintain balance between conservation and tourism and also support livelihoods of local community through effective management of natural and cultural heritage. The specific objectives include:

I. To conserve biodiversity with special focus on globally threatened and nationally protected wildlife and their habitats in order to maintain ecological functions and processes;
II. To promote sustainable tourism for inspirational, educational, cultural and recreational purposes;
III. To strengthen institutional capacity through research, PES, capacity building, coordination and collaboration.

4.4 Major challenges in achieving Objectives

Several challenges exist for achieving the stated objectives. Some of themthat may impede accomplishment of the above-mentioned objectives are as identified below:

Objective I

To conserve biodiversity with special focus on globally threatened and nationally protected wildlife and their habitat;

- Encroachment of forest due to slash and burn practices for shifting cultivation still exists
- Illegal firewood collection for cattle sheds in grazing sites and tourism business along the major trails leading to Mera La, Makalu base camp, Panchpokhari, Thulopokhari are increasing;
- Grazing activity is not regularized and most of the shephards construct their hut (Goth) in the core area that affecting fragile landscape (DNPWC and WWF, 2009)
- Major wetlands such as Panchpokhari and Thulo-pokhari of religious value in high pastures are polluted by solid wastes and religious activities
- Inadequate research, monitoring and baseline data;
- Poaching of important species like Snow leopard, Clouded leopard, Musk deer, Red panda, Himalayan black bear for contraband;
- Encroachment by alien and invasive species (AIS);
- Gradually intensifying pressure from tourism activities in certain areas of the park that obstacles maintenance ofnatural properties;
- Limited accessibility in the park;
- Harsh climatic condition that hinders staffs' mobility for park patrolling;
- Insufficient motivation and incentive for park staff to work in recognized inflexible conditions;
- Inadequate geographical and ecological information based on science;
- Insufficiency of infrastructure and limited budget for its maintenance;
- Inadequate budget for park protection activities;
- Poor trans-boundary cooperation with QNR, TAR of China;
- Traditional values and beliefs of local people that leads to high resource dependency in andaround the park;

Objective II

To promote sustainable tourism for inspirational, educational, cultural and recreational purposes;

- Increased disturbance to the wildlife species and their habitats from tourism;
- Lack of coordination between tourism related stakeholders;
- Unregulated and limited tourism activities in the park;
- Tourism opportunities not adequately explored;
- Insufficient infrastructures for tourism;
- Lack of control mechanism for the disturbance caused to wildlife and their habitat from existing tourism activities like garbage, helicopter noise, etc;
- Problems in solid waste management caused directly or indirectly by tourism;
- No interpretation facilities in the park;

- Limited conservation awareness programme for local community and visitors.

Objective III

To strengthen institutional capacity through research, PES, capacity building, coordination and collaboration.

- Inadequate co-ordination and collaboration with universities, research institutions,conservation partners and development partners;
- Paucity of well-timed plan and implementation of activities;
- Lack of research prioritization;
- Inadequate linkages between research and management needs;
- Limited budget for ecological monitoring and research;
- Inadequate awareness on climate change and PES;
- Inadequate adaptive and mitigation plan;
- Insufficient trainings on capacity building to staff and local representatives of BZMC, BZUC and BZUGs;
- Inadequate plan and adequate fund for training and exposure visit;
- Insufficient incentives, rewards, amenities and welfare for staff motivation.
- Immature professional and institutional capacity in BZUC and BZUGs;

CHAPTER 5 – MANAGEMENT STRATEGIES

5.1 Boundaries (Legal, Administrative, Ecological)

Legal

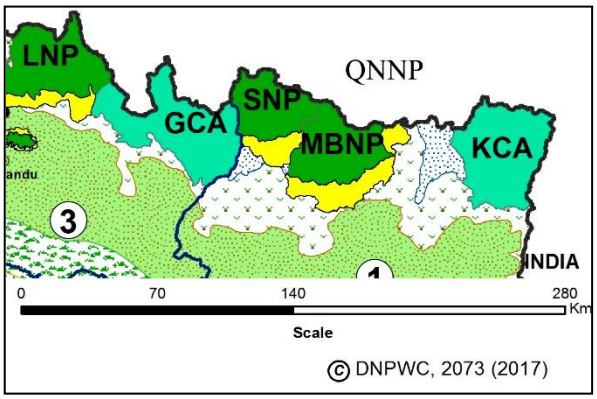
Makalu National Park (1,500 sq.km.) and its Buffer Zone (830 sq.km.) were declared according to the National Parks and Wildlife Conservation Act, 1973. Though the boundary of Makalu Barun National Park and its Buffer Zone is well defined and duly notified with the publication in Nepal gazette, boundariesof Core area and BZ area at some places are hard to differentiate. There is need of clear boundary demarcation between BZ and Core area of the Park. A small village named Saisima, which is inhabited by monks and nuns, lies inside the Core areaof the Park. Gazette of the park declaration in illustrated in Annex 11.

Administrative

The Park is headed by CCO (under-secretary level), who is stationed in the headquarters (HQ) at Seduwa and is responsible for overall management of the Park. The headquarters of the Park has technical, administration, financial, BZ and Legal section. As per new organization and management structure, there are 5 Sector Offices, 2 Range Posts and 6 Guard Posts which is insufficient for protection and management Park and BZ area of 2330 km^2. Due to vacant positions of staffs Mera Peak Sector and 3 other Posts have not been able to function properly. Fulfillment of vacant positions of staffs and increase in number of staffs and Posts will be the main administrative focus in future.

Ecological

MBNP itself is an ecological unit in one of the highest region of the world. The Park and its buffer zone (2,330 sq.km.) has a landscape contiguous with SNP and its Buffer Zone (1,423 sq.km.) to the west and QNP (35,000 km2) in Tibet to the north.Though not connected, KCA (2,035 sq.km.) is situated very close in the eastern side of MBNP. The combined area of these PAs forms one of the largest protected area complexes in high mountain ecosystem. The Sacred Himalayan Landscape (SHL) also includes MBNP as one of its major PAs. Therefore, MBNP along with surrounding landscape is considered to be ecologically inclusive and needs cooperation between Nepal



Map 13: Ecological features of MBNP

and China to conserve biodiversity at transboundary landscape level.

5.2 Zonation (Management Facility Zone, Utility Zone, CoreZone)

Zonation is a management tool that enables the spatial management of a PA that has to achieve both protection of the area's key ecological features and sensitive habitats, sustainable utilization of the landscape for tourism and other non-materially altered purposes. Zonation allows managers to achieve different management aims in different parts of the PA. Zoning also provides a framework for planning by designating zones with different management objectives and allowable human impacts. This ensures a balance/trade-off between conservation and development objectives. It allows the planners to focus proposed conservation and development activities and resources on different zones depending on management objectives of specific sites within the PA. The use of this methodology will enhance conservation planning by ensuring effective conservation and development. In order for managers to achieve different management objectives in different parts of the Park, five main zone types have been identified.

5.2.1. Strict Nature ReserveZone (IUCN Ia category)

The upper part of Park area including historical and pristine Saldima valley, Barun valley is proposed as a Strict Nature Reserve (IUCN Ia category). The rationale, objectives and management approach for managing this zone as strict nature reserve modality is described below briefly.

Rationale

1. The government designated the national park in an area free of human settlements with no historic records of human residence inside the Park area due to which these areas are not liable to any form of human activity and interventions.
2. The Zonetreasures some of the last remaining pristine forests and alpine meadows in the world. The landscape consists of mountain peaks, glaciers, high altitude lakes, pastures, forests and rivers. Due to rough and irregular terrain these areas are still intact and undiscovered. So, these areas have high biodiversity conservation values because of their undisturbedhigh mountain geological/geomorphological features, ecology and landscapes.
3. Trans-boundary linkage with Qomolangma National Park of Tibetan Autonomous Region of China in the North and Sagarmatha National Park in the West can only be achieved by protecting these areas strictly.
4. This Zone covers 3 terrestrial eco-regions out of 4 terrestrial eco-regions of MBNP, namely (i) The Eastern Himalayan Broadleaf Forests, (ii) Eastern Himalayan Conifer Forests and (iii) Eastern Himalayan Alpine Shrub and Meadows.
5. The skyline is a panorama of rugged Himalayan peaks including Mt. Makalu (8463m), the fifth highest mountain in the world and fourth highest in Nepal; Mt. Chamlang

(7319m), Mt. Baruntse (7129m), and Mera Peak (6654m); Mt Makalu is the Park's major landmark.

6. Situated in one of the highest regions of the world, the Park area is of significant scientific value and offers unique research opportunities to scientists. As very few studies and researchs are carried out in these areas very little is known about the ecological and biological values.
7. Saldima valley, Barun valley, Sankhuwasir valley, Isuwa valley, Apsuwa valley, Hongu valley, Inku valley, Saisima area, Khempalung area, Kal pokhari, Panch pokhari, Khola kharka valley, Khongma Dingmavalley are considered to be of global significance, and can act as a living laboratory for international scientific research. Plants like *Swertia Barunensis* (4200m) and *Potentilla Makaluensis* (4000 m) nomenclatured under the name of river Barun and Mt. Makalu are endemic to Barun Valley.
8. The area provides habitats for rare and endangered species such as Snow leopard (*Uncia uncia*), Clouded leopard (*Neofelis nebulosa*), Asiatic golden cat, Leopard cat (*Felis bengalensis*), Red panda (*Ailurus fulgens*), Musk deer (*Moschus chrysogaster*), Grey wolf (*Canis lupus*), Wild dogs, Himalayan Black bear (*Selenarctos thibetanus*), Common leopard (*Panthera pardus*), Jackal (*Canis aureus*), Himalayan Thar (*Hemitragus jemlahicus*),and Goral (*Nemorhaedus goral*), most of which are on the CITES list and also protected by government.
9. The glaciers and lakes inside thesePark areas are of high hydrological value for wildlife and downstream communities. Several rivers originating and flowing throughthe Park area support diverse aquatic ecosystems home for endemic and rare amphibians and Pisces.
10. Many vulnerable glaciers, glacial lakes and ecosystems due to climate change are situated inside the proposed zone whose credibility can be restored with minimal management intervention.

Main management Objectives

1. Total priority will be given for conservation of species, habitats, ecosystems, landforms and landscapes.
2. Will be developed as a baseline monitoring site for monitoring the relative impact of human activities in PAs. Only limited,nondestructive, management orientedmonitoring, and research will be allowed inside the Zone.
3. All kinds of humans' visitation other than stated in point no. 2 will be restricted.
4. Natural ecological processes will be maintained with minimal management intervention and without infrastructure development.

Management approach

1. Total protection of the zone through patrol, enforcement and monitoring.
2. Absence of any facilities that would assist access or use.

5.2.2. Core Zone

The area of the national park apart from facility zone, utility zone and BZ are set out as core area. It is wilderness area which include all parts of the Park including mountain Peaks. The key objective of this zone is protection and maintainance of the natural state of the ecosystems and provide suitable habitat for wildlife and to encourage research and science-basedmanagement intervention.

5.2.3. Utility Zone

This is an area of the Park allocated for limited recreational activities for the visitors along with nature interpretation services for conservation awareness. This includes hotels and campsites, religious sites trekking routes and public work installation areas.The main objective of managing this zone is to regulate tourism in the core area to minimizethe disturbance towildlife and its habitat and to enhance visitors' satisfaction throughproviding wilderness experience.

5.2.4. Management Facility Zone

This is the zone inside the Park occupied by the infrastructures developed for office and accommodation for park staff and army personnel. It comprises area occupied by the head office of the Park and NA together with Sector, Rangeposts and Guard posts established at strategic locations. This zone also includes the administrative, museum, interpretation and law enforcement facilities provided to the local people, researchers and visitors.

5.2.5. Buffer Zone

This is the area outside of the core area which includes all the settlements and private lands, where environment-friendly development activities will be carried out to reduce dependency of people on forest resources of the core area and improve livelihood of local people living in the area through economic benefit sharing earned by the Park as per provision of the NPWC Act, 2029.

5.3 Theme Plans

5.3.1. Protection and Biodiversity conservation

5.3.1.1. Park protection

5.3.1.1.1. Status

Park protection is one of the most important activities of entire Park management. NA has been deployed for protection through enforcement of NPWC Act, 2029 and subsequent conservation legislation. The Company is headed by Major and served by total strength of Army in various positions deployed under the Company commander who is responsible to National Parks and Wildlife Protection Directorate of NA headquarters. The Company was deployed in June 2, 2016 AD (Jestha 20, 2073 B.S.) for park protection. It has its headquarters at Hedangna Gadhi and two security posts at Tamku and Hattiya. Patrolling is done entirely on foot or by using motorcycle or park vehicle depending upon the situation and site of patrolling. At the headquarters, the CCO

bears overall responsibility to coordinate with Company commander for effective law enforcement.

5.3.1.1.2. Issues

- Inadequate infrastructure for Park management at key locations including accommodation and drinking water facility;
- Illegal poaching and wildlife trade from Park.
- The movement of poachers and wildlife traffickers using various routes through Park area posses threat to wildlife;
- As most of the Park area is located in remote areas there is no electricity and communication in all the parts of the Park is difficult;
- Patrolling of Core area is not possible during winter and rainy season due to heavy snowfall and rainfall.
- Current number of staffs is insufficient for regular patrolling and monitoring;
- The infrastructure for Park headquarters, Sector offices, Range posts and posts needs to be build and upgraded with adequate facility of drinking water system, electrification and others and
- There is insufficient budget for purchase of field gears and logistics for patrolling and use of advanced technology like survelliance cameras, GPS, laptops etc. for SMART patrolling.

5.3.1.1.3. Strategies

- Infrastructure development for mobility and patrolling.
- Patrolling through foot trail, motorcycle and vehicle to minimize illegal activities using available means;
- Explore and use innovative and advance technology to monitor sensitive areas and to study land use change;
- Establish information collection and purchase mechanisms with local informants;
- Share information and extend cooperation with SNP and QNPR authority to control poaching and illegal wildlife trade and
- Coordinate, collaborate and cooperate with Central Investigation Bureau (CIB) to controlpoaching.

5.3.1.1.2. Activities

In order to ensure park protection, regular patrolling of the park is essential as there is no shortcut to ‘Boots on ground’ for the effective park protection. Thus, the plan suggests strengthening of existing practices related to park patrolling. The following activities have been recommended to enhance the effectiveness of the park protection and the detail quantity and financial requirements are listed in the budgetary section:

- Construction of headquarters in Seduwa, Sector Offices in Hattiya, Tamku, Bung, Seduwa, Mera Peak, Range posts in Cheskam, Park Guard Posts in Pukhuwa Dobhan, Yangsima, Kothe, security check posts in Bung, Chyamtang, Seduwa, Chitre, Deaurali, Kothe, Yaphu Phedi, Cheskam.
- Repair and maintenance of office buildings in HQ, Sector office, Range post, Guard postand security posts including fencing;
- Construction and upgrade facilities such as drinking water, solar power for printing, photocopy, lighting and charging batteries of communication and mobile phones at HQ, Sector offices, Rangeposts, posts and security posts;
- Maintain kitchen, toilet and fence of posts and sector offices regularly;
- Construct and repair wooden bridges at different places in BZ and Park area;
- Install walky-talky radio communication throughout the Park including repair and maintenance;
- Installation, repair and maintenance of additional CCTV cameras in security check postsand Ticket counters;
- Carry out short, medium and long range patrol including sweeping and camping operation;
- Procure field gears and logistics required for high altitude patrols;
- Procure metal detector to identify iron set leg traps probably used by poachers to trap wildlife;
- Piloting of drones to take pictures of sensitive areas;
- Procure 4 CCTV cameras, 12 digital cameras, 20 GPS, 5 laptops, 20 binoculars, 8 portable gas stoves, 16 tents, 80 torch lights, 80 raincoats;
- Initiate real time SMART patrolling in MBNP and
- Procure 5 off-road motocycles.

5.3.1.2. Anti-poaching activities

5.3.1.2.1. Status

Poaching of animals like Musk deer, Himalayan thar, Barking deer, Common leopard, Himalayan Black bear, pheasants and illegal collection of NTFPsare the serious issues inMBNP management.Likewise, likelihood of retaliatory killing of wildlife in MBNP and BZ cannot be ignored. A district level Wildlife Crime Control Bureau (WCCB) has been formed for Sankhuwasabha district coordinated by CCO of MBNP. The Bureau comprises of officers representing District Administrative Office, District Police Office, Armed Police Office, District Level National Investigation Office, District Attorney Office, District Forest Office and other relevant government offices as well.

Similarly, in order to curb poaching of wildlife species and illegal trade of their body parts, MBNP has recently established Community Based Anti-Poaching Unit (CBAPU) under six BZUCs.

However, at present very few wildlife trade cases have been legally registered in MBNP. Thus, there is aneed of develop a network of informants and strengthening their capacity for regularly gathering intelligence as well as keep eye on suspected person and activities to curb the illegal activities. Forthis the role of contiguous Sagarmatha National Park in the west, Kanchanjunga Conservation area in the east, Division Forest Offices, Nepal Army, Nepal Police and other related institution in necessary.

5.3.1.2.2. Issues

- Lack of network of informants for intelligence gathering;
- Inactiveness of CBAPUs in information collection and sharing;
- Insufficient activities conducted by district level WCCB due to lack of funds;
- Lack of trainings for capacity building of Park staffs, NA personnels and CBAPU members;

5.3.1.2.2. Strategies

- Build networks of informants in every sector of the Park;
- Increase activities of district level WCCB and organize transboundary meetings with QNNP of TAR china;
- Capacity building of Park staffs, NA personnels and CBAPU members through different trainings and exposure visits.

5.3.1.2.2. Activities

- Selection, orientation and mobilization of informants for intelligence network formation,
- Institutionalize Community-based Anti-poaching Units (CBAPU) in remaining 6 BZUCs;
- Encourage and mobilize eco-clubs, students and local clubs against poaching and other illegal activities;
- Initiate long-term surveillance of suspected person, area and activity;
- Build capacity of informants to ensure that approach to intelligence gathering is not invasive;
- Strengthen and increase WCCB activities at district level, nearby protected areas (Sagarmatha National Park and Kanchanjunga Conservation Area) and trans-boundary cooperation with TAR.
- Organize trainings for Park staffs, NA personnels and CBAPU members about highly poached and traded wildlifes, identification techniques of wildlife parts and prevailing policies and laws about anti-poaching.
- Provide mobile phones, sim cards and recharge cards for informants.
- Award prizes to most active CBAPU members yearly at National CBAPU Day.

5.3.2. Habitat Management

5.3.2.1. Rangeland Management

5.3.2.1.1. Status

Rangelands comprehend a wide assortment of grasses, shrubs and other plant species on which a number of important wildlife species depend. Rangeland is also grazing area for livestock, which are an integral part of livelihood of local community. Rangeland conditions and forage availability in Makalu-Barun area is relatively better than in many parts of Nepal (Sherpa *et. al* 1990). It is reported that grazing pressure on high altitudes particulary is leading to modification of vegetation cover, one of the noticable change being the increase in unpalatable species thus increasing threat to the threatened and endemic species (Chaudhary and Vetaas 2002). Rangelands at high elevation areas are considered to be exploited in an unregulated way. Sustainable management of rangeland ecosystems has direct implications for conservation of biological diversity and for the livelihoods of local communities in MBNP&BZ.

Rangelands are important for wildlife forage, NTFPs/MAPs, tourism, carbon storage and also have traditional and cultural significance for local communities. Much of the upper elevation landscapes between 3,500 and 5,000 m are dominated by shrubs and grass cover. These landscapes are primarily used for livestock grazing, collecting fodder, wild food materials, medicinal and aromatic plants. Despite rangeland's understood significance,

5.3.2.1.2. Issues

- There is inadequate information on their present management status;
- The settlement of grazing rights in the Himalayan Parks often leads to conflicts and controversies;
- Traditional livestock grazing communities practice uncontrolled and haphazard grazing in rangelands (*Kharkas*) causing degradation of plant species present there;
- Lack of scientific studies about exent and status of rangelands and
- Indiscriminate collecting of timber, fodder, wild food materials, medicinal and aromatic plants like *Cordyceps sinensis, Aconitum spps. etc.* from rangeland areas.

5.3.2.1.3. Strategies

- Promote conservation and sustainable use of rangelands for maintaining the functional environment;
- Collaborate with researchers and academician to carry out scientific studies and research;
- Control Invasive Alien Species (IAS) by priorotizing degraded rangelands and carry out preventive and mitigative measures each year;
- Mobilize BZMC to control and regulate the expansion of grazing areas by forming goth committees and maintain database of traditional livestock grazers in the Park area and
- Collaborate Livestock Service Office (LSO) to encourage stall-feeding, replacing unproductive livestock and vaccination against foot and mouth disease and
- Prepare harvesting plan for different medicinal and aromatic plants.

5.3.2.1.4. Activities

- Undertake inventory and mapping of rangelands recording XY coordinates;
- Undertake inventory and mapping of IAS affected rangelands recording XY coordinates;
- Create alternative grazing lands in appropriate areas of BZ to reduce pressere on core area;
- Undertake species diversity survey (flora and fauna) in identified rangelands;
- Demarcate the grazing and non-grazing areas to regulate the livestock grazing in MBNP;
- Conduct long-term research on rangeland dynamics;
- Prepare sustainable harvesting plan for annual harvest of important rangeland NTFPs (like *Ophiocordyceps sinensis*, *Aconitum spp*, *Rheum spp*, etc) and
- Formgrazing sub-committees in BZUGs, BZUCs and register them under MBNP and develop grazing action plan considering carrying capacity of rangelands.

5.3.2.2. Wetland Management

5.3.2.2.1. Status

High elevation wetlands of MBNP have become globally significant, especially given that these wetlands function as source of fresh water for the Indian sub-continent and are prone to effects by global warming and climate change. They are important habitat for a number of migratory and resident waterfowls. The high altitude flora and fauna of these wetlands are important for global biological diversity as there are very few other places where life exists at such unique high altitudes. In Nepal, paucity of studies and research on high mountain wetlands has made difficult to get a clear idea on their status especially with regards to the threats and their management.

Seven major watershed tributaries form river valleys to the south in MBNP area, they are; Barun, Kasuwa, Isuwa, Apsuwa and Sankhuwa rivers draining into the Arun river, and Hongu and Inkhu rivers draining into Dudh Koshi river. The park area is famous for many stagnant water bodies (lakes/ponds) such as Panch Pokhari, Barun Pokhari, Tama Pokhari, Dudh Pokhari, Jhule Pokhari, Yekle Pokhari, Tin Pokhari, Thulo Pokhari, etc. Most of these water bodies are considered sacred and are reigiously worshipped on various occasions. Major pilgrims (about 200-300 people) from Makalu area and other places visit Thulo Pokhari area during July-August in Janaipurnima festival. Mostly Rai, Bhrahman and chetri worship at Sano Pokhari and Thulo Pokhari, whereas Sherpas worship only at Thulo Pokhari.

On April 20, 2017, Langmale Lake, that liles below Makalu Base Camp (MBC), outbursted due to reasons still unknown and caused several topographical and economic damanges. But it was not the first glacial lake outburst incident in MBNP area. In 2056 BS, Tama pokhari explosion caused GLOF with flood effects till the confluence of Dud Koshi and Inkhu River. High altitude wetlands are naturally vulnerable, due to their location in an ecologically fragile and unstable zone.

5.3.2.2.2. Issuses

- Inadequate information about present wetlands status;
- Lack of scientific studies about current status, vulnerability and threats towetlands
- Glacial Lake Outburst Floods (GLOFs), pollution, overgrazing, unsustainable harvesting of resources are the pronounced threats to wetlands;
- Impact of climate change in high altitude wetlands and;
- Pollution in high altitude wetlands due to religious and tourism activities.

5.3.2.2.3. Activities

- Undertake inventory and mapping of wetlands recording XY coordinates;
- Undertake species diversity survey (flora and fauna) in identified wetlands;
- Classify wetlands on the basis of liability to outbursts, climate change, pollution and human pressure;
- Conduct long-term research on wetland dynamics;
- Conduct studies for assessment for water quality;
- Conduct regular monitoring of Langmale lake and other glacial lakes in order to get regular update about their outburst potentiality;
- Carry out conservation interventions on wetlands of religious and tourism significance and
- Strengthen awareness programs related on wetlands like wetland related conservation education, interaction, stakeholders' meetings etc.

5.3.2.3. Wildlife Health Management

5.3.2.3.1. Status

It is very difficult to treat free ranging wild animals and control epidemic disease outbreaks. It is important to ensure that chances of any infective disease being communicated to the wild animals are minimized. Domestic cattle are potential carrier of diseases to the wild.

As the shifting grazing tradition prevails even today in the park, interaction between wild animal and domestic livestock is obvious, either directly or by sharing the same rangelands or waterholes. Also, wild animals may come in contact with the domestic livestock while straying out of the core area. Since there is the risk of transferring disease from livestock to wild animals and vice versa, health monitoring and surveillance for wild animal diseases should be done regularly. Besides, regular and timely immunization of domestic livestock around the park against the major diseases is needed to prevent disease outbreak.

5.3.2.3.2. Issues

- There is high risk to wildlife getting infected by foot and mouth and several other infectious diseases from livestock grazing in Kharkas inside the Park area and
- The wildlife health management has been given less priority in the planning and budget allocation as it is sought as emergency medical services.

5.3.2.3.3. Strategies

- Develop wildlife health centre and orphanage care facility.
- Formulate a protocol for wildlife health monitoring and disease surveliance;
- Coordinate with District Veterinary Offices, and seek their support whenever required and
- Build capacity of exsisting staff to provide effective medication to wildlife.

5.3.2.3.4. Activities

- Establish wildlife orphanage / rescue centre at least one in HQ for emergency treatment;
- Treat injured animal upon arrival at orphanage and rescue centre;
- Carry out disease surveillance in livestocks in BZ area;
- Undertake research and development works towards management of wildlife health;
- Coordinate with District Livestock Service Office (DLSO) to provide vaccine to livestock against potential diseases that can be transferred to wildlife.
- Support BZUCs to establish a community based veterinary center with epuipments required in medical emergencies.
- Report and document mortality of wild animals immediately after it comes to notice of any staff as part of disease surveliance strategy;
- Coordinate with DLSO to undertake postmortem of deceased endangered wild animals
- Carry out joint mobile health camps for livestocks in BZ with DLSO

5.3.2.4. Fire Management

5.3.2.4.1. Status

Forest fire creates big threat to wildlife of the Park especially to the reptiles, young mammals and birds. More than 95% of the fire cases are caused by peoples' carelessness during the slash burning. NTFP collectors or throwing of burning match stick, bidi or cigarette by the local people while walking along the Park and BZ area. Intentional fire is generally set out by villagers to get flush of new grass shoots for their livestock. Forest fire is a great imposing threat to biodiversity of MBNP. Previous fire records in the park and buffer zone have been documented to some extent, though not all.

For controlling forest fire, the Park management has placed strict prohibition on taking fire-producing items inside the Park but it is difficult to control as many villages are located in BZ area. Local buffer zone user committees are closely working with Park authority to control the forest fire. The presence of NA also has proved a huge help for controlling random forest fires and other disaters in Park and BZ area.

5.3.2.4.2. Issues

- When the forest is on fire, the wildlife panics and cannot flee out quickly for survival;
- Increasing fire sizes and severity may lead to increased loss of critical forest habitats resulting in a long-term impact to the exsisting natural resources and communities;

- There is lack of fire-fighting strategy and and inadequate fire-fighting equipment at field level to combat fire incidents; and
- There is no systematic data collection regarding the occurrence of the fire incidents to analyze the trend for the correction of future course of action.

5.3.2.4.3. Strategies

- Develop and maintain fireline;
- Develop capacity of Park staffs, security personnel, BZUGs members and BZ communities to control fire in the Park and its BZ;
- Increase awareness towards BZ communities about prevention of fire incidents; and
- Establish RRT response team by involving local people, Park staff and security personnel for firefighting in Park HQ, sector offices and oyher fire prone areas.
- Prepare fire-fighting strategic and management plan and implement it;

5.3.2.4.4. Activities

- Provide fire-fighting equipment to Park posts and BZUCs.
- Mapping of fire prone areas and identifying fireline construction sites;
- Organize coordination meeting with related stakeholders for better plan and action related to fire and its hazard;
- Establish fire occurrence reporting databases;
- Conduct training to park staff and local people regarding firefighting techniques; and
- Carry out fire prevention education and awareness activities.

5.3.3 Encroachment

5.3.3.1.Status

Encroachment of the Park land is a severe problem in the Mera Peak region and MBC region of the Park. Both region are situated in Core area of the Park. Illegal construction of tea shops, hotels and small restaurants in Kothe, Khare, Thangnak, Dik kharka, Khonmadingma, Mera and other places in Mera Peak region and Yak Kharka, Yangle Kharka, Khongma, Langmale, Shersong and MBC areas have had huge impact in the surrounding environment leading to deforestation, pollution and disturbance to wild animals and their habitats. These infrastructures were constructed in the Kharkas where seasonal grazing of livestock was done by local people in the past. Th number of such illegal construction are increasing and there is an immediate need of policy and guidelines to regulate these activities.

5.3.3.2.Issues

- Encroachment fragments the habitat and acts as bottleneck in biological corridor.
- Encroachers can be involved in poaching directly or support poachers by providing information about Park patrols and stay with them in their structures;

- The illegal or informal settlers increase encroachment areas for expand their construction; and
- Development of infrastructure in encroached area fragments the habitat.

5.3.3.3.Strategies

- Discourage endroachment of Park and BZ forest by immediate response in evacuation and restore evacuated areas;
- Collaborate with District Administration Office (DAO), NA, BZ communities, Political Parties, Non-Governmental Organizations (NGOs) and concerned stakeholders to evacuate encroachment as per current government policy to control encroachment in more coordinated and effective manner;
- Use information and communication strategy to aware the local people about consequences of encroachment.
- Develop policy and guidelines for registering and building of tea shops, hotels, lodges and small restaurants along the tourist routes.

5.3.3.4.Activities

- Mapping of encroachment areas;
- Issue notice to evacuate the encroached areas;
- Coordinate with Local Government Authorities to resolve the encroachment problems;
- Form committee to address the issues of illegal settlers;
- Evacuate and restore the encroachments in corridors.

5.3.4. Ecotourism promotion and culture conservation

The background, scenario, interpretation facilities, issues and activities related to ecotourism and culture conservation is described in chapter 8 of this management plan.

CHAPTER 6 – RESEARCH, MONITORING AND CAPACITY BUILDING

6.1Research

Research is indispensable for every PA as it helps to cultivate database and supports in decision making for future plan. In order to guarantee effective management, there should be appropriate information on bio-physical, ecological and socio-cultural aspects of PAs. In addition, research allows scientific management of a PA and also serves as a tool to solve problems. Thus, research and monitoring should be oriented towards satisfying the management needs. Though MBNP had once been keen for scientific research before its establishment, few scientific researches have been conducted in this park after that. Most of the final reports of the researches carried out in this park have not been submitted.

As per the arrangement made by the DNPWC, there is well-spoken instruction that the researcher must get an approval from the DNPWC prior to conducting any research in the Park. The researcher is also obliged to report his/her progress of ongoing research to Park management. Though exercises have been done to work out the research needs and priorities for the Park, there is a lack of funding sources and less interest of researchers to conduct the research. Therefore, the research activities are quite limited in the MBNP. The population status of many endangered species is not adequately understood.

Thus there is a need to set research priorities for MBNP and its BZ. The key steps to strengthen research and monitoring in MBNP are as follows:

- Identifiation of gaps and areas for short and long-term research in the Park.
- Formulation of research plan for the Park.
- Collaboration with academic institutions and organizations for periodic researches.

The specific research priorities based on the present context and available information are as follows:

Species Conservation

- Update digital database, maps using latest topo sheets, satellite imageries for updating information on Snow leopard, Musk deer, Red panda, Grey wolf, Himalayan Black bear, Indian Pangolin, Clouded leopard, Asiatic Golden cat and Leopard cat;
- Carry out study to acquire knowledge on Snow leopard population by using newly available genetic techniques such as genetic finger printing, photographic capture-recapture survey;
- Undertake studies to determine Snow leopard and Himalayan Black bear population, composition and abundance.

- Create baseline information on rare, endangered, endemic and protected flora and fauna with the help of national and regional experts;
- Undertake an assessment of Musk deer population viability in MBNP;
- Undertake intensive research on trans-boundary movement of Snow leopard and use of corridors, BZ areas and human settlement through satellite radio telemetry;
- Conduct studies on the scale, extent, and local variations in the intensity of HWC to help in identifying and designing effective mitigation measures;
- Study of distribution and abundance of various prey base species;
- Undertake detailed studies on ungulate-habitat relationships and the feeding behavior of ungulates;
- Carry out study on spatial distribution and abundance of Red panda;
- Carry out study on spatial distribution and abundance of felids in MBNP;
- Identify indicator species to assess habitat condition;
- Study ecological processes that affect maintaining healthy wildlife population;
- Undertake study of Grey wolf about its distribution, population dynamics, preferred grass and its behavior;
- Identify critical pangolin habitat and map the priority sites;
- Underatake species diversity survey (flora and fauna) in identified rangelands;
- Conduct long-term research on rangeland and wetland dynamics;
- Prepare sustainable harvesting plan for annual harvest of important high value NTFPs (like *Ophiocordyceps sinensis*, *Aconitum spp*, *Rheum spp*, etc)
- Undertake inventory and mapping offire prone areas and identify fire line construction sites;
- Study and preparation of checklist of rare, endangered, protected, migratory and resident birds;
- Status survey on invasive species and their impact on forests and agriculture;

Habitat Mangement

- Prepare action plan for the Strict Nature Reserve Zone management and conservation.
- Preparelanduse management plans for critical habitats of Snow leopard outside PA;
- Mapping of critical wildlife habitats and areas of high conservation significance with focus to SHL;
- Study distribution and abundance of palatable grass species, recording XY coordinate, favoured by various ungulates;
- Undertake study to identify the succession pattern of rangelands, forests and wetlands;
- Study the effect of invasive alien species to wildlife habitat;
- Collaborate with researchers and academician to find the appropriate measures for controlling invasive alien species;
- Conduct study on the effect of habitat fragmentation and degradation on wildlife survival;

- Carry out wetlands and rangelands mapping and assess their successional dynamics to inform management prescriptions; and
- Prepare intregated rangeland and wetland management plan;

Fire Mangement

- Undertake study of spatial and temporal pattern of fire incidence; and
- Identify fire prone areas by using satellite imagery analysis or web-based fire mapper.

Encroachment

- Survey, map and demarcate the encroached area together with structures and maintain the record.

Tourism management

- Conduct survey to identify the perception of visitors about the tourism facilities and services from hotels and Park authorities;
- Study to identify potential tourism products and their packaging;
- Conduct study to identify potential site to promote homestay; and
- Undertake marketing strategy to attract visitors in the Park and BZ.

Climate Change

- Conduct study of climate change indicators and impact on biodiversity conservation along with identification of adaptation activities;
- Undertake vulnerability assessment with respect to climate change; and
- Prepare community-based adaptation plans for most vulnerable sections/areas.

Buffer Zone

- Undertake assessment of socio-economic condition of local people in the areas where human-wildlife conflict is high;
- Carry out relationship between anthropogenic activities and maintenance of healthy and viable wildlife populations; and
- Research and study for documentation of indigenous agricultural practices such as community cooperation system for their promotion (modernization) in natural resource management;

Institutional Strenghening

- Review and upgrade reporting and information sharing system;
- Undertake evaluation of five year management plan;
- Prepare next five year management plan including IEE;

- Undertake study of management effectiveness of the Park; and
- Produce a compilation report containing details about all research studies carried out in MBNP before its establishment to now.

6.2 Monitoring

Monitoring wildlife,their habitat, vegetation and landscape on regular basis is imperative for the management of a protected area. The result from regular and periodic monitoring gives the idea on the trend of wildlife population, change in habitat condition, vegetation and landscape over time. As monitoring provides information on ecological changes based on vital sign, it is beneficial for PA managers especially in early warning and early control. Thus, monitoring is a tool for rationalization of management decisions for protected area. Monitoring of the Park resources is done on regular basis by the guard posts in their respective areas. Long, medium and short-range patrols are jointly carried out by Park staffs and NA inside Park area to curb poaching activities. CCO and corresponding NA company commander visit Park security check posts and posts separately or jointly for periodic monitoring. A monthly, quarterly and annual progress reports are sent to DNPWC and Ministry of Forest and Environment (MoFE).

The following key areas and framework for monitoring of wildlife conservation are proposed :

Species Monitoring

- Conduct the monitoring of Snow leopard on periodic basis by using latest technologies,
- Monitor Musk deer, Black bear, Grey wolf, Clouded leopard and other mammals annually using camera trap methods.
- Monitor Black bear, Barking deer, Assamese monkey and other wildlife arounf BZ with local community engagement;
- Monitoring of indicator species;
- Monitoring of prey base species on regular interval;
- Monitoring of small mammals;
- Monitoring of winter migratory birds;
- Monitoring of annual harvest of important rangeland NTFPs (*like Ophiocordyceps sinensis, Aconitum spp, Rheum spp,* etc);
- Monitoring of globally threatened and nationally protected birds; and
- Identification and long-term monitoring of climate change sensitive species;

Habitat Monitoring

- Undertake habitat monitoring, prepare checklist of food plants, document physical and phenological changes in vegetation, quantity and quality of discharges in streams and biotic disturbances;
- Periodic monitoring of habitats alongside the trekking routes; and

- Periodic monitoring of rangelands and wetlands;

Fire Monitoring

- Monitor spatial and temporal pattern of fire incidence;
- Monitor fire and fuel dynamics.

Tourism Impact Monitoring

- Monitor tourism impact on social, economic and cultural aspect of BZ area;
- Monitor tourism impact on quality of habitat and environment alongside the trekking routes;
- Monitor the contribution of tourism to the poor, women and marginalized community; and
- Tourism impact monitoring in especially in Mera Region and Makalu region.

Weather Monitoring

- Periodic monitoring of temperature using DHM data for every five years;
- Periodic monitoring of precipitation using DHM data for every five years

Water Quality Monitoring

- Monitor water quality of wetlands, rivers and streams on aregular basis.

6.3 Capacity Building

Protected area management involves complex issues to be addressed for the sustainability of the biodiversity conservation endeavors. For this, park staff should have a range of skills on technical as well as managerial aspects of the PA management. However, there are very limited academic and experienced staffs in MBNP especially in field techniques. Many skills are to be learned and shared through various trainings. Needs based training helps to increase the efficiency of park staff. The need for training varies according to the position and role of the staff. Thus, training needs assessment should be conducted before planning for training programme. There is a need of both horizontal and vertical participant trainings. The horizontal type of training involves the participants of equal rank whereas vertical type of training involves participants of different ranks from chief warden to game scouts and from company commander to soldiers. Vertical type of training is important to understand field staff of different levels and share experiences and build mutual trust and relations. Some of the capacity building activities that are considered important to MBNP staff are as follows:

Park Protection

- Orientation trainings to security troops for newly appointed Company before deployment in the field;
- Orientation trainings to Game Scouts on legal issues;
- Refreshment trainings to the field staffs and security personnels;
- Basic trainings to Game Scouts and Rangers to handle GPS equipment, camera etc.;
- Conduct training on real-time SMART patrolling to Park staffs and security troops;
- Conduct anti-poaching operation trainings to Park staffs, security personnel and CBAPU members;
- Conduct crime scene investigation and interrogation trainnings to investigators as per legal provision;
- Conduct human rights trainings to handle the convicted persons; and
- Organize judicial trainings to Park officers.

Species Conservation

- Wildlife management and handling trainings with focus to Black bear, birds, wild boars, deers, and monkeys;
- Conduct trainings on wildlife habitat and population monitoring techniques;
- Trainings about field techniques, including signs, sounds and other indirect evidences of different wildlife species;
- Train staffs to collect sample of blood, scats, pellets, urine or vital organs; and
- CITIES training.

Habitat Management

- Basic training on vegetation quantification for recording data in monitoring plots;
- Provide trainings to the Park staff about wildlife habitat monitoring.

Fire management

- Conduct forest fire management trainings for Park staffs, security personnel and BZUGs members.

Wildlife Health Management

- Build capacity of frontline staffs to collect sample of blood, scats, pellets, urine and vital organs;
- Build capacity of frontline staffs to identify, record and report disease or poor health condition of wildlife.

Tourism Management

- Provide trainings to nature guides to enhance their capacity in nature interpretation specifically on wildlife, birds and plants etc.;
- Trainings on nature interpretation and display management.

Buffer Zone

- Social mobilization trainings;
- Appreciative enquiry trainings;
- Conflict management trainings;
- Organization development and management trainings;
- Leadership development trainings;
- Account keeping trainings.

Institutional Strengthening

- General and specialized Training of Trainers (ToT);
- Public administration and management training;
- Planning, monitoring and evaluation training;
- Database management Training to Rangers and Officers;
- Geographical Information System (GIS) training to Rangers and Officers.

CHAPTER 7 – SPECIES CONSERVATION PROGRAM

7.1 Snow Leopard(*Uncia Uncia*)

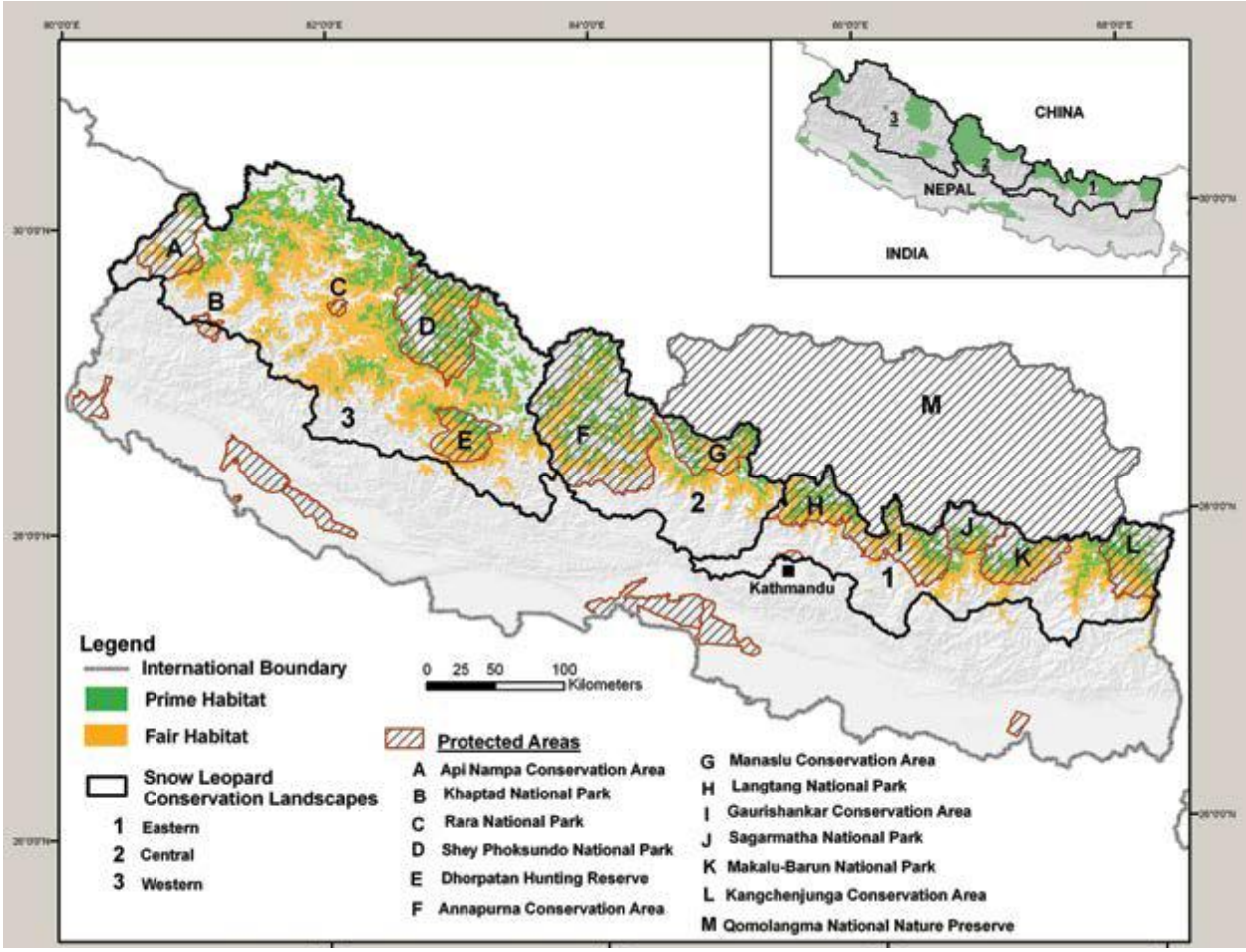
Status

The snow leopard (*Panthera uncia*) is an elusive native cat of the high mountains of Central and South Asia. The species inhabits an estimated area of 1.8 million km^2 at altitudes ranging from 540 m to more than 5,000 m (GSLEP, 2013). They are found in 12 countries and their current estimated global populations range from 3,921 to 6,290 (DNPWC, 2017).

Snow leopard (*Panthera uncia*) is an indicator species of a healthy mountain ecosystem, and is widely but patchily distributed along the Himalayas in Nepal (DNPWC, 2013). The species is included in the protected mammals list under the National Parks and Wildlife Conservation Act, 2029 (1973) in Nepal. Nepal Biodiversity Strategy and Action Plan (NBSAP) 2014-2020 emphasizes priority actions in conserving endangered species including the snow leopard. (DNPWC, 2017).The snow leopard is listed as 'endangered' in the IUCN Red Data Book, and as an Appendix I species in CITES, prohibiting international trade of the species (DNPWC 2017).

In Nepal, the potentialsnow leopard habitat is estimated at almost 13,000km^2. The estimated snow leopard population in Nepalranges around 301-400. The estimate isbased on linear relationship with sign encounterrates, which has been verified with predator-preyrelationship.The Government of Nepal is committed to establish three snow leopard viable landscapes by 2020 i.e. 1) Eastern, 2) Central, and 3) Western. The eastern landscape coincides with Sacred Himalayan Landscape (SHL) and includes Langtang, Gaurishankar, Sagarmatha, Makalu-Barun and Kangchenjunga Himals. A combined potential habitat of 1073 sq km is designated in MBNP and SNP out of 2900 sq km in this landscape. The action plan reports the transboundary movement of a radio collared snow leopard of KCA in Kimathanka of MBNP on its way to Tibet (DNPWC, 2017).

MBNP has significant habitat for snow leopard but the current status of this predator is unknown due to lack of scientific studies conducted inside the Park area. It has been informal reports from shepherds that snow leopard was sighted in various areas sporadically and their cattle and sheep were predated occasi-onally. In spite of these information no formal application has been dropped at MBNP office for compensation.



Map 13 Snow leopard range in Nepal Himalayas with three landscapes

Map Source: DNPWC/WWF Nepal

Significance

Snow leopard (*Panthera uncia)* is an the apex predator of the Himalayan ecosystem, playing an important role in maintaining the biodiversity of the ecosysytem.The highest peak of the world Mt. Everest (8848m) is located in Nepal along with other seven peaks having elevation more than 8000m including Mt. Kanchenjunga, Mt. Makalu, Mt. Lhotse, Mt. Manaslu, Mt. Cho Oyu, Mt. Annapurna, Mt. Dhaulagiri more than 8000m. The foothills of these mountains are the main habitats of snow leopard and a unique assemblage of rare and endangered species including Tibetan argali (*Ovis ammon hodgsonii*), Tibetan gazelle (*Procapra picticaudata*), wild ass (*Equus kiang*), and blue sheep (*Pseudois nayaur*), lynx (*Lynx lynx isabellinus*), grey wolf (*Canis lupus*), Himalayan black bear (*Selenarctos thibetanus*).

Snow leopard in Nepal is popularly known as Queen of Mountain. The habitats of snow leopard have alsoenormous effects to generate income and employment opportunities to local

communities. Besides,Himalayan region of Nepal which extended from Mt. Kanchenjunga in the east to Mt. Api-Nampa in thewest, is the source of perennial water flowing from north to south and consequently source forhydroelectricity, irrigation and drinking water and eventually overall development of the country. The Himalayan region has a huge contribution to national economy through producing water resources,tourism, NTFPs and aromatic and medicinal plants (MAPs). The snow leopard habitats are also regarded as the thirdpole of the earth and matter of concern to environmentalists and conservationist worldwide (NSLEP, 2014).

Over exploitation of medicinal plants and over grazing by growing number of livestock herds along with shifting traditional herding practices are major causes of wildlife habitat loss and degradation in rangelands in alpine zone (Miller, 1998). Climate change has also emerged as a most pervasive threat to the survival of snow leopards as approximately 30% of snow leopard habitat could be lost from the shifting of tree line chiefly along the southern edge of the Himalayas and in river valleys of the alpine zone (Forrest et al., 2012).

Thus, conservation of Snow leopard is not just about a single species but about whole ecosystem, landscape and planet.

Conservation Efforts:

Policy and Legislation:

- The NPWC Act provisions 'a fine ranging from NPR 500,000 to NPR 1,000,000, or an imprisonment ranging from five years to 15, or both, for offenders and accomplices convicted for illegal trade in Snow leopard body parts.
- The act also has provision to reward the informants with an amount up to NPR 50,000 for aiding in seizure of its body parts or arrest of Snow leopard criminals.
- Preparation of Snow Leopard Conservation Action Plan for Nepal (2017-2021);
- The Forest Policy, 2071 B.S. and NBSAP, 2014-2020 A.D. stress the need for biodiversity conservation, particularly focusing on the protection of threatened and protected species of Nepal including Snow Leopard;
- Accordingly, in 2018, the government amended the Wildlife Damage Relief Guideline, 2069 B.S.(Second amendment 2074 B.S.) to increase the relief amount in case of human death to NRs 10,00,000; likewise, relief limit for ordinary to serious injuries was increased to NRs 20,000 to NRs 20,00,000 and compensation for livestock depredation to NRs 10,000 to NRs 30,000.

Institutional Development:

- Establishment of NTCC, the NWCCCC, the WCCB at the central level and WCCB in district levels.
- Formation of Community-Based Anti-Poaching Units (CBAPUs) and Snow Leopard Conservation Committees (SLCC).
- To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011.

Landscape Approach:

- Preparation and implementation of Kailash Sacred Landscape (KSL) Conservation & Development Initiative (KSLCDI): Implementation Plan (2012-2016) and Sacred Himalayan Landscape (SHL) Strategic Plan (2006-2016) and the SHL Interim Implementation Plan (2010-2014), Chitwan-Annapurna Landscape (CHAL) Strategic Plan.

Cutting-Edge Research to Inform Conservation:

- Satellite telemetry on individual snow leopards.
- Annual population monitoring through standard camera trap methodology in KCA
- Non invasive genetic analysis through scats of snowleopard populations across the Nepalese Himalayas.

Community Engagement in Conservation:

- Formation of SLCCs in mountain PAs including ACA and KCA, LNP, MCA and SPNP
- Involvement of SLCC and Citizen Scientists in Wildlife andHabitat Monitoring.
- Initiation of Community-Based Livestock Insurance Scheme (LIS) in KCA and ACA.

Building Awareness and Capacity:

- 'Snow Leopard Atlas, Nepal' was published in 2013;
- Nepali publication titled 'Hiun Chituwa ko Samrakshan (Conservation of Snow Leopard)'
- October 23rd is celebrated as the 'International Snow Leopard Day'.

Transboundary, Regional and International Cooperation:

- In 2010, Nepal and China signed an MoU for mutual cooperation in conserving biodiversity of the region.
- Regional cooperation in controlling wildlife trade is being facilitated through the South Asia Wildlife Enforcement Network (SAWEN);
- Nepal is also a member of the GSLEP Program, an initiative of 12 snow leopard range countries for collaborative conservation and to promote snow leopard conservation globally.

Issues

- Illegal hunting and retaliatory killing for crop raiding continues to decrease population of prey species of the snow leopard.
- Rising livestock population and overgrazing by them, haphazard infrastructure development and unsustainable harvesting of medicinal plants are causing habitat loss and degradation.
- Mass collection of Yarsa gumba (Ophiocordyceps sinensis), a species endemic to the Himalayas and Tibetan Plateau has also adversely impacted snow leopard habitat.

- These critical habitats have been affected by the intrusions of woody species in sub-alpine and alpine grasslands posing a threat to the diversity of rangelands,
- Poaching and illegal trade of snow leopard.
- Porous international borders, limited intelligence network, inadequate staff, under equipped antipoachingoperations and CBAPUs.
- Opening of new trade routes to Tibet Autonomous Region (TAR), China Kimathanka has been identified as illegal market places.
- Lack of field-level transboundary meetings and information sharing.
- Likely impact of climate change on snow leopards and their habitat.
- Inadequate knowledge on Snow Leopard ecology, demographic patterns and population dynamics;
- Inadequate human resources, technical skills and physical capacity to gather necessary information on Snow Leopard and prey base species;
- Inadequate information on prey population dynamics;
- Impact of tourism (in some utility zone) to snow leopard and its habitat.

Activities

- Continue extensive monitoring of snow leopard and the prey species in MBNP;
- Identify priority habitat, critical corridors and climate-refugia for snow leopards in the face of climate change;
- Conduct study on impacts of changing traditional pastoralism system on wildlife habitats and rangeland productivity;
- Pilot drone technology to monitor snow leopard's prey and status of their habitat;
- Carry out conservation education and outreach programs extensively for community awareness;
- Initiate mapping of climate variability and vulnerability of snow leopard habitats for their proper management by addressing the potential impacts of climate change
- Continue active monitoring and scientific management of rangelands;
- Study on impact of NTFP collection (including Ophiocordyceps) in key snow leopard hotspots;
- Develop both formal and informal extension materials regarding snow leopard conservation;
- Establish security posts in strategic locations throughout MBNP and its BZ;
- Organize regular meetings and sharing of meeting minutes for implementation of decisions, trainings and workshops at transboundary, regional and stakeholder levels;
- Develop snow-leopard based eco-tourism to increase the value of snow leopards among local communities;
- Train and mobilize the Park Staff and the local youths in order to monitor and control likely killings of snow leopards and illegal trade of its body parts;

- Celebrate International Snow Leopard Day on 23rd October every year and take opportunity to promote Snow Leopard conservation awareness during other ceremonies such as (Wildlife Week, Environment Day, Wetland Day, Biodiversity Day, and CBAPU Day).
- Collaborate academic/conservation institutions to enhance knowledge and information on Snow Leopard and its prey base on the basis of scientific works using tested methods;
- Equip CBAPU members, Park staffs and security personnels with adequate field gear and logistics.
- Promote indigenous herding practices and sustainable grazing system to avoid competition between snow leopards' prey and livestock
- Conduct meetings and interaction programs for youths and school students within the BZ of the Park

7.2 Himalayan Musk Deer (*Moschus chrysogaster*)

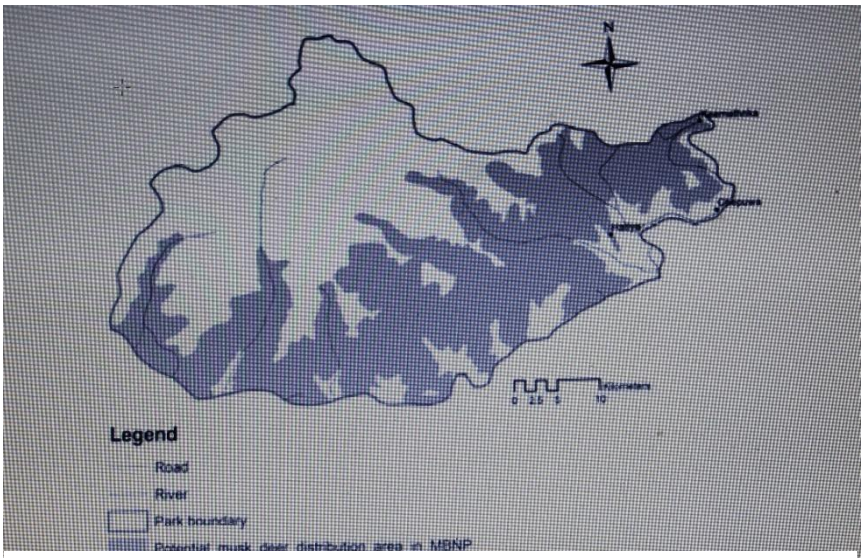
Status

The Himalayan Musk Deer (*Moschus chrysogaster*) is distributed from the eastern to the western Himalayas of Nepal. The Himalayan musk deer is not only the most primitive, but also the smallest ungulate living above the altitude of 2500m. The Government of Nepal protected musk deer as an endangered species, under the National Parks and Wildlife Conservation Act, 1973 and CITES listed it in appendix I and the IUCN Red List of threatened species listed it as endangered (IUCN 2010).The global population of musk deer is estimated between 400000 and 800000 individuals (Wemmer 1998).The population is thought to be increasing within protected areas but declining outside them in Nepal. Sagarmatha National Park has an estimated 600-800 animals, with up to 45 per sq. km. Elsewhere, there are an estimated 500 animals in Langtang National Park, 20 in Rara National Park and >1000 in Shey-Phoksundo National Park (B. Kattel, pers. comm., 1990 by Green).The habitat of Musk deer in upper Langtang Valley, the vicinity of Thyangboche monastery in Khumbu and in upper Budi Gandaki Valley is better protected than other parts of country. According to Jamwal (1972) areas where Musk deer are more commonly found in Nepal are Bajhang, Doti, Simikot, Markhor Lake, Dhorpatan, and Langtang in west and central region. In eastern Nepal, Musk deer are known to occur in Jatapokhari, Taplejung, Chipuwa, Arun and Wallangchung Gola. It is present also in Dhorpatan Hunting Reserve, Khaptad National Park and Makalu-Barun National Park (IUCN, 1993).

However, of the 30177.19 km^2 potential habitat, only 19.3% (5815.08 km2) is inside the PAs while the remaining 80.7% falls outside the PAs. Consequently, poaching, habitat destruction,

livestock grazing and forest fire in the musk deer habitats are important challenges for the conservation of musk deer in Nepal (Aryal and Subedi, 2011).

MBNP has substantial habitat for musk deer. Musk deer species are occasionally seen during park patrol. But scientific study and regular updates on its status is lacking in MBNP. So far this magnificient creature has been sighted in Saldima Valley, Kenpa Kharka, Kothe, Sankhuwa Sheer, Bakang, upper region of Hattiya, Hong Gong and Tamku.According to Aryal & Subedi 2011, Musk deer in MBNP were distributed in Kimanthanka, Chepuwa, Hatiya, Pathivara, Makalu, Yaphu, Tamku, Bala, Sishuwakhola, Bung and Chheskam of Makalu Barun NP. They elaborate thatPopti Bhanjyang catchment area of the Kasuwa, Ipsuwa and Apsuwa river side were the most appropriate potential sites for musk deer habitation and the potential musk deer distribution area was 788.99 km^2highlighting that poaching, forest fires and the grazing problem were the main threats for musk deer in these areas.



Map 14: Potential Habitat for Musk Deer in MBNP

Significance

Himalayan Musk Deer is one of the solitary and crepuscular mammals that inhabit to higher altitude ranging in between 2500m and 4500m (Kattle B, 1992 and Green MJB 1986). The Himalayan musk deer is distributed across the Himalayasfrom Nuristan in Afghanistan in the west to Nepal, Sikkim and extreme north-west Myanmar in the east (Green MJB, 1986, and Corbet GB et al., 1992) and northwards into extreme southwestern China (Qureshi BD et al. 2013). They mostly prefer to oak forest, rhododendron forest, blue pine forest, juniper forest and grassland habitat and distribution in Nepal Himalaya is widely (Kattel B, et al., 1991).

The population trend of Musk Deer is in decreasingdue to anthropogenic pressure and poaching. The highdependency of local people on natural forest also leads todecline the species (Syed Z et al.,2016). Additionally, the species is highlyhunted for its musk pod which has high value and used inperfume industries, as well as in traditional ChineseMedicine (Zhixiao L, 2002). Musk remains one of the most expensivenatural products, much more valuable even than gold(Shrestha TK, 1997). In Asia, traders are the major providers and also themain consumers of musk

products, primarily formedicinal purposes that pushed this deer to the verge ofextinction (Karki MB, 2008).

Habitat destruction and predators pose threats to musk deer populations. However, intensive poaching to meet illegal demand for the scent gland or 'pod' of the male musk deer, is believed to be responsible for dramatic declines in the population of musk deer (Aryal, A. et al., 2010, Y. Wang et al., 2010 and CITES 2002). The indiscriminate methods employed to kill male musk deer, such as snares, mean that at least three to five animals may have to be killed in order to secure one male with a large enough musk gland (M.J.B. Green, 1987).

Conservation Efforts

- The species is included in the protected mammals list under the National Parks and Wildlife Conservation Act, 2029 (1973).
- The act also has provision to reward the informants with an amount up to NPR 50,000 for aiding in seizure of its body parts or arrest of Musk deer criminals.
- The Forest Policy, 2071 B.S. and NBSAP, 2014-2020 A.D. stress the need for biodiversity conservation, particularly focusing on the protection of threatened and protected species of Nepal including Musk Deer.
- Establishment of NTCC, the NWCCCC, the WCCB at the central level and WCCB in district levels.
- Formation of Community-Based Anti-Poaching Units (CBAPUs).
- Preparation and implementation of Kailash Sacred Landscape (KSL) Conservation & Development Initiative (KSLCDI): Implementation Plan (2012-2016) and Sacred Himalayan Landscape (SHL) Strategic Plan (2006-2016) and the SHL Interim Implementation Plan (2010-2014), Chitwan-Annapurna Landscape (CHAL) Strategic Plan.
- To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011.
- Regular periodic patrolling and habitat monitoring;
- Awareness activities to various groups including school students and teachers, shepherds, BZCF users, etc.;
- Conservation messages sharing through local media (FM and newspapers)
- Conservation materials printing and distribution.

Issues

- Illegal trade and poaching of the Musk deer by setting out traps for its musk-pod;
- Rising livestock population and overgrazing by them and unsustainable harvesting of medicinal plants are causing habitat loss and degradation.
- Mass collection of Yarsa gumba (Ophiocordyceps sinensis), a species endemic to the Himalayas and Tibetan Plateau has also adversely impacted Musk deer habitat.

- These critical habitats have been affected by the intrusions of woody species in sub-alpine and alpine grasslands posing a threat to the diversity of rangelands,
- Porous international borders, limited intelligence network, inadequate staff, under equipped antipoachingoperations and CBAPUs.
- Opening of new trade route to Tibet Autonomous Region (TAR), China from Kimathanka has been identified as illegal market places.
- Lack of field-level transboundary meetings and information sharing.
- Likely impact of climate change on Musk deer and their habitat.
- Inadequate human resources, technical skills and physical capacity to gather necessary information on Musk deer;
- Impact of tourism (in some utility zone) toMusk deer and its habitat.
- Inadequate information on status, distribution and ecology of musk deer;
- Inadequate capacity of park staff and local communities in musk deer conservation and monitoring;
- Risk of poaching in the in accessible areas;

Activities

- Identify key habitat for Musk deer and ensure protection of musk deer and its habitat;
- Prepare action plan for Musk deer conservation;
- Keep key habitat of Musk deer inviolate from all sorts of anthropogenic pressure;
- Manage key areas for regular supply of forage for Musk deer;
- Continue extensive monitoring of Musk deer in MBNP;
- Identify priority habitat, critical corridors and climate-refugia for Musk deer in the face of climate change;
- Conduct study on impacts of changing traditional pastoralism system on wildlife habitats and rangeland productivity;
- Carry out conservation education and outreach programs extensively for community awareness;
- Initiate mapping of climate variability and vulnerability of Musk deer habitats for their proper management by addressing the potential impacts of climate change
- Continue active monitoring and scientific management of rangelands;
- Study on impact of NTFP collection (including Ophiocordyceps) in key Musk deer hotspots;
- Develop both formal and informal extension materials regarding Musk deer conservation;
- Establish security posts in strategic locations throughout MBNP and its BZ;
- Organize regular meetings and sharing of meeting minutes for implementation of decisions, trainings and workshops at transboundary, regional and stakeholder levels;
- Train and mobilize the Park Staff and the local youths in order to monitor and control likely killings of Musk deer and its illegal trade;

- Collaborate academic/conservation institutions to enhance knowledge and information on Musk deer on the basis of scientific works using tested methods;
- Equip CBAPU members, Park staffs and security personnels with adequate field gear and logistics.
- Promote indigenous herding practices and sustainable grazing system to avoid competition between Musk deer and livestock
- Conduct meetings and interaction programs for youths and school students within the BZ of the Park.

7.3 Red Panda Conservation

Status

Red Panda considered to be one of the earth's living fossils, its ancestry can be traced back in Europe during the late Oligocence – early Miocene (Peigne et al. 2005). Its ancestors were widely distributed in Eurasia and North America; but now, its distribution is confined in the eastern Himalayas in temperate bamboo forests in south-western China, Nepal, India, Bhutan and Myanmar (Map 1) (Glatston 1989). The species is now limited to temperate, conifer and adjacent broadleaf forest (Choudhary 2001) where it specializes on a diet of bamboo (Reid et al. 1991, Wei et al. 1999). Red Panda (*Ailurus fulgens*) is native to Bhutan, China, India, Myanmar and Nepal (Glaston et al. 2015).

The Government of Nepal has listed Red Panda under schedule I of NPWC Act 1973. The Red Panda is listed as Endangered in IUCN Red List of Threatened Species and included in the Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

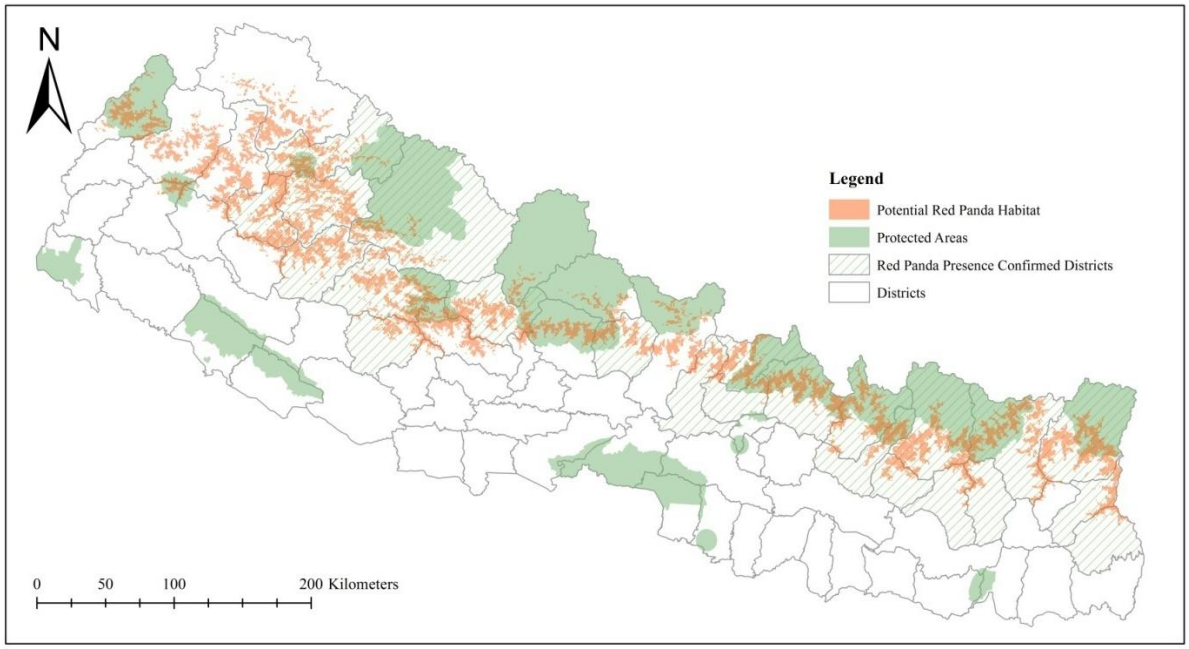
The National Red Panda survey 2016 documented the potential Red Panda habitat available across 23,977 km2, out of which, almost 70% of the total habitat lies outside the Protected Areas (PAs) network (Map 2) (MoFSC 2016). This estimation is close to the finding of other studies: 22400 km2 (Kandel et al. 2015) and 20150 km2 (Thapa et al. 2018). The Red Panda has sparse distribution in temperate and sub-alpine forest zones of the Himalayan ecosystem between 2000 and 4800 meters in Nepal (Baral & Shah 2008). Its distribution primarily depends on the availability of the bamboo forests.

Red Panda has been reported from Rara National Park (RNP), Shey Phoksundo National Park (SPNP), Langtang National Park (LNP), Sagarmatha National Park (SNP) and Makalu Barun National Park (MBNP), Dhorpatan Hunting Reserve (DHR), Annapurna Conservation Area

(ACA), Manaslu Conservation Area (MCA), Gaurishankar Conservation Area (GCA) and Kanchenjunga Conservation Area (KCA).

The national population size of Red Panda has been estimated to be 317-582 individuals (Jnawali et al. 2011). However, Population and Habitat Viability Assessment on Red Panda (Jnawali et al. 2012) suggested total population ranging from 237 to 1061 individuals segregated into 11 sub-populations (1. Kanchenjunga 2. Sankhuwasabha East 3. Sankhuwasabha West 4. Sagarmatha 5. Gaurishankar 6. Langtang 7. Manaslu-Annapurna 8. Dhorpatan 9. Rara 10. Khaptad and 11. Darchula) distributed in Nepal.The central zoo of Nepal has only two individuals of Red Panda to date.

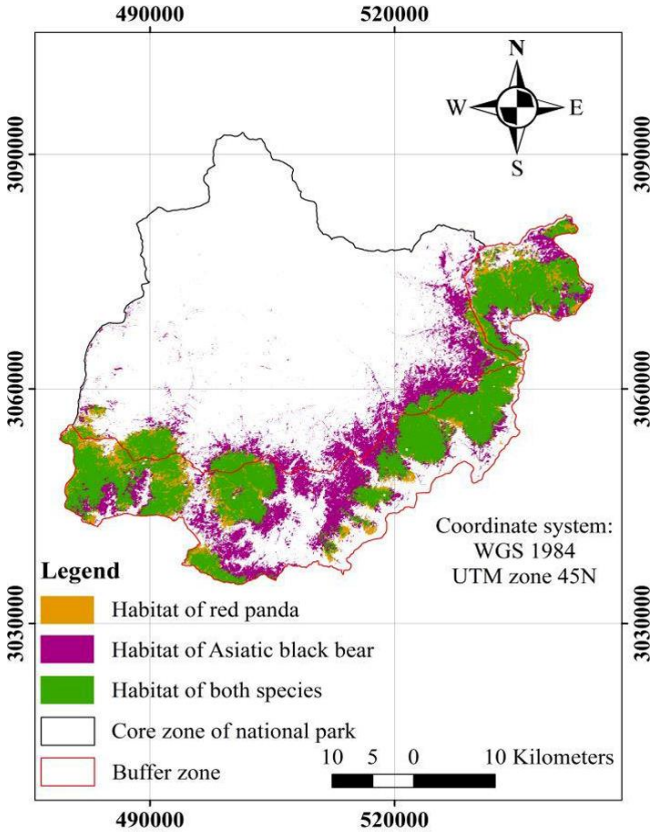
Map 16 : Potential Red Panda habitat and presence confirmed districts in Nepal



Source: MoFSC 2016

Red panda is found in throughout park and buffer zone in the altitudinal rangefrom 2000-4800 m. Baseline information regarding distribution of red panda have identified areas of Bung, Cheskam, Makalu and Tamku VDCs of MBNP as suitable habitats. There is 443 km^2 of suitable habitat for red panda throughout the MBNP area (Map 2). The buffer zone contains 380 km^2 of the suitable habitat of the red panda. Remaining potential habitat is covered by the core zone of the Park (Bista et al., 2016).

Details of GPS locations of Red panda sighting and dropping collection are presented in Annex-15.



Map 17 : Potential Habitat of Red Panda in MBNP area
Source : Bista et al., 2016

Significance

Red Panda, a small crepuscular and arboreal mammal, lives in temperate forests with abundant bamboo in the understory. Red Panda spend most of their time alone, except during the mating season and when the mother is with her cubs. Most of the time, they spend on foraging and sleeping on tree branches or in tree hollows during the day (Yonzon & Hunter 1991, Wei & Zhang 2011). Their altitudinal distribution ranges from 2000-4800 m (Roberts & Gittleman 1984, Yonzon et al. 1991).

Although it is protected by national and international laws, the population is declining due to habitat fragmentation and anthropogenic pressure (Glatston A et al. 2015). The anthropogenic impact on its habitat has been identified as the major threat to the conservation of the species (Panthi S,et al. 2017, Dendup P et al., 2017, Sharma HP et al. 2014, Dorji S et al., 2012). For example, hunting, habitat fragmentation, and conversion of natural forests into plantations are the major threats in China and India (Wei F et al., 1999, Mallick JK, 2010). Additionally, cattle, herders and their guard dogs use the same habitat as the red panda in Nepal, which disturbs their natural habitat and has been directly attributed to red panda deaths.

The population trend of Musk Deer is in decreasing due to anthropogenic pressure and poaching. The high dependency of local people on natural forest also leads to decline the species (Syed Z et al.,2016). Additionally, the species is highly hunted for its musk pod which has high value and used in perfume industries, as well as in traditional Chinese Medicine (Zhixiao L, 2002). Musk remains one of the most expensive natural products, much more valuable even than gold (Shrestha TK, 1997). In Asia, traders are the major providers and also the main consumers of musk products, primarily for medicinal purposes that pushed this deer to the verge of extinction (Karki MB, 2008).

Conservation Efforts

- The Red Panda is listed as 'endangered' in the IUCN Red Data Book and as an Appendix I species in CITES, prohibiting international trade of the live species or its body parts.
- The species is included in the protected priority mammals list under the National Parks and Wildlife Conservation (NPWC) Act, 1973 in Nepal.
- The NBSAP 2014-2020 emphasizes priority actions in conserving endangered species including the Red Panda. Nepal has strong legal provisions to control wildlife crimes particularly for protected priority mammals.
- The NPWC Act provisions 'a fine ranging from NPR 500,000 to NPR 1,000,000, or an imprisonment ranging from five years to 15, or both, for offenders and accomplices convicted for illegal trade in Red Panda body parts.
- The act also has provision to reward the informants with an amount up to NPR 25,000 for aiding in seizure of its body parts or arrest of Red Panda criminals.
- The National Wildlife Crime Control Coordination Committee (NWCCCC) and Wildlife Crime Control Bureau (WCCB) and its respective district units tackle illegal wildlife trade and poaching of endangered species including Red Panda.
- To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011.
- Regular periodic patrolling and habitat monitoring;
- Awareness activities to various groups including school students and teachers, shepherds, BZCF users, etc;
- Conservation messages sharing through local media (FM and newspapers)
- Conservation materials printing and distribution.

Issues

- Forest fires, the traditional transhumance system of livestock herding, firewood collection, bamboo and non-timber forest products (NTFP) collection inside the Park area;
- Mass flowering and die off of bamboo in Tamku, Makalu and Hattiya area;
- Poaching and killings by herders' guard dogs.
- The construction of hotels, roads, and hydropower plants inside Park and BZ areas.

- Despite some awareness activities carried out in BZ areas, there is yet a very limited awareness level amongst different stakeholders;
- Effect of climate induced changes in habitats inside the Park and BZ areas;
- Opening of new trade route to Tibet Autonomous Region (TAR), China from Kimathanka has been identified as illegal market places;
- Lack of field-level transboundary meetings and information sharing;
- Inadequate human resources, technical skills and physical capacity to gather necessary information on Musk deer;
- Impact of tourism (in some utility zone) toRed panda and its habitat.
- Inadequate information on status, distribution and ecology of Red panda;
- Increasing anthropogenic pressure to red panda and its habitat from the people living in and around MBNP.

Activities

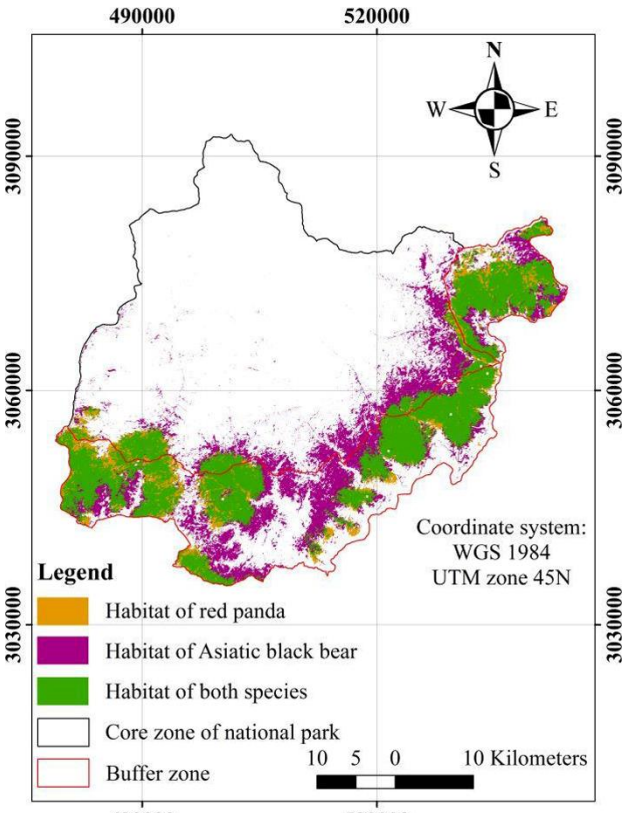
- Carry out the studies on Red Panda occupancy, population status, distribution and habitat suitability.
- Conduct regular monitoring of Red Panda in identified important areas.
- Carry out the studies on bamboo diversity, distribution and phenology in Red Panda habitat considering potential climate change impacts.
- Study feeding and nutritional ecology.
- Study Red Panda's ecological and behavior through cutting-edge technology (satellite/radio collaring, camera trapping etc.).
- Conduct national Red Panda population survey based on genetic analysis (or any other appropriate techniques).
- Establish and maintain a database on Red Panda information.
- Study climate change impact on Red Panda and its habitat.
- Establish climate monitoring plots.
- Update scientific information on red panda ecology and conservation;
- Red panda conservation zoning and habitat management;
- Manage the natural habitat of the red panda;
- Enhance and promote awareness of red panda conservation.
- Conduct researches on poaching and illicit trade of Red Panda.
- Conduct awareness campaigns on Red Panda, anti-poaching and conservation laws.
- Conduct capacity building trainings and exposure visits for frontline staff.
- Strengthen the wildlife crime investigation process and enhance the evidence collection system.
- Establish and functionalize community based anti-poaching units at local level.
- Organize transboundary cooperation with QNNP of TAR, China.

- Strengthen informant networks, information gathering and communication networks for anti-poaching operation.
- Equip enforcement agencies with necessary logistics (equipment, field gears etc).
- Conduct capacity building program for community-based organizations.
- Formulate rules for the guard dogs and control presence of feral dogs in Red Panda habitats.

7.4 Himalayan Black Bear

Status

Most bear species are declining in numbers due to increased human activities, including habitat alteration or destruction, increased human settlements, and activities such as livestock grazing in bear habitat, shifting cultivation, poaching, unregulated killing for sport, and retaliatory killings attributed to depredation of crops and livestock (Servheen et al. 1999). Asian bears face a combination of these threats, exacerbated by inadequate knowledge about their status, distribution, and requirements for survival. The International Union for the Conservation of Nature (IUCN), Bear Specialists Group (BSG) has indicated that Asiatic black bears (*Ursus thibetanus*) are at risk in many areas of Southeast Asia, and lists the initiation of surveys for their status and distribution as a priority action for bear conservation (Servheen et al. 1999).



Map 18 :Potential Habitat of Asiatic black bear
Source : Bista et al., 2016

It islisted in Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES, 2017), and is listed as endangered by the International Union for Conservation of Nature red list (Glatston A, 2015).

There is 647 km^2 of suitable habitat for Asiatic black bear throughout the MBNP area . The buffer zone contains 484 km2of the suitable habitat of the Asiatic black bear. Remaining potential habitat is covered by the core zone of the national park (Bista et al., 2016).

Significance

The species prefers mixed temperate oak (*Quercus semecarpifolia*) forests in Nepal (Chettri M, 2013). It has been recorded between 1600 m to 3200 m in central Nepal (Bista R et al., 2013), although its preferred elevation, at least in some areas, is between 2500 m and 3000 m and its altitudinal limit is 4300 m (Garshelis D et al., 2017). The Asiatic black bear isfacing anthropogenic pressure across its range, including habitat loss and fragmentation, poaching, and capture of bear cubs for sale (Escobar LE et al., 2015, Ahmadzadeh F et al., 2008). In addition, human-bear conflict exacerbates existing threats. Asiatic black bears can cause major damage through livestock and crop (mainly maize) depredation, and may also attack humans (Jamtsho Y et al., 2016, Charoo SA et al. 2011, Awan MN et al., 2016, DNPWC, 2010). In Nepal, bears were responsible for 12% of all wildlife encounters that resulted in death or injury between 2010 and 2014 .

The frequently reported number of conflicts with humans, livestock depradation and crop raiding in BZ areas is in increase to imply that there is threat of reatialiatory killings of this species. Record of HWC due to black bear is tabulated. If the ongoing bear-human conflict is not minimized the retaliatory activities of the local people can come to rise that can severely affect the entire conservation effort.

Another threat for black bears have been poaching for body parts. Recently, a person was apprehended with carrying paws of black bear from BZ area of the Park, an indication of illegal trade of black bear body parts rise.

Conservation Efforts

- It is listed in Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES, 2017), and is listed as endangered by the International Union for Conservation of Nature red list.
- The NPWC Act provisions ‘a fine ranging from NPR 20,000 to NPR 50,000, or an imprisonment ranging from six month to 1 year or both for offenders and accomplices convicted for illegal trade in Himalayan black bear body parts.
- The National Wildlife Crime Control Coordination Committee (NWCCCC) and Wildlife Crime Control Bureau (WCCB) and its respective district units tackle illegal wildlife trade and poaching of endangered species including Red Panda.
- To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011.
- Image of Himalayan black bear is used in the official logo of MBNP as its symbolic wildlife;

- Regular periodic patrolling and habitat monitoring;
- Awareness activities to various groups including school students and teachers, shepherds, BZCF users, etc;
- Conservation messages sharing through local media (FM and newspapers)
- Conservation materials printing and distribution.

Issues

- Inadequate scientific information on status, population, distribution and ecology;
- Increasing ambulation in farming region of BZ far away from the core area;
- Increasing conflict (human, livestock depradation and crop depredation);
- Forest fires, the traditional transhumance system of livestock herding, firewood collection, bamboo and non-timber forest products (NTFP) collection inside the Park area;
- The construction of hotels, roads, and hydropower plants inside Park and BZ areas.
- Despite some awareness activities carried out in BZ areas, there is yet a very limited awareness level amongst different stakeholders;
- Effect of climate induced changes in habitats inside the Park and BZ areas;
- Opening of new trade route to Tibet Autonomous Region (TAR), China from Kimathanka has been identified as illegal market places;
- Lack of field-level transboundary meetings and information sharing;
- Inadequate human resources, technical skills and physical capacity to gather necessary information on Black bear;
- Impact of tourism (in some utility zone) toblack bear and its habitat.
- Inadequate information on status, distribution and ecology of Himalayan black bear;
- Increasing anthropogenic pressure to Black bear and its habitat from the people living in and around MBNP.

Activities

- Carry out the studies on Himalayan black bear occupancy, population status, distribution and habitat suitability.
- Conduct regular monitoring of the species in identified important areas.
- Study Himalayan black bear's ecology and behavior through cutting-edge technology (satellite/radio collaring, camera trapping etc.).
- Conduct Himalayan black bear population survey based on genetic analysis (or any other appropriate techniques).
- Establish and maintain a database on Himalayan black bear information.
- Study climate change impact on black bear and its habitat.
- HImalayn black bear conservation zoning and habitat management;

- Enhance and promote awareness of this species conservation.
- Conduct researches on poaching and illicit trade of black bear.
- Strengthen the wildlife crime investigation process and enhance the evidence collection system.
- Establish and functionalize community based anti-poaching units at local level.
- Organize transboundary cooperation with QNNP of TAR, China.
- Strengthen informant networks, information gathering and communication networks for anti-poaching operation.
- Equip enforcement agencies with necessary logistics (equipment, field gears etc).
- Conduct capacity building program for community-based organizations.

7.5Pangolin Conservation

Status

Pangolins are popularly known as 'Salak' in Nepal. Only eight species of pangolins survive in the wild (Corbett and Hill 1992, Gaubert and Antunes 2005). Of these, four species occur in Asia-the Indian pangolin (*Manis crassicaudata*), the Palawan pangolin (*M. culionensis*), the Chinese or Formosan pangolin (*M. pentadactyala*), and the Malayan or Sunda pangolin (*M. javanica*). Only two species are recorded in Nepal: Chinese Pangolin or Formosan Pangolin (*Manis pentadactyla Linnaues*, 1758) and Indian or thick tailed Pangolin (*M. crassicaudata Gray*, 1827) (Shrestha, 2003). Chinese Pangolin prefers sub-tropical region (1000-2000m) whereas Indian Pangolin are found in tropical region below 1000m (Chakraborty et al., 2002).

In Nepal, Pangolins are found in diverse areas ranging from Terai to the mid-hills occupying different habitats from grasslands, reforested areas, bamboo and coniferous forests and agricultural lands. Despite wide distribution of Pangolin, limited information is available on overall status of these species in Nepal, mainly due to insufficient studies focusing on the ecology of this species. Habitats of pangolins, however, are seen to be abundant. Since, habitats of pangolins are found close to human settlements; the have been threatened by humans. Their habitats outside Protected Areas (PA) are severly degraded due to climate induced disasters including prolonged drought, fire and landslides.

Significance

The GoN has listed both species of pangolins under schedule I of NPWC Act, 2029. Both species of pangolins found in Nepal are categorized as endangered by National Red List of Mammals (Jnawali et al., 2011, Amin et al. 2018). CITIES Act 2074 also prohibits any illegal taking, killing and trading of wildlife species. However, pangolins have been exploited locally for decorative material, food and traditional medicines through history. This continues till today, and main threat to pangolins today is hunting and poaching for illegal international trade. This typically involves live pangolins, and their meat and scales, which are primarily destined to East Asia, most conspicuously China and Vietnam.

Conservation Efforts

- Both species are listed in schedule I of National Parks and Wildlife Conservation (NPWC) Act, 2029.
- It is listed in Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES, 2017), and is listed as endangered by the International Union for Conservation of Nature red list.
- The NPWC Act provisions 'a fine ranging from NPR 500,000 to NPR 1,000,000, or an imprisonment ranging from five years to 15, or both' for offenders and accomplices convicted for illegal trade of itsbody parts.
- The act also has provision to reward the informants with an amount up to NPR 25,000 for aiding in seizure of its body parts or arrest of pangolin criminals.
- GoN has promulgated CITIES Act, 2074 which prohibits any illegal taking, killing and trading of pangolins and their body parts.
- The National Wildlife Crime Control Coordination Committee (NWCCCC) and Wildlife Crime Control Bureau (WCCB) and its respective district units tackle illegal wildlife trade and poaching of endangered species including Red Panda.
- To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011.
- DNPWC, Central Intelligence Burea (CIB) and WCCB have been working closely to control poaching.
- Most notably, Pangolin Conservation Action Plan (2018-2022) has been prepared and is under implementation.

Issues

- Limited information and knowledge on pangolin ecology and population dynamics.
- Pangolins are hunted for local consumption of meat and medicinal purpose and use in garland such as boots, belts and handicrafts;
- Increasing demand for pangolin body parts in the international black market;

- Loss of habitats due to fragmentation and erncroachment of forest and fringe areas for agricultural expansion and development of Infrastructures;
- Extraction of red soil for domestic use causing habitat degradation, loss of burrows and disturbance;
- Frequent wild fires;
- Climate change can cause prolonged dry spells, heavy rainfall, floods and flash floods resulting in possible scarcity of water resources.

Strategies

- Enhance understanding and knowledge on conservation status, ecology and habitat dynamics of pangolin through engaging academic and research institutions;
- Identify and manage priority sites to improve habitat quality for pangolin conservation;
- Curb poaching and control illegal trade of pangolins;
- Develop local stewardship for conservation of pangolin; and
- Develop awareness packages for policy makers, developers, local government and local communities.

Activities

- Design and conduct scientific studies on population status, distribution, space use, behavior and habitat requirement of pangolins in potential and priority areas;
- Conduct awareness campaigns on pangolin conservation;
- Organize regular coordination meetings at local and regional level for sharing information on pangolin related activities;
- Organize regular trans-boundary conservation cooperation meetings with neighbouring countries;
- Formulate and implement mitigation measures for development and other construction works in the prime/designated pangolin habitats; and
- Assess local knowledge, traditions, attitude and perceptions on pangolin conservation.

CHAPTER 8 – TOURISM AND INTERPRETATION

Tourism in protected areas should not only be limited to providing recreational activities for visitors and generating park revenue but it should be an effective means to raise awarenessamong visitors through nature education and maximize the benefit to local communities in arousing public support for conservation. Tourism in the park should aim atenriching visitors' experience as well as informing them on conservation needs and theiranticipated role in protecting natural and cultural heritages for the future generation.

Interpretation is a process to communicate the message on natural and cultural heritageusing objects, artifacts, landscapes and sites. Information is simply a fact whereasinterpretation is an art of disseminating information. Thus, interpretation is not themessage we communicate to visitors but it is also about how the communication is made.Interpretation enhances understanding ofvisitors about protected area and need for its conservation and they are supposed to appreciate thenature and in turn support toconserve it.

Tourism in protected area should be developed and managed at a level that benefitsconservation. It is evident that tourism generates revenue for conservation andconservation promotes tourism. Sustainability of conservation will be enhanced if tourismcould support for livelihoods of local people. The issue here is how to create a win-winsituation, eco-tourism promotion in real sensecould serve the purpose. Tourism withenvironmentally responsible travel to experience the nature while promoting conservationand economically contributing to local communities is regarded as eco-tourism. Thus,tourism in protected area should be ecologically sustainable, economically viable andsocially acceptable that will ultimately enhance wilderness experience and contributes toconservation and livelihoods of local communities.

8.1 Background

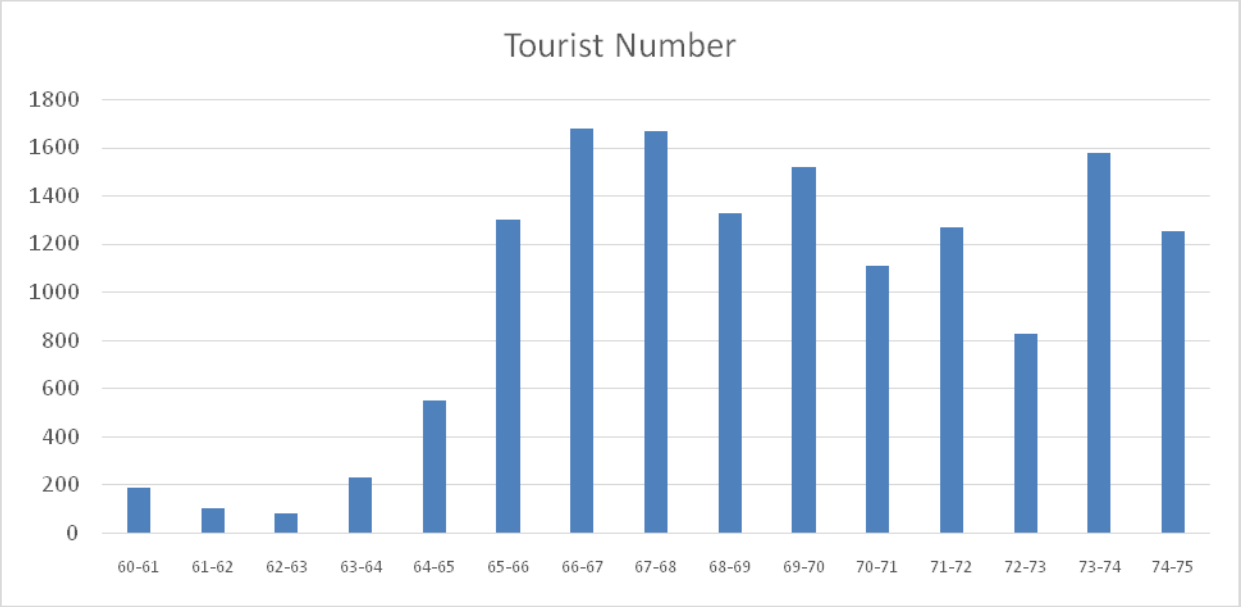
Tourism Scenario

The link between PAs and tourism is as old as the history of PAs and they are established primarily to preserve wildlife population, habitat, natural landscape, cultural and natural heritage. Tourists visit the Parks to understand and appreciate the values for which the area was established and to gain personal satisfaction. Though the relationship is complex and sometimes adversial, tourism is always a critical component to consider in the establishment and management of PAs.

Nowadays, tourism has become a major sector of economic activity which indicates that it will continue to grow in the years to come. This growth and new trend is expected to provide positive contribution for the development of potential surrounding areas and their communities by

meaningful travel experience, including such aspects as cultural authenticity, contacts with local communities, and learning about flora, fauna, special ecosystems and natural beauty in general, and its conservation.

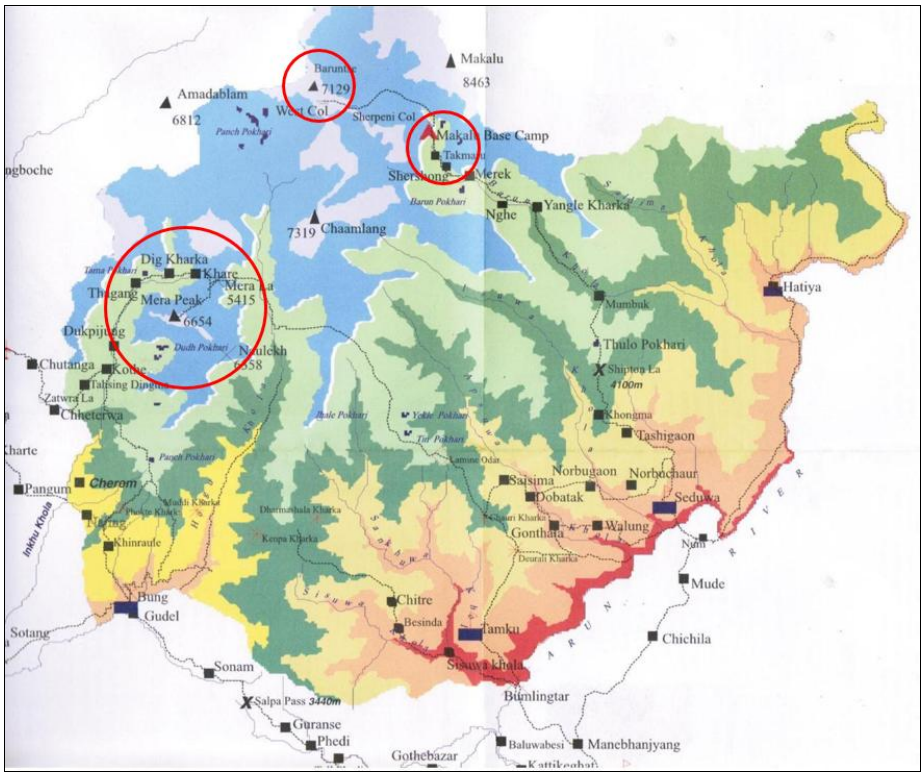
Tourism in MBNP area started since 1950 just like in Sagarmatha National Park. The major tourist attractions of the MBNP are the pristine and rich biodiversity including endangered species like Snow leopard, Musk deer, Red panda, pangolin and Asiatic black bear. The cultural practices of the indigeneous ethnic groups like Rai in Bung and Tamku sector, Sherpa in Seduwa sector, and Bhote in Hattiya sector are interesting for tourist attraction.



Map 19 Number of tourist annually from FY 2060/61 to 2074/75 in MBNP

Recent 15 years of record shows that tourism in this park has significantlyincreased when compared to early years. The highest number of tourist, (1678), was recorded in fiscal year 2066/67(Figure 8). Since then, the number has been wavering. The tourist entry fee constitutes major source of park revenue each year. The tourist record of MBNP is presented in Annex 6.Currently there are 91 hotels operating illegally in total. None of them have been registered in the Park. Their details including name and location are listed in Annex 9 and the relevant map can be seen in figure 8.

There are two peak seasons for visitors in MBNP; one is September to November (Ashoj/Kartik) and another between the month of March and May (Chaitra/Baisakh). More than 85 % of the total visitors come to visit MBNP during these two seasons. Among them more than 80% come to Mera Peak area, most of the remaining come to Makalu area and a very few visit other parts of the park.



Map 20 Tourist routes in MBNP area

Interpretation Facilities

Visitor travel to see, experience and learn about natural or cultural landscapes, sites, features, objects, people, events, heritage and stories. Interpretation facility centre provides them the potential tourism products to see activity they can be involved, do's and don'ts inside the Park and BZ area. The MBNP has a visitorcenter established in Seduwa (MBNP Headquarter) but due to lack of proper resources it needs to be upgraded. MBNP has planned to establish Visitor Information Centre (VIC), where there will be ticket counter, display centre providing information, video documentary showing hall, museum, souvenir shop and rest room. In addition to this, two VIC will be established in Bung and Hattiya sector to provide first hand information about MBNP. In the entire ticket counter, minimum information providing display boards will also be placed so that visitor can get information while they wait in a queue. Similarly, big hoarding boards will be placed in major campsites.

Issues

- As the Park is situated in Eastern Himalyan region it is not easily accessible for tourists;
- The Park receives few number of foreign tourists as compared to other PAs.
- Inadequate infrastructures for tourism;

- Inadequate tourism policy and dedicated institutional setup to deal with the tourists in the park;
- As the trekking routes are aligned through the Barun valley and Inkhu valley in Core area disturbance to wildlife and habitat is a major issue;
- Inadequate presence of Park posts in trekking routes for monitoring of tourists activities;
- Garbage management;
- No interpretation facilities in the park;
- Problems in solid waste management caused directly or indirectly by tourism;
- Limited conservation awareness programme for local community and visitors.

8.2 Tourism Management Activities

- Tourism coordination committee meeting;
- Construction of efficient interpretation/visitor center at HQ and sectors;
- Construct and upgrade of necessary infrastructures like trekking trail, wooden bridge, micro hydro power, view tower, sign posts, information boards, etc;
- Encourage entrepreneurs for connecting wireless internet along Makalu Base Camp route (organizing a tour for entrepreneurs);
- Develop home stay tourism facilities in collaboration with stakeholders;
- Nature guide management (Training and registration);
- Form and mobilize hotel management committees/ groups;
- Train local communities on home stay tourism management/hospitality management, and garbage management;
- Establish community based garbage/solid waste management system (Seduwa sector and Bung sector);
- Garbage management with coordination with stakeholders;
- Conduct bird watching, flora exploration, cultural tour, alpine jungle walk, and other recreational activities as a tourism package;
- Publish and update pamphlet related to potential tourism sites of MBNP;
- Coordinate with related Ministries to declare visit Makalu-Barun National Park year;
- Promote cultural activities (ethnic songs and dances, indigenous food items, dress etc) by organizing contests, competitions, and exhibitions;
- Coordinate with tourism authorities to promote local art and craft in tourism market;
- Cultural museum establishment and operation in coordination with BZMC and BZUCs.

8.3 Culture, Tradition and Religious Sites

MBNP and BZ covers parts of Bhot Khola rural municipality, Makalu rural municipality, fully encompasses Siluchung rural municipality in Sankhuwasbha district and parts of Maha Kulung rural municipality in Solukhumbu district (figure 2). The major ethnic groups are Rai (Kulung, Yamphu, Mewahang, Bhote (Singsawa), Sherpa and the other casts include Dalit, Chhetri and Bhraman. All the different groups have their own culture and tradition and are appropriately harmonious with each other.

The park is of major religious and cultural significance in Nepal since it abounds in sacred mountains and holy places. According to a belief from the Nyingma school of Tibetan Buddhism, there are places which Padmasambhava blessed as refuges called Beyul meaning hidden valleys; Barun Valley is one of them. Other religious sites are Arun-Barun Dobhan, Shiva Dhara, Kenpa/Gaubitta. Two of major religious sites have been identified this management plan.

8.3.1 Saisima (Conservation and promotion of a religious place)

Context

Saisima lies about 100 kilometres north of the district headquarter Khandbari at an altitude of 2650 meters form the sea level. It takes about three-day normal walk from Khandbari. Administratively it lies under Silichong Gaun Palika (Village Municipality) ward 5, (previously it was Yaphu VDC ward number 5). It is the only settlement inside core area of MBNP and is surrounded by forests in all the directions. The nearest village, Gaunthalal, a Sherpa village, is three-hour walk from here to the south.

This is a religious place, especially for the Buddhists and has Buddhist Monastery and few small huts. The monastery is also considered one of the oldest in this area and around 40 monks and nuns live here for study, meditation and protection of the holy place. According to social rule, it's mandatory for the second elder daughter of a family is consecrated a nun to join the Saisima Monastery. Due to the purity in environment, silence and religious importance many monks come to this historic monastery for meditation and education. Occasionally tourists also pay a visit to Saisima.

In the devastating earthquake of 2072 BS, the monastery and cloisters were severely affected. The chaos was aggravated by a catastrophic landslide the same year. The nuns, monks and the locals have planned to construct a new monastery little west from the broken one.

A cave with the length of around 150 meters dwells in the area of Saisima, which is known as Khempalung. Local myth believe that this cave is connected to the cave in Shiva Dhara Parwati Cave, above Yangle Kharka on the way to Makalu Base Camp.

With religious, cultural and geographical values, this place has potential for tourism and also being the only settlement inside core area it deserves to be have more supervision and protection by MBNP.

Way to Saisima from Khandbari

- Khandbari to Heluwa Besi (1 hour 30 minutes ride)
- Heluwa Besi to Bumlingtar (1 hour walk)
- Bumlingtar to Sisuwatar (3 hours walk)
- Sisuwatar to Tamku (3 hours walk)
- Tamku to Gofatar (3 hours walk)
- Gofatar to Deurali (5 hours walk)
- Deurali to Gauthala (2 hours walk)
- Gauthala to Dobhatak (2 hours walk)
- Dobhatak to Saisima (2 hours 30 minutes walk).

Issues

- Long distance from the district and park headquarters with a difficult accessibility;
- Lack of regular coordination between MBNP and the monks, nuns and local people who worship Saissima;
- Insufficient promotion at a national level for international and religious tourism;
- Marred by natural disasters;

Activities

- Construct and improve walking trails to Saisima;
- Construct wooden bridges that come across the walking trails;
- Establish a religious site conservation committee under the jurisdiction of MBNP;
- Prepare promotional brochure that highlight the importance of Saisima and distribute nation-wide and also through MBNP website;
- Disseminate religious and cultural values through mass media; locally and nationally;
- Support reconstruction of monastery;

8.3.2 Barun Mela in Barun Dobhan (Conservation and promotion of a religious place and festival)

Context

Barun Dobhan is a confluence of the mighty River Arun that flows from Tibet and River Barun which originates from Dudh Pokhari at the base of Mt. Makalu. River Barun is called

Chhukchuwa by the Bhote people of Sankhuwasbha which means river originated from a two holy ponds. Both of these rivers are perennial and major tributaries of Sapta Koshi.

According to local religious myth, the Barun River that originates from Dudh Pokhari carries with it water from holy places like Shiva Dhara, Laxmi Pokhari, Buki Tham, Thulo Pokhari, Saldima Valley and thus it is believed that the water of this river is used by Gods and Goddesses. Followers of Buddhism and Baoanism Deities of the above mentioned places gather on every full moon and no moon to talk about benevolence of mankind and the world. On the occasion of Maghe Sankranti (the first of Magh in Nepali Calendar) the gathering is considered a grand one and thus the believers come to celebrate the pilgrim on this day, and is popularly known as Barun Mela. Hinduism however, believe that Baruneswor Mahadev bathes in the Shiva Dhara, a natural falling water from the middle of an overhanging cave and the water flows as River Barun.

Barun Dobhan and the entire Barun Valley (one of the Beyuls, a hidden valley) displays an exemplary flourishment of Buddhists and Hindus together. Two Buddhist Monasteries and a Shiva Temple exist in Barun Dobhan. The annual fete "Barun Mela" is a huge attraction for religious people across the region.

On 7th Baisakh 2073, outburst of Langmalay Glacial Lake caused serious damage along its watercourse affecting Yangle Kharka and Barun Dobhan. The under construction Biratnagar-Kimathanka Highway that is to pass from Barun Dobhan poses both opportunities and threats to this Holy place. It can promote religious tourism as well as cause pollution and damages to the pure milieu.

Issues

- Insufficient promotion at a national level for religious tourism;
- Flow of religious admirers only for a day (Barun Mela);
- Inadequate mechanism to control the pollution and crowd;
- Marred by natural disasters;

Activities

- Establish a religious site conservation committee under the jurisdiction of MBNP;
- Prepare promotional brochure that highlight the importance of Barun Dobhan and distribute nation-wide and also through MBNP website;
- Disseminate religious and cultural values through mass media; locally and nationally;
- Support in construction and maintenance of monastery and temple;
- Construct shelter house that favours pilgrims, tourists and local travellers;
- Build solid waste management mechanism;
- Renovate the ruined structures;
- Arrange and provide security during Barun Mela.

CHAPTER 9 –SPECIAL PROGRAMME

9.1 Saldima valley, Barun valley

9.1.1 Context

Saldima Valley and Barun valley is proposed only strict nature reserve of Nepal(NBS, 2002). However, it has not been announced so. These are the most pristine areas in MBNP and are considered one of the most inaccessible areas in the park. The nearest settlement of this valley is 3 day trail walk distance. This feature has safeguarded a variety of alpine plants and animals here. River Saldima, which gave the Valley its name, traverses through this purest valley and contributes its water to River Barun. It has been identified for its unique geography and diverse biodiversity in the lap of alpine mountains.

Saldima valley is also a valuable place in the history of conservation in Nepal. A 10-day seminar known as "Salima Seminar" was organized in 2043 BS to highlight the ecological importance of this place which finally led to the establishment of MBNP. The attendents in the seminar were chief guest being the then King Birendra and other guests being high ranked officials of Nepal, academic professionals and conservation scholars from national and international arena. The seminar followed by a series of investigation, field reports and background papers and the Working Papers the publication.

The upper part of Park area include historical and pristine Saldim and Barun valleyis proposed as a Strict Nature Reserve Zone (IUCN Ia category). The rationale, objectives and management approach for managing this zone as strict nature reserve modality is described below briefly.

Rationale

1. The government designated the national park in an area free of human settlements with no historic records of human residence inside the Park area due to which these areas are not liable to any form of human activity and interventions.
2. The Zone treasures some of the last remaining pristine forests and alpine meadows in the world. The landscape consists of mountain peaks, glaciers, high altitude lakes, pastures, forests and rivers. Due to rough and irregular terrain these areas are still intact and undiscovered. So, these areas have high biodiversity conservation values because of their undisturbedhigh mountain geological/geomorphological features, ecology and landscapes.
3. Trans-boundary linkage with Qomolangma National Park of Tibetan Autonomous Region of China in the North and Sagarmatha National Park in the West can only be achieved by protecting these areas strictly.

4. This Zone covers 3terrestrial eco-regions out of 4 terrestrial eco-regions of MBNP, namely (i) The Eastern Himalayan Broadleaf Forests, (ii) Eastern Himalayan Conifer Forests and (iii) Eastern Himalayan Alpine Shrub and Meadows.
5. The skyline is a panorama of rugged Himalayan peaks including Mt. Makalu (8463m), the fifth highest mountain in the world.
6. Situated in one of the highest regions of the world, the Park area is of significant scientific value and offers unique research opportunities to scientists. As very few studies and researchs are carried out in these areas very little is known about the ecological and biological values.
7. Saldima valley, Barun valleyare considered to be of global significance, and can act as a living laboratory for international scientific research. Plants like *Swertia Barunensis* (4200m) and *Potentilla Makaluensis* (4000 m) nomenclatured under the name of river Barun and Mt. Makalu are endemic to Barun Valley.
8. The area provides habitats for rare and endangered species such as Snow leopard (*Uncia uncia*), Clouded leopard (*Neofelis nebulosa*), Asiatic golden cat, Leopard cat (*Felis bengalensis*), Red panda (*Ailurus fulgens*), Musk deer (*Moschus chrysogaster*), Grey wolf (*Canis lupus*), Wild dogs, Himalayan Black bear (*Selenarctos thibetanus*), Common leopard (*Panthera pardus*), Jackal (*Canis aureus*), Himalayan Tahr (*Hemitragus jemlahicus*), and Goral (*Nemorhaedus goral*), most of which are on the CITES list and also protected by government.
9. The glaciers and lakes inside thesePark areas are of high hydrological value for wildlife and downstream communities. Several rivers originating and flowing throughthe Park area support diverse aquatic ecosystems home for endemic and rare amphibians and Pisces.
10. Many vulnerable glaciers, glacial lakes and ecosystems due to climate change are situated inside the proposed zone whose credibility can be restored with minimal management intervention.

Main management Objectives

1. Total priority will be given for conservation of species, habitats, ecosystems, landforms and landscapes.
2. Will be developed as a baseline monitoring site for monitoring the relative impact of human activities in PAs. Only limited,nondestructive, management orientedmonitoring, and research will be allowed inside the Zone.
3. All kinds of humans' visitation other than stated in point no. 2 will be restricted.
4. Natural ecological processes will be maintained with minimal management intervention and without infrastructure development.

Management approach

1. Total protection of the zone through patrol, enforcement and monitoring.

2. Absence of any facilities that would assist access or use.

MBNP is increasingly influenced by human activities, there are progressively fewer areas left where such activities are strictly limited. Without the protection accompanying, there would rapidly be no such areas left. These proposed areas with such characterstics, become an apposite site for strict protection and focus intensive scientific study. To do so, these areas has to be designated as an area where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.

9.1.3 Activities

- Strictly prohibiting permit of any entrance in these areas other than scientific research and conservation monitoring through a consensus of BZMC and other relevant stakeholders.
- Finding alternative grazing grounds for herders and an alternaive trekking route for tourist.
- Zonation of these areas;
- Conducting an extensive scientific research on biological diversity in the zone.
- Proposing these upper areas of the Park as the first Strict Nature Reserve of Nepal through DNPWC and MoFE.

9.2 Initiation and promotion of PES (Context, Issues, Strategies, Activities)

9.2.1 Context

Payments for ecosystem services (PES), also known as payments for environmental services (or benefits), are incentives offered to farmers or landowners in exchange for managing their land to provide some sort of ecological service. PES has also been touted as a tool for rural development and if applied it could have significant results in supporting livelihoods of the entire communities living in the uplands like areas of MBNP. The payment of environmental services that MBNP provides to lowlands could favor conservation by active people's participation in perpetuity.

9.2.2 Issues

- Local people have negligible knowledge on PES and its benefits;
- MBNP has not projected any formal programs related to PES, Climate Change (CC) and global warming;
- Lack of organizations that work on PES in MBNP area.

9.2.3 Strategy

- Rigorous public awareness meetings and workshops about CC, global warming and PES at various levels, groups and committees;

- Include CC mitigation and small scale PES sections in community forest operational plan as a first step.
- Inclusion of PES mechanism in EIA study of hydro power projects, roads and other development projects.

9.2.4 Activities

- Coordination with conservation partners and other related stakeholders to introduce piloting of PES in MBNP;
- Preparation of local adaptation plan at BZUC level (LAPA);
- Coordination with hydro power projects, roads and other development projects to include PES mechanism in their EIA study.

9.3Climate Change Adaptation

9.3.1 Context

A global survey has indentified that Nepal is the fourth most vulnerable country to climate change in the world (Mapplecroft, 2011; see www.mapplecroft.com for details). The annual mean temperature in Nepal generally decreases from the south to the north as elevation rises. In mean annual distributions, the Tarai region has maximum temperature of more than 24°C and the northern high mountainous region has the lowest minimum temperature of less than 4°C. Among three ecological zones of Nepal, high mountain has the highest rate of temperature rise. Annual warming trends of 0.04^0C (Practical Action 2009) to 0.06^0C (Shrestha *et al.* 1999) have been reported for Nepal Himalaya. Because of its high altitude location, MBNP falls in high exposure to climate change risk zone of Nepal.

The overall climate change vulnerability index for Nepal revealed that Solukhumbhu and Sankhuwasabha districts belong to high and moderate vulnerable districts respectively (MoE 2010). The district level climate change vulnerability assessment indicates that both districts are highly vulnerable to Glacial Lake Outbrust

Flood hazard (GLOF). Nine of the new glacial lakes have been formed in the Hinku and Hongu valley. These lakes are supposed to at high risk of GLOF (Byers 2013).The vulnerability of drought and landslide hazards is high and moderate for Solukhumbu and Sankhuwasabha respectively.

Shifting of phenological events as reported from other hilly areas of Nepal (e.g., HELVETAS 2011) is also a major concern in MBNP. The pre flowering of Rhododendrons ("Chaitra/Baisakh–Paush") is reported in MPAs including MBNP.Water table is uncertain with an increase of erratic rainfall events. There are more rainy days observed in pastures compared to the snowing days in recent years.

9.3.2 Issues

- Shifting of phenological events;
- Drying of rangelands;
- Emergence and spread of invasive species in recent years;
- Inadequate preparedness for glacial lake outbursts;
- Extended dry spells increasing fire risks;
- Destroying the habitat of endangered wildlife species such as the snow leopard, musk deer and red panda; and
- Disastrous effects of flooding resulting from GLOFs on human lives, threatening human settlements downstream.

9.3.3 Strategies

- Enhance knowledge and understanding regarding climate change impacts on species, ecosystems and local communities through research and documentation;
- Improve ecosystem resilience through management of climate induced stresses mainly extended dry spells;
- Strengthen Community based disaster risk management and climate adaptation;
- Promote climate resilient livelihood diversification;
- Enhance capacity of Park staffs, Security persons, and BZ communities to cope with the climate change impacts; and
- Coordinate and collaborate with key stakeholders and line agencies to mitigate impacts of climate induced disasters and change.

9.3.4 Activities

- Initiate monitoring the most dangerous glacial lakes of the region regularly to assess changes that could possibly cause GLOF events;
- Install automated early warning systems to increase the coping capacity of the local communities in the case of GLOF disasters;
- Establish evacuation centres to facilitate the local communities in the affected areas in the case of GLOF disasters;
- Support to institutionalize the Disaster Risk Management Committee.
- Make formal and informal arrangements for collective security against the effects of climate change;
- Study impacts of changes in precipitation and temperatures on species and ecosystem;
- Identify climate sensitive indicators in the Park and closely monitor them;
- Identify and support implementation of adaptation priorities of BZ community forest user groups such as small-scale irrigation construction, repair and maintenance;
- Study and documentatation of indigenous biodiversity knowledge, skills ans practices;

9.4Garbage Mangement

9.4.1 Context

Most of the solid wastes generated in the Park are composed of organic matter, paper and minor wastes that are mainly reused for cattle feeding and manure, while disposal of other non-degradable categories of collected wastes (glass, metal, and plastic) are not properly managed. Particularly, burning or disposal in open areas poses a great hazard to the human and animal health as most dump sites situated close to the river courses are prone to regular flooding during the rainy season, thereby directly contaminating river-water. Pollutants and microbiological contamination in the water bodies have already been noticed in the area.

This could be due to a number of anthropogenic activities and hazardous practices such as solid waste dump sites, open defecation, and poor conditions of the existing septic tanks both in SNP and its BZ. The collection of data on solid waste and water quality and the compilation of management information on the targeted social-ecological system eased us to develop consensus-building models to be used as management supporting tools. By implementing such models, we were able to simulate scenarios identifying and evaluating possible management solutions and interventions in the Park. This work reveals insights into general dynamics that can support the mission for solutions to waste and water quality management problems in other protected areas and mountain landscapes where traditional livelihood and land use patterns are changing under the influence of a growing population, changing consumption patterns, and international tourism (Manfred *et al*., 2010).

The waste management problem including gas cylinders and plastic bottles is growing in the region. The collection of waste by a single organization without involvement of the local communities and stakeholders is unlikely to be effective in the longrun.

The pollution problem is now no longer confined to solid waste. The water sources along the major trails are being contaminated from improper affluent discharge, human waste, and garbage dumping. Sewerage and toilet waste can be found piped into the nearby streams and rivers. The Park will actively participate in the task of controlling various forms of pollution, and will attempt to make the control system more sustainable by involving the local people with support from the other stakeholders. Similarly, it will focus on reducing waste generation and proper disposal systems.

9.4.2 Issues

- Garbage management is an ongoing challenge to keep Park and BZ clean despite several initiatives already in place;
- Several point and non-point sources of pollution exists in the region;
- Inadequate knowledge on proper disposal and recycling of the solid waste among local communitites;
- Inadequacy of coordinated effort to address the issue of garbage and pollution management in trekking route;

- Problem of managing the garbage and other wastes in Barun Dobhan area during Mela time;
- Lack of guidelines for properly managing the garbage;
- Inadequacy of the fund required for maintaining sanitation in the Park and BZ.

9.4.3 Strategies

- Develop water, sanitation and hygiene guideline for local communities in MBNP;
- Mobilize eco-clubs to raise awareness about importance of solid waste management;
- Work with local government, communities, private sector, and conservation partners to implement sanitation programme;
- Use high tech solid waste management techniques in collaboration with local government;
- Promote recycle, reuse, reduce, remove, and reject (5R) approach to manage wastes in the Park

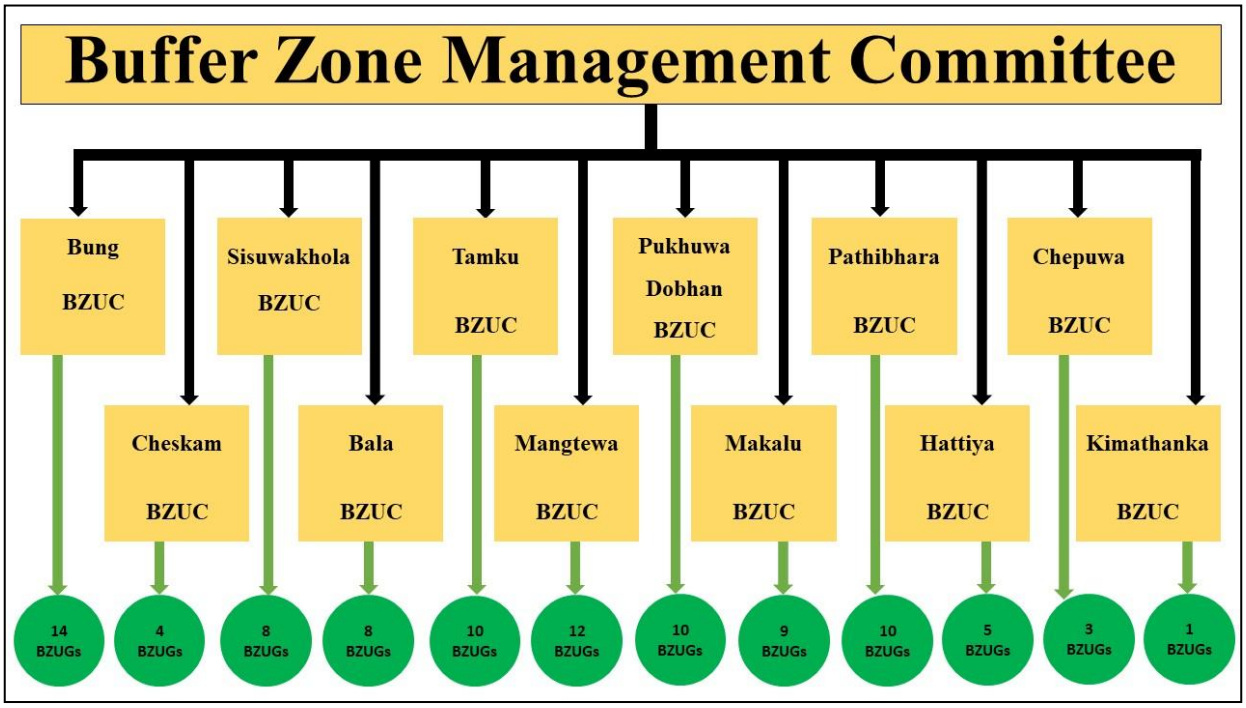
9.4.4 Activities

- Mobilize and involve the local communities and organizations in garbage collection, recycling, and destruction;
- Manage garbage with special focus on reducing production, recycling, and destruction by prohibiting the use of polluting items such as plastic bags and glass bottles;
- Ensure that large settlements in the Park and its BZ have proper sanitation infrastructures including storm water drains, toilets, incinerators, collection and recycling systems;
- Provide support to demonstrate proper techniques of garbage disposal and recycling techniques;
- Construct waste disposal pits or put waste collection pots near entry point, ticket counter and along the trekking routes;
- Provide water supply, toilet, drainage, collection and recycling centre to schools, public buildings, and household with the support from conservation partners;
- Support eco-clubs to organize clean-up campaign regularly.

CHAPTER 10 – BUFFER ZONE MANAGEMENT

10.1 Introduction

The objective of the BZ management is to achieve balance between biodiversity conservation and sustainable livelihood. The expected outputs are to ensure sustainable management of natural resources, to enhance socio-economic opportunities, to increase people's engagement in biodiversity conservation and to manage biological corridors and connectivity.



Map 21 : Buffer Zone Management Committee structure

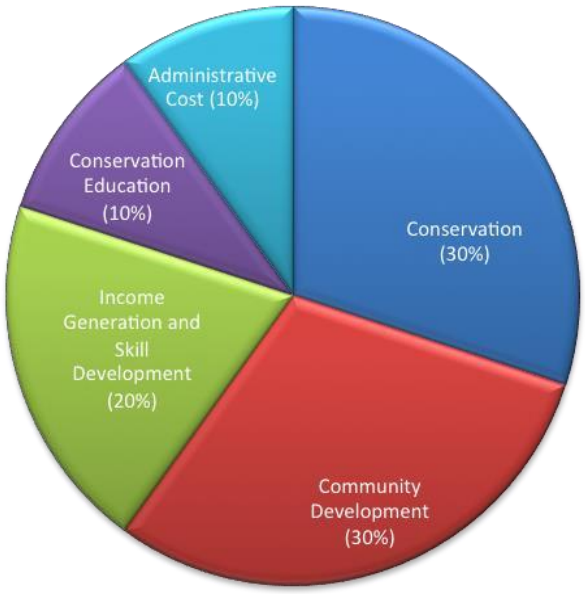
In order to ensure people's participation in conservation, the fourth amendment of the National Parks and Wildlife Conservation Act, 1973 brought the concept of buffer zone management in1993. Buffer zone is an area surrounding a park or a reserve encompassingforests, agricultural lands, settlements, village open spaces and any other land use. The buffer zone programme inNepal is a major strategy to protect the core area of the parkthrough community-based natural resource management in its periphery. The National Parks and Wildlife Conservation Act 1973,Buffer Zone Regulations, 1996 and BufferZone Guidelines, 1999 provide policy and legalframework for buffer zone management in Nepal.

An area of 830 km^2has been declared as the buffer zone of MBNP in 1995. The buffer zone comprises 7680 House Holds with a population of 36,395 (approximately) and is spread over parts of four rural municipality (3 in Sankhuwasabha and 1 in Solukhumbu district). The ethnic composition is dominated by Rai (64%) followed by Singhashava Bhote (18%), Sherpa (8%) and

others (10%). The buffer zone communities are the principal stakeholders. MBNP has institutionalized mechanisms in buffer zone to mobilize funds, minimize bioticpressures in the park resources and motivate communities in the participatory management of forest resources to fulfill their needs of forest products. The Buffer Zone Management Committee (BZMC) is an apex body under which 12 Buffer Zone User Committees (BZUCs), and 94 Buffer Zone User Groups (BZUGs) are formed and institutionalized in MBNPBZ. The long-term objective of buffer zone programme is to motivate local people and to win their support to involve them in nature conservation. The legislation has made a provision of channeling 30-50 % of the park revenue to the communities for the implementation ofconservation and community development programmes. BZ programmes are aimed at institutional development, alternative natural resource development, capacity building,financial management, conservation education and awareness, gender and special targetgroup mainstreaming. In fact, BZ programme is a benefit sharing mechanism which involvessustainable development, tourism promotion and reconciliation of park-people interface.

The buffer zone of MBNP receives 50 % of the revenue generated by park for conservation and socio-economic development annually. BZMC has to allocate 30 % of their budget for conservation, 30 % for community development, 20 % for income generation and skill development, 10 % for conservation education and 10 % for administrative costs.

One of the major programmes of the buffer zone management is to develop alternative forest resource in the buffer zone through community forestry. Thus, MBNP buffer zone programme emphasizes sustainable management and development of the forests through involving local communities as forest user groups. The programme has been very successful with regard to forest resource development and habitat protection in the BZ and community participation in conservation. Till now, MBNP has handed over a total of 37983.76 ha of forest to 95 Buffer Zone Community Forest (BZCF) user groups with 7680 households andfor development, conservation, management and sustainable use.



10.2 Past and Present Management Practices

10.2.1. Forest management

In the past, the area was under the general management and forest areas of the buffer zone were under the control of District Forest Office. After declaration of buffer zone in 1995, all the

community forests of the then 12 VDCs are managed as buffer zone community forest. Before the declaration, there were very few arrangement for wildlife management. But, at present, buffer zone is viewed from the wildlife conservation view point all well and the programmes are directed towards the conservation of wildlife. This area is considered as additional habitat for wild animals.

10.2.2. Other Land use

The major land use in buffer zone other than forested areas is human settlements and agricultural lands. There is few tourism villages coming up in the area and trekking trails and micro-hydro electricity transmission lines has been seen as expanding developmental change in areas of some BZUCs.

10.3 Management Strategies

10.3.1. Zonation

The area of the buffer zone is duly notified and clearly delineated. For management purpose, buffer zone will be further divided into conservation zone, sustainable use zone and intensive use zone as proposed in this management plan.

10.3.1.1. Conservation Zone

The upper belt of forests in buffer zone is as good as core area for wildlife. Thus, these areas will be managed as extended wildlife habitat where extraction of forest products will be limited and the area of BZCF will be limited according to need and possibility of management during renewal of operational plan. But the area will be allowed for regulated tourism activities if needed.

10.3.1.2. Sustainable Use Zone

The forested area in buffer zone which is managed by community for dual purpose of meeting the need of forest products for the households and providing refuge for dispersing population of wildlife falls under this category of zonation.

10.3.1.3. Intensive Use Zone

This is the buffer zone area that includes all the settlements and private lands, where environment-friendly development activities will be carried out to enhance the livelihood of the people living in the area through various developmental inputs.

10.3.2. Community Development

To provide need-based and site specific inputs for the socio-economic development in buffer zone and to reduce the dependency of people on forest resources, the management of buffer zone is oriented towards gathering support of local people through need-based socio-economic development input and participatory forest management. Site specific plans, including livelihood

support initiatives will be the guiding document for implementing developmental initiatives in the respective user committees and user groups.

The priority of the community development will also be to reduce human wildlife conflict which is increasing in the recent years. Main species in conflicts are himalayana black bear, barking deer, mokey and wolf. To minimize the contact of animals and humans projects like macro and micro hydro electricity will be built so that people's dependency on forest for fuelwool will be decreased. Private plantation for supporting stall feeding and fulfilling forest product need to be encouraged. Infrastructure development for tourism proothin will be encouraged to provide alternate livelihood options for the community. Community development programs will be focused to improve traditional livelihood so that their dependency on reserve resource will be diminished in the long run.

10.3.3. Biodiversity Conservation

One of the major objectives of buffer zone management is to develop partnership between the Park and the people in integrated biodiversity conservation. The involvement and active participation of local people is the main thrust of biodiversity conservation not only in buffer zone but also in core area. People will be made aware of biodiversity conservation and several programmes will be launched focusing on different aspects of biodiversity conservation.

10.3.4. Tourism Promotion

Tourism in MBNP buffer zone is at a crawling stage compared to few other PAs in Nepal. To promote community based eco-tourism in buffer zone as a means of sustainable livelihoods for the people living in buffer zone, buffer zone of MBNP has its own tourism potential but few infrastructure and capacity. Thus, all the identified potential areas are to be well documented, promoted and the capacity should be built through various interventions.

10.3.5. Functional Co-ordination

The plan for each UC/UG will be prepared through bottom-up planning process. Most of them have been regularly prepared during the renewal of operational plan. Participation of women and underprivileged community will be ensured in planning andimplementation. In order to prioritize the needs and support to be provided, participatoryranking of the users will be done based on their well-being and proximity of the settlementto the national park. Prior to approval, the provision for reviewing the plan by BZMC will bemade for its refinement and aligning the activities to be supported by other line agencies.

10.3.6. Capacity Building

Park staff as well as members of UGs/UCs needs to be trained in facilitation skill and participatory approaches. The frontlinestaff of the park also need training in basic field instruments used in a wildlife management, and inhouse orientation training in participatory management. Detailed HRD activities will beplanned to include in-house workshops, training, capacity building courses, lecture byresource persons, improvement of skills to positively change

park staff's and members of UGs/UCs' perceptions andimprove their professionalism in park-people cooperation and participatory management.

10.3.7. Income Generation and Skill Development

In order to reduce the dependency of local people in park resources as well as to uplift their standard of living, income generation and skill development activities will be carried out targeting marginalized communities. The fund of the buffer zone will be made available to conduct these programmes.

10.3.8. Conservation Education

In order to develop the positive attitude of local people in conserving biodiversity, severalprogrammes will be conducted focusing on different sectors of the society, *e.g*. school children, mother groups, youth clubs, journalists, tourism entrepreneurs, social activists and related stakeholders. The resource will be available from the buffer zonefund and from the national park as well.

10.3.9. Regulation of Forest Products

The management and conservation of buffer zone forest resources is a matter of great concern. The demand of the forest resources right from the fuelwood to timber is realized to be the major challenge in managing forest resources. Regulation of forest products will be done according to the prevailing government regulations and guidelines.

CHAPTER 11 –ACTIVITY, BUDGET AND LOGICAL FRAMEWORK

11.1 Activity and Budget

The budget required for the implementation of the activities prescribed by the plan for the period of five years is estimated and presented in Annex VIII. The summary of the activities and budget of the management plan for Makalu Barun National Park and its Buffer Zone for the period of five years (2075-2080) is presented in Table 12. For the implementation of activities a total of NRs. 62,34,44,882.00 (Sixty Two Crore Thirty Four Lakhs Fourty Four Thousands Eight Hundred and Eighty Two Rupees) is required giving much weightage to the Park protection followed by tourism development which are around 54 % and 24 % respectively. The next priority is given to research, monitoring and capacity building with about 8 % of budget allocated.

Table 12: Activities and Budget of Management Plan

(Amount in Thousand Rupees)

	Activities	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total amount	%
1	Park Protection	26250	29342	88679	110120	82807	337092	54.07
2	Anti-poaching and Intelligence gathering	1346	1392	1424	1376	1407	8398	1.35
3	Rangeland Management	2150	1686	1070	805	840	6551	1.05
4	Wetland Management	775	1050	3333	1150	930	7238	1.16
5	Species Conservation	1735	1499	1563	1626	3010	9433	1.51
6	Wildlife Health Management	3625	5381	3988	4744	4350	22088	3.54
7	Fire Management	550	656	1238	1208	660	4311	0.69
8	Encroachment Management	950	930	960	990	1020	4850	0.78
9	Research	1650	3728	3465	4830	7080	20408	3.27
10	Monitoring	1625	1904	2203	1889	2560	10180	1.63
11	Capacity building	2525	2888	3713	4198	5490	18813	3.02
12	Tourism	18220	18412	37783	38592	38546	151553	24.31
13	Climate Change	550	1103	330	1208	660	3850	0.62
14	Garbage Management	150	154	157	161	164	785	0.13
15	Buffer Zone Management	1775	2179	2503	2041	2130	10628	1.70
16	Administrative	1315	1470	1435	1495	1555	7270	1.17
	Total	**65191**	**73774**	**153844**	**176433**	**153209**	**623448**	**100.0**

The budget mentioned in Table 12 includes only programme budget. It is estimated that Government allocates annually NRs. 3,84,00,000.00 (Three Crores Eighty Four Lakhs) for administration budget (salary, travel allowance, uniform and ration) and this is projected in five

years with 5% increment for every year. The estimated amount of both administrative and program budget are presented in Table 13. The total budget including administrative comes to NRs. 88,86,29,882.50 (Eighty Eight Crore Eighty Six Lakh Twenty Nine Thousand Eight Hundred Eighty Two Rupees and Fifty Paisa). It shows that for planned period the administrative cost comes around 29.84 % while program cost is 70.16 %. In an average allocated budget from Government is only 24 % and thus 76 % deficit budget is sought to come from conservation partners and other sources. However, the budget of BZUCs are not mentioned here which are presented in Annex 13.

Table 13 : Program and Administrative Budget (Thousands)

Budget Heading	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total	%
Administrative Cost	58930	61876.5	64823	67769.5	70716	265185	29.84
Program Cost	65191	73770.93	153839.87	176431.81	153208.75	623444.88	70.16
Total	**124121**	**135647.43**	**218662.87**	**244201.31**	**223924.75**	**888629.88**	**100**
Government Allocation	30.93	29.72	19.32	18.08	20.58	23.72	

11.2 Logical Framework Analysis

The logical framework of MBNP and its BZ management Plan for five years period 2075/76-2079/80 is presented in Table 14.

Table 14 :Logical Framework of Management Plan

Narrative summary	Objectively Verifiable Indicators (OVIs)	Means of Verification (MOV)	Assumptions
Goal			
Conserve and maintain the unique biological and cultural values, and scenic beauty of the park's landscape for the benefit of the present and future generations	• Enhanced diversity richness and status of endangered species, • Scenic landscape of the park is maintained, • Improved living standard of local community	• Species inventory reports (National and Park level) • Annual progress report • Research papers, study reports • Human Development Index (HDI)/CBS reports, Living standard survey report	Supportive policy and priority of the GoN No occurrence of natural disaster especially GLOFs.
Purpose			
Conserve biodiversity with special focus on globally threatened and nationally protected wildlife and their habitat to maintain ecological functions and processes	• Population of threatened wildlife maintained (snow leopard, musk deer, red panda, Himalayan black bear) • Rangeland habitat is not further degraded • Incidence of forest fire is reduced by at least 10% • Pollution in the wetland catchment is reduced by at least 10% • Control of invasive species	• Census/inventory report , • Annual progress reports, • Satelite data, and office record • Media reports, • Study/research report, monitoring report	

To promote sustainable tourism for inspirational, educational, cultural and recreational purposes	• Trekking routes are safe for walking, • New potential areas of tourism are identified, • Minimum facilities for tourist are available, • Solid and liquid waste management is in respective place, • Awareness level of local communities towards wildlife has improved	• Documentary, Visitor survey report • Feasibility report, Progress report • Annual reports, Media report • Training report, Study report • Economic survey reports • DNPWC reports	Conservation friendly tourism promotion

To strengthen institutional capacity through research, PES, capacity building, coordination and collaboration	• Updated databases • The MBNP staffs delivers both technical and management services effectively and efficiently • The delivery of services provided by Conservation committes are improved • Increased joint venture activities, projects and programmes • Monitoring and patrolling skill of Nepal army in-charges of the posts have been increased	• Annual progress report, • DNPWC reports, reports of correspondence • HRD reports • Media reports	The staffs are not frequently transferred Staff motivation is continued
Outcome 1: Protection of National Parks's resources			
1.1 Zonation of park formed that facilitates parks conservation	Zones are formed clarifying the areas of actions	PA Map showing zones	
1.2 Infrastructure formed that enhanced protection	All the park and army posts are constructed at the strategic locations	Office record/ Annual progress report	
	The basic facilities for communication, drinking water and stay is maintained in the posts	Office record/ Annual progress report	
1.3 Intelligence network improved that reduces the poaching of wildlife	New intelligence network have been formed with few informer	Record of poaching/illegal wildlife trade, Office report	
	Record of wildlife poaching is reduced by at least 50%	Legal case register record	

1.4 Improved park patrolling that enhances park protection	Most of the park is covered by foot patrol from the posts	Patrol report	
Outcome 2: Species conservation and habitat management			
2.1 Threatened wildlife are conserved	Status of snow leopard and black bear population ismaintained	Monitoring report, census/inventory report	
	Status of musk deer, and red panda is improved by at least 5%	Monitoring report and survey reports	
2.2 Wildlife habitat (rangeland, wetland, fire management) are managed	Rangeland are not degraded further and area is not cleared for the expansion of rangeland	Monitoring and survey reports	
	Forest fire incidences are reduced by at least 10%	Monitoring and survey reports	
	Wetland of the tourism trail area is free from solid waste	Monitoring and survey reports	
2.3 Natural Hazards and climate change impact is not threatening the life of wildlife and people	No human life is lost due to natural calamities such as GLOF	District police report, media report	
	Reduced wildlife damagedue to natural calamities	Annual reports, monitoring report	
2.4 Wildlife health is improved	No records of wildlife death due to disease	Wildlife survey/observation record	
2.5 Status of wildlife is updated	Status of threatened and other wildlife is improved periodically	Monitoring report, articles in newspaper	
Outcome 3: Ecotourism promotion has resulted in improved livelihood of local community			
3.1 Trekking routes are improved	All the permitted trekking routes are safe to walk	Office reports/annual reports, visitor survey reports	Political stability is maintained and

3.2 General visitor facilities are improved	Signage's are in place in the cross points and solid waste is managed in all the sites	Office reports/annual reports, visitor reports	improved
3.3 Tourism pressure are diversified	Activities on sport/adventure tourism are explored	Feasibility report	
3.4 Local culture is preserved	The local culture is preserved and shown to tourists on demand	Office reports, documentary, study report	
Outcome 4: Biodiversity conservation and livelihood improvement in BZ			
4.1 Biodiversity conservation in BZCF is improved	Wildlife sighting in BZCFs have been improved by 10% and forest area is increased by 10%	BZ conservation report, number of wildlife shigted by local people, LULC change	
4.2 Human wildlife conflict is minimized	Conflict from bear, monkey and leopard is reduced by at least 20%	Office record	
4.3 Forest and tourism based income is increased	Minimum 5% income is generated by communities from forest and tourism related activities	BZ report, economic survey report	
4.4 Awareness of local people on wildlife is improved	Level of awareness on wildlife is improved amongst local people	Annual progress report, Meeting minutes	
4.5 Basic community development facilities in buffer zone is improved	Education, health, transport and communication facilities is improved	Local political unit reports	
Outcome 5: Institutional capacity Enhancement			
5.1 Capacity of staff to manage park, army for patrolling and UC members to conduct buffer zone activities have improved	Park staff capacity to manage park is improved by minimum of 20%	Annual progress report, HRD report	
	Army patrol unit capacity to SMART patrol is increased	Patrol report, annual reports, DNPWC report	

	BZCF executives capacity to manage respective UCs and BZCFs have improved	BZ reports, annual reports, meeting minutes	
5.2 Funding for plan implementation have been improved	About 10% increase in annual funding from outside the government sector	Financial report	
5.3 Next management plan is prepared by the park team	Review and drafting of the new management plan is done by the park team	New draft plan at the end of 5 year period of the first plan	

11.3 Gender Equity and Social Inclusion

Gender inequality and social exclusion are issues of global concern. Over the last decade, the Asia and the Pacific region has made a remarkable progress on these issues. Nepal is not an exception to this regard. Since last decade, it has been moving ahead by fulfilling all commitments made in the international arena towards non discrimination, gender equality and social justice. In this regard, MBNP needs to better target the delivery of conservation outcomes to the hardest segments of society, those who have been excluded from the development outcomes and those who have been overlooked.

MBNP will adopt Gender Equality and Social Inclusion (GESI) strategy as a cross-cutting theme. The implementation of GESI strategy will be participatory and inclusive as possible. At the program level the focus will be laid to identify whether the program is GESI responsive, embraces inclusive approaches in program appraisal, design, implementation, monitoring and evaluation. In terms of organizational preparedness, building conceptual clarity and operational skills for GESI issues is a common concern for all partners. The management plan will mainstream GESI strategy to engage and empower women and marginalized people in equitable benefit sharing through meaningful participation in participatory biodiversity conservation activities. In order to prioritize the needs and support to be provided, participatory ranking of the users will be done based on their well-being and proximity of the settlement to the national park. The constitution of community forest user group will aid in this ranking. Priority will be given to the users residing in villages that lie off-route of tourism activities.

11.4 Implementation and Mainstreaming Strategy

The Park will adopt biodiversity conservation at landscape approach involving BZ communities in participatory manner. The BZ institutions will be strengthened and institutionalized in participatory planning, implementation and monitoring. The BZ institution will maintain

transparency about their programme to local community including local Government. The Park will continue to work together with Nepal Army to protect the biodiversity adopting innovative technology in patrolling. Pooling the resources to implement the activities with conservation partners will be one of the key strategies followed by implementation in the ground in partnership approach. Similarly, BZ institution will also coordinate with local Government to pool the resources to develop infrastructure in the BZ. The Park will adopt communication strategy to orient legislation related to conservation to local people involving BZ communities and Eco-clubs. The strategy will be taken to involve Universities and Colleges to carry out research and studies in the areas of conservation. The Park will take all possible measures tomaintain Park-People amity. In this regard, relief fund will be delivered in effective manner.

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ANNEXES

Annex 1: List of Mammals Recorded in Makalu Barun National Park and its Buffer Zone

SN	Family	Scientific Name	Common Name	Status			
				NRDB	NP WC	IUCN	CITES
1	Ailuridae	*Ailurus fulgens*	Red Panda	E	P	EN	I
2	Muridae	*Alticola roylei*	Royal's Vole			NT	
3	Muridae	*Alticola strachey*	Khumbu Vole				
4	Bovidae	*Bos grunnies*	Wild Yak	C	P	EN	I
5	Canidae	*Canis aurens*	Golden Jackal	S		LC	III
6	Canidae	*Canis lupus*	Grey Wolf	V	P	LC	I
7	Canidae	*Cuon alpinus*	Wild Dog	V		VU	II
8	Felidae	Felis bengalensis	Leopard cat	V	P	LC	II
9	Felidae	Felis lynx	Lynx	V	P	LC	II
10	Bovidae	*Hemitragus jemlahicus*	Himalayan Tahr	S		VU	
11	Leporidae	*Lepus oiostolus*	Wooly Hare			LC	
12	Cercopithecidae	*Macaca assamensis*	Maccac monkey	V	P	NT	II
13	Cercopithecidae	*Macaca mulatta*	Rhesus Monkey	S		LR/NT	II
14	Manidae	*Manis pentadactyla*	Chinese Pangolin	E	P	CR	I
15	Moschidae	*Moschus chrysogaster*	Musk Deer	E	P	LR/NT	I

16	Moschidae	*Moschus fuscus*	Musk Deer	E	P	LR/NT	II
17	Cervidae	*Muntiacus muntjak*	Barking Deer			LC	
18	Muridae	*Mus musculus*	House Mouse			LC	
19	Mustelidae	*Mustela flavigula*	Yellow-throated Marten	S		LC	III
20	Mustelidae	*Mustela kathiah*	Yellow-bellied Weasel	S		LC	III
21	Mustelidae	*Mustela sibirica*	Siberian Weasel	S		LC	III
22	Bovidae	*Naemorhedus goral*	Goral	S		LR/NT	I
23	Bovidae	*Naemorhedus sumatraensis*	Mainland Serow	S		VU	I
24	Felidae	*Neofelis nebulosa*	Clouded leopard	E	P	VU	I
25	Ochotonidae	*Ochotana macrotis*	Long-eared Pika			LC	
26	Felidae	*Panthera pardus*	Common Leopard	S		LC	I
27	Muridae	*Pitymys sikimensis*	Alpine Vole			LC	
28	Cercopithecidae	*Presbytis entellus*	Langur	S		LR/NT	I
29	Muridae	*Rattus rattus*	House Rat			LC	
30	Felidae	*Uncia uncia*	Snow Leopard	E	P	EN	I
31	Ursidae	*Ursus thibetanus*	Himalayan Black Bear	E		VU	I
32	Canidae	*Vulpes*	Red fox	S		LC	III

		montana	/Mountain Fox				

Status

a) **National Parks and Wildlife Conservation (NPWC) Act, 1973 :** P = Protected

b) **b) Nepal Red Data Book (NRDB) :**

- EXN = Extinct from Nepal,
- C = Critically Endangered,
- E = Endangered,
- V =Vulnerable,
- S = Susceptible,
- I = Introduced,
- ? = Not confirmed,
- End = Endemic species of Nepal

c) **IUCN Red List Category :**

- EX = Extinct,
- EW = Extinct in the Wild,
- CR = Critically Endangered,
- EN = Endangered,
- VU = Vulnerable,
- NT = Near Threatened,
- LC = Least Concern,
- DD = Data Deficient,
- NE = Not Evaluated,
- LR/LC = Lower Risk/ Least Concern,
- LR/NT = Lower Risk/ Near Threatened

d) **d) Convention on International Trade of Endangered Species of Flora and Fauna (CITES) :** Appendix (I, II and III)

Annex 2: List of Birds Recorded in Makalu Barun National Park and its Buffer Zone

S.N.	**GALLIFORMES** **Phasianidae**		
1	Snow Partridge	*Lerwa lerwa*	लरवान
2	Tibetan Snowcock I	*Tetraogallus tibetanus*	कोङ्मा हिउँकुखुरा
3	Black Francolin	*Francolinus francolinus*	कालो तित्रा
4	Hill Partridge	*Arborophila torqueola*	पिउरा
5	Blood Pheasant II	*Ithaginis cruentus*	चिलिमे
6	Satyr Tragopan III #	*Tragopan satyra*	मुनाल
7	Himalayan Monal I #	*Lophophorus impejanus*	डाँफे
8	Red Junglefowl	*Gallus gallus*	लुईचे
9	Kalij Pheasant	*Lophura leucomelanos*	कालिज
10	Rufous-throated Partridge	*Arborophila rufogularis*	लालकण्ठे पिउरा
	PICIFORMES		
	Indicatoridae		
11	Yellow-rumped Honeyguide	*Indicator xanthonotus*	चाकासूचक
	Picidae		
12	Grey-capped Pygmy Woodpecker	*Dendrocopos canicapillus*	फुस्रोटाउके काष्ठकूट
13	Brown-fronted Woodpecker	*Dendrocopos auriceps*	खैरोटाउके काष्ठकूट
14	Fulvous-breasted Woodpecker	*Dendrocopos macei*	काष्ठकूट
15	Crimson-breasted Woodpecker	*Dendrocopos cathpharius*	रातोछाती काष्ठकूट
16	Darjeeling Woodpecker	*Dendrocopos darjellensis*	दार्जीलिङ्ग काष्ठकूज्जद्
17	Rufous Woodpecker	*Celeus brachyurus*	सानो तामे लाहाँचे
18	Rufous-bellied Woodpecker	*Dendrocopos hyperythrus*	कैलोछाती काष्ठकूट
19	Lesser Yellownape	*Picus chlorolophus*	सुनजुरे काठफोर
20	Greater Yellownape	*Picus flavinucha*	ठूलो सुनजुरे काठफोर
21	Grey-headed Woodpecker	*Picus canus*	कालोगर्दने काठफोर
22	Himalayan Flameback	*Dinopium shorii*	तीनऔंले लाहाँचे
23	Greater Flameback	*Chrysocolaptes lucidus*	गर्दनथोप्ले लाहाँचे
24	Bay Woodpecker	*Blythipicus pyrrhotis*	तामे लाहाँचे
25	Speckled Piculet	*Picumnus innominatus*	थोप्ले ससिया
	Megalaimidae		

26	Great Barbet	*Megalaima virens*	न्याउली
27	Golden-throated Barbet	*Megalaima franklinii*	कुक्लुङ्ग
28	Blue-throated Barbet	*Megalaima asiatica*	कुथुर्के
	UPUPIFORMES		
	Upupidae		
29	Common Hoopoe	*Upupa epops*	फाप्रे चरा
	CORACIIFORMES		
	Coraciidae		
30	Indian Roller	*Coracias benghalensis*	ठेउवा
	Alcedinidae		
31	Common Kingfisher	*Alcedo atthis*	सानो माटीकोरे
	Dacelonidae		
32	White-throated Kingfisher	*Halcyon smyrnensis*	सेतोकण्ठे माटीकोरे
	Cerylidae		
33	Crested Kingfisher	*Megaceryle lugubris*	ठूलो छिरबिरे माटीकोरे
	CUCULIFORMES		
	Cuculidae		
34	Pied Cuckoo	*Clamator jacobinus*	जुरे कोइली
35	Large Hawk Cuckoo	*Hierococcyx sparverioides*	पहाडी बीउ कुहियो
36	Common Hawk Cuckoo	*Hierococcyx varius*	बीउ कुहियो
37	Indian Cuckoo	*Cuculus micropterus*	काफल पाक्यो
38	Eurasian Cuckoo	*Cuculus canorus*	कुक्कु कोइली
39	Oriental Cuckoo	*Cuculus saturatus*	पूर्वीय कोइली
40	Lesser Cuckoo	*Cuculus poliocephalus*	सानो कोइली
41	Grey-bellied Cuckoo	*Cacomantis passerinus*	फुस्रो सानो कोइली
42	Asian Emerald Cuckoo	*Chrysococcyx maculatus*	हरित कोइली
43	Drongo Cuckoo	*Surniculus lugubris*	चिबे कोइली
44	Asian Koel	*Eudynamys scolopacea*	कोइली
	PSITTACIFORMES		
	Psittacidae		
45	Slaty-headed Parakeet II	*Psittacula himalayana*	मदना सुगा

	APODIFORMES		
	Apodidae		
46	Himalayan Swiftlet	*Collocalia brevirostris*	चींचिका गौंथली
47	Alpine Swift	*Tachymarptis melba*	बतासी गौंथली
48	Fork-tailed Swift	*Apus pacificus*	पुच्छरकापे गौंथली
49	House Swift	*Apus affinis*	फिरफिरे घरगौंथली
50	White-throated Needletail	*Hirundapus caudacutus*	सेतोकण्ठे गौंथली
	Strigidae		
51	Mountain Scops Owl II	*Otus spilocephalus*	लेकाली उलूक
52	Spot-bellied Eagle Owl II	*Bubo nipalensis*	महाकौशिक
53	Brown Wood Owl II	*Strix leptogrammica*	चश्मे उलूक
54	Tawny Owl II	*Strix aluco*	कैलो पहाडी उलूक
55	Collared Owlet II	*Glaucidium brodiei*	सानो डुन्डुल
56	Asian Barred Owlet II	*Glaucidium cuculoides*	ठूलो डुन्डुल
57	Little Owl II	*Athene noctua*	हिमाली कोचलगाँडे
58	Brown Hawk-Owl II	*Ninox scutulata*	कालपेचक
59	Jungle Owlet II	*Glaucidium radiatum*	डुन्डुल
60	Collared Scops Owl II	*Otus bakkamoena*	चित्री उलूक
	Caprimulgidae		
61	Grey Nightjar	*Caprimulgus indicus*	फुस्रो चैतेचरा
	COLUMBIFORMES		
	Columbidae		
62	Snow Pigeon	*Columba leuconota*	हिमाली मलेवा
63	Speckled Wood Pigeon	*Columba hodgsonii*	छिरबिरे वनपरेवा
64	Ashy Wood Pigeon	*Columba pulchricollis*	फुस्रो वनपरेवा
65	Oriental Turtle Dove	*Streptopelia orientalis*	तामे ढुकुर
66	Spotted Dove	*Streptopelia chinensis*	कुले ढुकुर
67	Emerald Dove	*Chalcophaps indica*	हारील ढुकुर
68	Wedge-tailed Green Pigeon	*Treron sphenura*	पहाडी हलेसो
	CICONIIFORMES		
	Scolopacidae		
69	Eurasian Woodcock	*Scolopax rusticola*	ठूलो चाहा

70	Solitary Snipe	*Gallinago solitaria*	भार्का चाहा
71	Wood Snipe *	*Gallinago nemoricola*	वन चाहा
72	Pintail Snipe	*Gallinago stenura*	भारक चाहा
73	Green Sandpiper	*Tringa ochropus*	रुख सुङ्सुङिया
	Charadriidae		
74	River Lapwing	*Vanellus duvaucelii*	खोले हुटिट्याउ
	Accipitridae		
75	Oriental Honey-buzzard	*Pernis ptilorhyncus*	मधुहा
76	Black Kite II	*Milvus migrans*	कालो चील
77	Lammergeier II	*Gypaetus barbatus*	हाडफोर
78	Himalayan Griffon II	*Gyps himalayensis*	हिमाली गिद्ध
79	Eurasian Griffon II	*Gyps fulvus*	खैरो गिद्ध
80	Crested Serpent Eagle II	*Spilornis cheela*	काकाकुल
81	Hen Harrier II	*Circus cyaneus*	चल्लाचोर भुइँचील
82	Pied Harrier II	*Circus melanoleucos*	आब्लाक पेटाहा भुइँचील
83	Crested Goshawk II	*Accipiter trivirgatus*	कल्की बसेरा
84	Besra II	*Accipiter virgatus*	बेसरा
85	Eurasian Sparrowhawk II	*Accipiter nisus*	वनबाज
86	Northern Goshawk II	*Accipiter gentilis*	बलाकांक्ष वनबाज
87	Long-legged Buzzard II	*Buteo rufinus*	लामखुट्टे श्येनबाज
88	Upland Buzzard II	*Buteo hemilasius*	पहाडी श्येनबाज
89	Common Buzzard II	*Buteo buteo*	श्येनबाज
90	Black Eagle II	*Ictinaetus malayensis*	द्रोणक चील
91	Steppe Eagle II *	*Aquila nipalensis*	गोमायु महाचील
92	Imperial Eagle * I	*Aquila heliaca*	रणमत्त महाचील
93	Golden Eagle II	*Aquila chrysaetos*	सुपर्ण महाचील
94	Mountain Hawk Eagle II	*Spizaetus nipalensis*	पहाडी शदलचील
	Falconidae		
95	Common Kestrel II	*Falco tinnunculus*	बौंडाइ
96	Red-necked Falcon II	*Falco chicquera*	रातोटाउके बौंडाइ
97	Merlin II	*Falco columbarius*	सानो बाज
98	Eurasian Hobby II	*Falco subbuteo*	जुंगे चिरान्तक बाज
99	Peregrine Falcon I	*Falco peregrinus*	शाही बाज
	Phalacrocoracidae		
100	Great Cormorant	*Phalacrocorax carbo*	जलेवा

	Ardeidae		
101	Cattle Egret	*Bubulcus ibis*	वस्तु बकुल्ला
	Ciconiidae		
102	Black Stork II #	*Ciconia nigra*	कालो गरुड
103	Woolly-necked Stork *	*Ciconia episcopus*	लोभीपापी गरुड
	PASSERIFORMES		
	Eurylaimidae		
104	Long-tailed Broadbill	*Psarisomus dalhousiae*	चित्रकुट
	Irenidae		
105	Orange-bellied Leafbird	*Chloropsis hardwickii*	स्वर्णोदर हरितचरी
	Laniidae		
106	Long-tailed Shrike	*Lanius schach*	भद्राई
107	Grey-backed Shrike	*Lanius tephronotus*	हिमाली भद्राई
	Corvidae		
108	Yellow-billed Blue Magpie	*Urocissa flavirostris*	सुनठूँडे लामपुच्छ्रे
109	Red-billed Blue Magpie	*Urocissa erythrorhyncha*	स्यालपोथरी लामपुच्छ्रे
110	Common Green Magpie	*Cissa chinensis*	हरियो लामपुच्छ्रे
111	Grey Treepie	*Dendrocitta formosae*	पहाडी कोकले
112	Spotted Nutcracker	*Nucifraga caryocatactes*	वनसर्रा
113	Red-billed Chough	*Pyrrhocorax pyrrhocorax*	टुङ्गा
114	Yellow-billed Chough	*Pyrrhocorax graculus*	टेमु
115	Large-billed Crow	*Corvus macrorhynchos*	कालो काग
116	Common Raven	*Corvus corax*	राजा काग
117	Maroon Oriole	*Oriolus traillii*	घनरक्त सुनचरी
118	Large Cuckooshrike	*Coracina macei*	लटुशक विरहीचरी
119	Black-winged Cuckooshrike	*Coracina melaschistos*	कालो विरहीचरी
120	Long-tailed Minivet	*Pericrocotus ethologus*	लामपुछ्रे रानीचरी
121	Short-billed Minivet	*Pericrocotus brevirostris*	लघुठूँडे रानीचरी
122	Scarlet Minivet	*Pericrocotus flammeus*	रानीचरी
123	Bar-winged Flycatcher-shrike	*Hemipus picatus*	आसकोटे चरी
124	Yellow-bellied Fantail	*Rhipidura hypoxantha*	पहेंलो मारुनीचरी
125	White-throated Fantail	*Rhipidura albicollis*	नक्कले मारुनीचरी
126	Black Drongo	*Dicrurus macrocercus*	कालो चिबे
127	Ashy Drongo	*Dicrurus leucophaeus*	ध्वाँसे चिबे

128	Bronzed Drongo	*Dicrurus aeneus*	सानो चिबे
129	Lesser Racket-tailed Drongo	*Dicrurus remifer*	भृङ्गराज चिबे
130	Spangled Drongo	*Dicrurus hottentottus*	केशराज चिबे
	Cinclidae		
131	White-throated Dipper	*Cinclus cinclus*	सेतोकण्ठे वञ्जूल
132	Brown Dipper	*Cinclus pallasii*	खैरो वञ्जूल
	Muscicapidae		
133	Blue-capped Rock Thrush	*Monticola cinclorhynchus*	सानो हजारा चाँचर
134	Chestnut-bellied Rock Thrush	*Monticola rufiventris*	हजारा चाँचर
135	Blue Rock Thrush	*Monticola solitarius*	उमा चाँचर
136	Blue Whistling Thrush	*Myophonus caeruleus*	कल्चौंडे
137	Pied Thrush	*Zoothera wardii*	कस्तूरा चाँचर
138	Plain-backed Thrush	*Zoothera mollissima*	सादाढाडे चाँचर
139	Long-tailed Thrush	*Zoothera dixoni*	लामपुच्छे चाँचर
140	Scaly Thrush	*Zoothera dauma*	गोब्रे चाँचर
141	Long-billed Thrush	*Zoothera monticola*	लामोठूँडे चाँचर
142	Dark-sided Thrush	*Zoothera marginata*	लामोठूँडे सानो चाँचर
143	Tickell's Thrush	*Turdus unicolor*	फुस्रे चाँचर
144	White-collared Blackbird	*Turdus albocinctus*	कण्ठे चाँचर
145	Grey-winged Blackbird	*Turdus boulboul*	मदना चाँचर
146	Eurasian Blackbird	*Turdus merula*	कालो चाँचर
147	Chestnut Thrush	*Turdus rubrocanus*	कैले चाँचर
148	Dark-throated Thrush	*Turdus ruficollis*	कालोकण्ठे चाँचर
149	White-browed Shortwing	*Brachypteryx montana*	नीलो लघुपंख
150	Gould's Shortwing	*Brachypteryx stellata*	
151	Dark-sided Flycatcher	*Muscicapa sibirica*	ध्वाँसे अर्जुनक
152	Asian Brown Flycatcher	*Muscicapa dauurica*	धूसर अर्जुनक
153	Ferruginous Flycatcher	*Muscicapa ferruginea*	कैलो अर्जुनक
154	Slaty-backed Flycatcher	*Ficedula hodgsonii*	नीलढाडे अर्जुनक
155	Rufous-gorgeted Flycatcher	*Ficedula strophiata*	सेतोटिके अर्जुनक
156	White-gorgeted Flycatcher	*Ficedula monileger*	सेतोकण्ठे अर्जुनक
157	Snowy-browed Flycatcher	*Ficedula hyperythra*	सेतोआँखीभौं अर्जुनक
158	Little Pied Flycatcher	*Ficedula westermanni*	श्यामश्वेत अर्जुनक
159	Ultramarine Flycatcher	*Ficedula superciliaris*	नीलश्वेत अर्जुनक
160	Slaty-blue Flycatcher	*Ficedula tricolor*	टिकटिके अर्जुनक

161	Sapphire Flycatcher	*Ficedula sapphira*	नीलमणि अर्जुनक
162	Verditer Flycatcher	*Eumyias thalassina*	नीलतुथो अर्जुनक
163	Pale Blue Flycatcher	*Cyornis unicolor*	नीलगगन अर्जुनक
164	Large Niltava	*Niltava grandis*	ठूलो नीलतभा
165	Small Niltava	*Niltava macgrigoriae*	सानो नीलतभा
166	Rufous-bellied Niltava	*Niltava sundara*	सुन्दर नीलतभा
167	Blue-throated Flycatcher	*Cyornis rubeculoides*	नीलकण्ठे अर्जुनक
168	Hill Blue Flycatcher	*Cyornis banyumas*	पहाडी नीलो अर्जुनक
169	Pygmy Blue Flycatcher	*Muscicapella hodgsoni*	
170	Grey-headed Canary Flycatcher	*Culicicapa ceylonensis*	चञ्चले अर्जुनक
171	White-tailed Rubythroat	*Luscinia pectoralis*	हिमाली रातोकण्ड
172	Indian Blue Robin	*Luscinia brunnea*	नीलो रबिन
173	Orange-flanked Bush Robin	*Tarsiger cyanurus*	सुन्तलाकोखे रबिन
174	Golden Bush Robin	*Tarsiger chrysaeus*	सुनौलो रबिन
175	White-browed Bush Robin	*Tarsiger indicus*	सेतोआँखीभौं रबिन
176	Rufous-breasted Bush Robin	*Tarsiger hyperythrus*	कैलेछाती रबिन
177	Oriental Magpie Robin	*Copsychus saularis*	धोबिनी चरा
178	Blue-capped Redstart	*Phoenicurus coeruleocephalus*	धोबिनी खञ्जरी
179	Black Redstart	*Phoenicurus ochruros*	ध्याप्ची खञ्जरी
180	Hodgson's Redstart	*Phoenicurus hodgsoni*	तनकम्प खञ्जरी
181	White-throated Redstart	*Phoenicurus schisticeps*	सेतोकण्ठे खञ्जरी
182	White-winged Redstart	*Phoenicurus erythrogaster*	सेतोपंखे खञ्जरी
183	Blue-fronted Redstart	*Phoenicurus frontalis*	नीलटाउके खञ्जरी
184	White-capped Water Redstart	*Chaimarrornis leucocephalus*	सेतोटाउके जलखञ्जरी
185	Plumbeous Water Redstart	*Rhyacornis fuliginosus*	नीलाम्बर जलखञ्जरी
186	White-bellied Redstart	*Hodgsonius phaenicuroides*	सेतोपेटे खञ्जरी
187	White-tailed Robin	*Myiomela leucura*	सेतोपुच्छे रबिन
188	Grandala	*Grandala coelicolor*	हिमाली ग्राण्डला
189	Little Forktail	*Enicurus scouleri*	गंगा खोलेधोबिनी
190	Slaty-backed Forktail	*Enicurus schistaceus*	फुस्रोढाडे खोलेधोबिनी
191	Spotted Forktail	*Enicurus maculatus*	थोप्ले खोलेधोबिनी
192	Purple Cochoa	*Cochoa purpurea*	बैजनी कचोवा
193	Common Stonechat	*Saxicola torquata*	झेकझेक झ्याप्सी

194	Pied Bushchat	*Saxicola caprata*	काले झ्याप्सी
195	Grey Bushchat	*Saxicola ferrea*	हिमाली झ्याप्सी
	Sturnidae		
196	Chestnut-tailed Starling	*Sturnus malabaricus*	फुस्रोटाउके सारौं
197	Common Myna	*Acridotheres tristis*	डाङ्ग्रे रुपी
	Sittidae		
198	Chestnut-bellied Nuthatch	*Sitta castanea*	कटुसे मट्टा
199	White-tailed Nuthatch	*Sitta himalayensis*	पहाडी मट्टा
200	Wallcreeper	*Tichodroma muraria*	मुरारी पुतलीचरा
	Certhiidae		
201	Eurasian Tree-creeper	*Certhia familiaris*	सेतोपेटे छेपारेचरी
202	Rusty-flanked Tree-creeper	*Certhia nipalensis*	कैलोकोखे छेपारेचरी
203	Brown-throated Tree-creeper	*Certhia discolor*	खैरो छेपारेचरी
204	Winter Wren	*Troglodytes troglodytes*	चित्री
	Paridae		
205	Rufous-vented Tit	*Parus rubidiventris*	सेतोगर्दने चिचिल्कोटे
206	Coal Tit	*Parus ater*	सानो फुस्रे चिचिल्कोटे
207	Grey-crested Tit	*Parus dichrous*	फुस्रोजुरे चिचिल्कोटे
208	Great Tit	*Parus major*	चिचिल्कोटे
209	Green-backed Tit	*Parus monticolus*	हरियो चिचिल्कोटे
210	Black-lored Tit	*Parus xanthogenys*	पाण्डु चिचिल्कोटे
211	Yellow-cheeked Tit	*Parus spilonotus*	पीतमुहार चिचिल्कोटे
212	Yellow-browed Tit	*Sylviparus modestus*	चँदुवा चिचिल्कोटे
213	Sultan Tit	*Melanochlora sultanea*	स्वर्णचूल राजचिचिल्कोटे
	Aegithalidae		
214	Black-throated Tit	*Aegithalos concinnus*	कालीकण्ठे राजचिचिल्कोटे
215	Rufous-fronted Tit	*Aegithalos iouschistos*	कैलोपेटे राजचिचिल्कोटे
	Hirundinidae		
216	Eurasian Crag Martin	*Hirundo rupestris*	नहिकुटी गौंथली
217	Barn Swallow	*Hirundo rustica*	घर गौंथली
218	Red-rumped Swallow	*Hirundo daurica*	गेरुकटी गौंथली
219	Northern House Martin	*Delichon urbica*	भीरगौंथली
220	Asian House Martin	*Delichon dasypus*	एशियाली भीरगौंथली
221	Nepal House Martin	*Delichon nipalensis*	नेपाल भीरगौंथली

	Pycnonotidae		
222	Striated Bulbul	*Pycnonotus striatus*	धर्के जुरेली
223	Himalayan Bulbul	*Pycnonotus leucogenys*	जुल्फे जुरेली
224	Red-vented Bulbul	*Pycnonotus cafer*	जुरेली
225	Ashy Bulbul	*Hemixos flavala*	फुस्रोपेटे जुरेली
226	Mountain Bulbul	*Hypsipetes mcclellandii*	कैलोपेटे जुरेली
227	Black Bulbul	*Hypsipetes leucocephalus*	बाखे जुरेली
	Cisticolidae		
228	Striated Prinia	*Prinia criniger*	सुया घाँसेफिस्टो
229	Hill Prinia	*Prinia atrogularis*	कालीकण्ठे घाँसेफिस्टो
230	Grey breasted Prinia	*Prinia hodgsonii*	
	Zosteropidae		
231	Oriental White-eye	*Zosterops palpebrosus*	कांकीर
	Sylviidae		
232	Chestnut-headed Tesia	*Tesia castaneocoronata*	रातोटाउके टिसिया
233	Slaty-bellied Tesia	*Tesia olivea*	पीतहरित टिसिया
234	Grey-bellied Tesia	*Tesia cyaniventer*	फुस्रोपेटे टिसिया
235	Brownish-flanked Bush Warbler	*Cettia fortipes*	खैरोकोखे झाडीफिस्टो
236	Chestnut-crowned Bush Warbler	*Cettia major*	ठूलो रातोटाउके झाडीफिस्टो
237	Western Crowned Warbler	*Phylloscopus occipitalis*	ठूलो तालुधर्के फिस्टो
238	Aberrant Bush Warbler	*Cettia flavolivacea*	पीतहरित झाडीफिस्टो
239	Grey-sided Bush Warbler	*Cettia brunnifrons*	रातोटाउके झाडीफिस्टो
240	Common Tailorbird	*Orthotomus sutorius*	पातसिउने फिस्टो
241	Smoky Warbler	*Phylloscopus fuligiventer*	धुवाँसे फिस्टो
242	Tickell's Leaf Warbler	*Phylloscopus affinis*	पीतोदर फिस्टो
243	Buff-barred Warbler	*Phylloscopus pulcher*	सुन्तलेरेखी फिस्टो
244	Ashy-throated Warbler	*Phylloscopus maculipennis*	फुस्रोकण्ठे फिस्टो
245	Lemon-rumped Warbler	*Phylloscopus chloronotus*	पीतकटी फिस्टो
246	Yellow-browed Warbler	*Phylloscopus inornatus*	हरित फिस्टो
247	Greenish Warbler	*Phylloscopus trochiloides*	जीवल फिस्टो
248	Large-billed Leaf Warbler	*Phylloscopus magnirostris*	ठूलोठुँडे फिस्टो
249	Blyth's Leaf Warbler	*Phylloscopus reguloides*	तालुधर्के फिस्टो
250	Yellow-vented Warbler	*Phylloscopus cantator*	पीतनिर्गम फिस्टो
251	Golden-spectacled Warbler	*Seicercus burkii*	सुनचश्मे फिस्टो

252	Grey-hooded Warbler	*Seicercus xanthoschistos*	तुमुलकारी फिस्टो
253	Grey-cheeked Warbler	*Seicercus poliogenys*	सेतोचश्मे फिस्टो
254	Chestnut-crowned Warbler	*Seicercus castaniceps*	रातोटाउके फिस्टो
255	Broad-billed Warbler	*Tickellia hodgsoni*	कटुसटाउके फिस्टो
256	Black-faced Warbler	*Abroscopus schisticeps*	गाजले फिस्टो
257	Yellow-bellied Warbler	*Abroscopus superciliaris*	पहेंलोपेटे फिस्टो
258	White-throated Laughingthrush	*Garrulax albogularis*	सोइरने तोरीगाँडा
259	White-crested Laughingthrush	*Garrulax leucolophus*	हिउँजुरे तोरीगाँडा
260	Striated Laughingthrush	*Garrulax striatus*	कल्की तोरीगाँडा
261	Spotted Laughingthrush	*Garrulax ocellatus*	मुँदाले तोरीगाँडा
262	Grey-sided Laughingthrush	*Garrulax caerulatus*	फुस्रोकोखे तोरीगाँडा
263	Streaked Laughingthrush	*Garrulax lineatus*	छिर्के तोरीगाँडा
264	Blue-winged Laughingthrush	*Garrulax squamatus*	नीलपंखे तोरीगाँडा
265	Scaly Laughingthrush	*Garrulax subunicolor*	कत्ले तोरीगाँडा
266	Black-faced Laughingthrush	*Garrulax affinis*	कानटाटे तोरीगाँडा
267	Chestnut-crowned Laughingthrush	*Garrulax erythrocephalus*	कटुसटाउके तोरीगाँडा
268	Puff-throated Babbler	*Pellorneum ruficeps*	थोप्ले भ्याकुर
269	Rusty-cheeked Scimitar Babbler	*Pomatorhinus erythrogenys*	पाल्कोटे
270	Streak-breasted Scimitar Babbler	*Pomatorhinus ruficollis*	छातीधर्से पाल्कोटे
271	Coral-billed Scimitar Babbler	*Pomatorhinus ferruginosus*	मुगाठुँडे पाल्कोटे
272	Slender-billed Scimitar Babbler	*Xiphirhynchus superciliaris*	लामोठूँडे पाल्कोटे
273	Scaly-breasted Wren Babbler	*Pnoepyga albiventer*	कत्ले डिकुरेभ्याकुर
274	Nepal Wren Babbler	*Pnoepyga immaculata*	नृपाल डिकुरेभ्याकुर
275	Pygmy Wren Babbler	*Pnoepyga pusilla*	मुरालिँडे डिकुरेभ्याकुर
276	Rufous-throated Wren Babbler	*Spelaeornis caudatus*	कैलोकण्ठे डिकुरेभ्याकुर
277	Spotted Wren Babbler	*Spelaeornis formosus*	थोप्ले डिकुरेभ्याकुर
278	Rufous-capped Babbler	*Stachyris ruficeps*	रातोटाउके वनभ्याकुर
279	Black-chinned Babbler	*Stachyris pyrrhops*	कालोचिउँडे वनभ्याकुर
280	Golden Babbler	*Stachyris chrysaea*	निगाले वनभ्याकुर
281	Grey-throated Babbler	*Stachyris nigriceps*	फुस्रोकण्ठे वनभ्याकुर
282	Spiny Babbler	*Turdoides nipalensis*	काँडे भ्याकुर
283	Red-billed Leiothrix II	*Leiothrix lutea*	रोचिष्णु मिसिया
284	Black-headed Shrike Babbler	*Pteruthius rufiventer*	कालोटाउके भद्राईभ्याकुर
285	White-browed Shrike Babbler	*Pteruthius flaviscapis*	लालपंखे भद्राईभ्याकुर

286	Green Shrike Babbler	*Pteruthius xanthochlorus*	हरित भद्राईभ्याकुर
287	Black-eared Shrike Babbler	*Pteruthius melanotis*	गाजले भद्राईभ्याकुर
288	White-browed Scimitar Babbler	*Pomatorhinus schisticeps*	फुस्रोटाउके पाल्कोटे
289	Rusty-fronted Barwing	*Actinodura egertoni*	कैलोतालु वनचाहर
290	Hoary-throated Barwing	*Actinodura nipalensis*	वनचाहर
291	Blue-winged Minla	*Minla cyanouroptera*	नीलपंख मिन्ला
292	Chestnut-tailed Minla	*Minla strigula*	शिव मिन्ला
293	Red-tailed Minla	*Minla ignotincta*	लालपुच्छे
294	Golden-breasted Fulvetta	*Alcippe chrysotis*	स्वर्णवक्ष फूलबुट्टा
295	Rufous-winged Fulvetta	*Alcippe castaneceps*	कटुसटाउके फूलबुट्टा
296	White-browed Fulvetta	*Alcippe vinipectus*	पीतनयन फूलबुट्टा
297	Nepal Fulvetta	*Alcippe nipalensis*	नेपाल फूलबुट्टा
298	Rufous-backed Sibia	*Heterophasia annectans*	सानो सिबिया
299	Rufous Sibia	*Heterophasia capistrata*	सिबिया
300	White-naped Yuhina	*Yuhina bakeri*	सेतोकाने जुरेचरा
301	Whiskered Yuhina	*Yuhina flavicollis*	जुंगे जुरेचरा
302	Stripe-throated Yuhina	*Yuhina gularis*	थुपलकल्की जुरेचरा
303	Rufous-vented Yuhina	*Yuhina occipitalis*	खैरो जुरेचरा
304	Black-chinned Yuhina	*Yuhina nigrimenta*	कालोकल्की जुरेचरा
305	White-bellied Yuhina	*Yuhina zantholeuca*	सेतोपेटे जुरेचरा
306	Fire-tailed Myzornis	*Myzornis pyrrhoura*	हरित हिमसुधा
307	Great Parrotbill	*Conostoma oemodium*	चाँदे बाँदरचरी
308	Brown Parrotbill	*Paradoxornis unicolor*	खैरो बाँदरचरी
309	Fulvous Parrotbill	*Paradoxornis fulvifrons*	निगाले बाँदरीचरी
310	Black-throated Parrotbill	*Paradoxornis nipalensis*	नेपाल बाँदरचरी
	Alaudidae		
311	Greater Short-toed Lark	*Calandrella brachydactyla*	वर्तिका भारद्धाज
312	Hume's Short-toed Lark	*Calandrella acutirostris*	पहेलोठूँडे भारद्धाज
313	Oriental Skylark	*Alauda gulgula*	ब्राह्मीचटी
314	Horned Lark	*Eremophila alpestris*	जुंगे भारद्धाज
	Nectariniidae		
315	Yellow-bellied Flowerpecker	*Dicaeum melanoxanthum*	पीतोदर पुष्पकोकिल
316	Pale-billed Flowerpecker	*Dicaeum erythrorynchos*	रातोठूँडे पुष्पकोकिल
317	Fire-breasted Flowerpecker	*Dicaeum ignipectus*	अग्निवक्ष पुष्पकोकिल
318	Mrs Gould's Sunbird	*Aethopyga gouldiae*	कान्ति बेङ्गेचरा

319	Green-tailed Sunbird	*Aethopyga nipalensis*	नेपाल बेङ्गेचरा
320	Black-throated Sunbird	*Aethopyga saturata*	कालीकण्ठ् बुङ्गेचरा
321	Crimson Sunbird	*Aethopyga siparaja*	सिपराजा बुङ्गेचरा
322	Fire-tailed Sunbird	*Aethopyga ignicauda*	लामपुच्छे बुङ्गेचरा
	Passeridae		
323	Eurasian Tree Sparrow	*Passer montanus*	रुख भँगेरा
324	Goldcrest	*Regulus regulus*	
325	Cinnamon Sparrow	*Peucaea sumichrasti*	
326	Tibetan Snowfinch	*Montifringilla adamsi*	
327	White Wagtail	*Motacilla alba*	सेतो टिकटिके
328	White-browed Wagtail	*Motacilla maderaspatensis*	खोले टिकटिके
329	Citrine Wagtail	*Motacilla citreola*	बेसारे टिकटिके
330	Grey Wagtail	*Motacilla cinerea*	फुस्रो टिकटिके
331	Blyth's Pipit	*Anthus godlewskii*	छोटोठूँडे चुइयाँ
332	Olive-backed Pipit	*Anthus hodgsoni*	रुख चुइयाँ
333	Rosy Pipit	*Anthus roseatus*	गुलाफीकण्ठे चुइयाँ
334	Upland Pipit	*Anthus sylvanus*	पहाडी चुइयाँ
335	Alpine Accentor	*Prunella collaris*	हिमाली लेकचरी
336	Altai Accentor	*Prunella himalayana*	अल्ताई लेकचरी
337	Robin Accentor	*Prunella rubeculoides*	रबिन लेकचरी
338	Rufous-breasted Accentor	*Prunella strophiata*	मुसे लेकचरी
339	Maroon-backed Accentor	*Prunella immaculata*	पाण्डुनयनी लेकचरी
340	White-rumped Munia	*Lonchura striata*	सेतोढाडे मुनियाँ
	Fringillidae		
341	Chaffinch	*Fringilla coelebs*	चित्रकचरी
342	Brambling	*Fringilla montifringilla*	कालोटाउके चित्रकचरी
343	Collared Grosbeak	*Mycerobas affinis*	सुन्तलेगदैन महाँठूँड
344	Yellow-breasted Greenfinch	*Carduelis spinoides*	गाजले पीतचरी
345	Tibetan Siskin	*Carduelis thibetana*	भोट सिस्कीन
346	Twite	*Carduelis flavirostris*	सानेठूँडे लिनेट
347	Plain Mountain Finch	*Leucosticte nemoricola*	तितुभँगेरा
348	Brandt's Mountain Finch	*Leucosticte brandti*	ध्वाँसे टाउके तितुभँगेरा
349	Dark-breasted Rosefinch	*Carpodacus nipalensis*	नेपाल तितु
350	Common Rosefinch	*Carpodacus erythrinus*	अमोंगा तितु
351	Beautiful Rosefinch	*Carpodacus pulcherrimus*	झिंबी तितु

352	Pink-browed Rosefinch	*Carpodacus rodochrous*	रातो झिंबी तितु
353	Spot-winged Rosefinch	*Carpodacus rodopeplus*	पंखथोप्ले तितु
354	White-browed Rosefinch	*Carpodacus thura*	पंखथोप्ले ठूलोतितु
355	Streaked Rosefinch	*Carpodacus rubicilloides*	धर्के राजतितु
356	Great Rosefinch	*Carpodacus rubicilla*	राजतितु
357	Red-fronted Rosefinch	*Carpodacus puniceus*	रक्तशीर्ष राजतितु
358	Dark-rumped Rosefinch	*Carpodacus edwardsii*	कुमधर्के तितु
359	Crimson-browed Finch	*Pinicola subhimachalus*	सिम्रिक राजतितु
360	Scarlet Finch	*Haematospiza sipahi*	सिपाही तितु
361	Brown Bullfinch	*Pyrrhula nipalensis*	खैरो टिउँटिउँ
362	Red-headed Bullfinch	*Pyrrhula erythrocephala*	रातोटोउके टिउँटिउँ
363	Spot-winged Grosbeak	*Mycerobas melanozanthos*	पंखथोप्ले महाँठूँड
364	White-winged Grosbeak	*Mycerobas carnipes*	धूपी महाँठूँड
365	Gold-naped Finch	*Pyrrhoplectes epauletta*	सुन्तलेटाउके कालोतितु
366	Crested Bunting	*Melophus lathami*	जुरे बगेडी
367	Little Bunting	*Emberiza pusilla*	लघु बगेडी
	Key to the codes:		
	* Globally threatened		
	# Nationally threatened		
	I CITES Appendix one		
	II CITES Appendix two		
	III CITES Appendix three		

Annex 3: List of Plants found in Lakes and Catchments of Panchpokhari, MBNP.

SN	Name	Family	Common Name	Lake	Catchment	CAMP 2001	CITES 1973	IUCN 1994
1	*Aconitum spicatum*	Ranunculaceae	Bikh	√	√	+		*VU*
2	*Anaphalis contorta*	Asteraceae	Pansan	√	√			
3	*Androsace lehmannii*	Primulaceae	N/A	√				
4	*Bergenia ciliata*	Saxifragaceae	Pakhenved	√	√			CT
5	*Bistorta affinis*	Polygonaceae	N/A	√	√			
6	*Bistorta amplexicaulis*	Polygonaceae	Raktrayaulo	√	√			
7	*Carex himalaica**	Cyperaceae	N/A		√			
8	*Cassiope fastigiata*	Ericaceae	Phursan	√				
9	*Corydalis spp*	Papaveraceae	N/A		√			
10	*Ephedra gerardiana*	Gnetaceae	Somlata	√	√	+		
11	*Fritillaria chirsosa*	Liliaceae	Kakoli		√	+		
12	*Impatiens spp*	Balsaminaceae	N/A	√	√			
13	*Juniperus recurva*	Cupressaceae	Dhupi	√	√			
14	*Juncus himalensis*	Juncaceae	N/A	√	√			
15	*Meconpsis paniculata*	Papaveraceae	Kyashar		√		+	
16	*Parnassia spp*	Parnassiaceae	N/A	√	√			
17	*Pedicularis scullyana*	Scrophulariaceae	N/A	√	√			

18	*Pedicularis spp*	Scrophulariaceae	N/A	√	√			
19	*Poa species*	Poaceae	N/A	√	√			
20	*Potentialla spp*	Rosaceae	N/A	√	√			
21	*Potentilla coriandrifolia*	Rosaceae	N/A	√	√			
22	*Potentilla microphylla*	Rosaceae	N/A	√				
23	*Potentilla peduncularis*	Rosaceae	N/A		√			
24	*Primula atsadentata*	Primulaceae	N/A	√	√			
25	*Primula prupurea*	Primulaceae	N/A	√	√			
26	*Rananculus himalaicus**	Ranunculaceae	N/A	√	√			
27	*Rheum australe*	Polygonaceae	Padamchal	√	√	+		
28	*Rhododendron anthopogan*	Ericaceae	Sunpati	√	√			
29	*Rhododendron lepidotum*	Ericaceae	Bhale sunpati	√	√			
30	*Senecio spp*	Asteraceae	Marcha		√			
31	*unidenfied 1*	Asteraceae	N/A		√			
32	*unidenfied 2*		N/A	√	√			

*Endemic. (*Source :DNPWC & WWF 2009)*

Annex 4: Existing Park and Security Posts in Makalu Barun National Park and its Buffer Zone

SN	Post Name	Latitude	Longitude	District	Park/ BZ	Remarks
1	Seduwa	27.586642°	87.269425°	Sankhuwasabha	BZ	Headquarter/ Sector Office
2	Army Headqurters	27.590092°	87.313533°	Sankhuwasabha	BZ	Army HQ
3	Hedangna Gadhi Check Post	27.567186°	87.307492°	Sankhuwasabha	BZ	Check Post
4	Bung Sector Office	27.512567°	86.830697°	Solukhumbu	BZ	Sector Office
5	Bung Quarter	27.515472°	86.831367°	Solukhumbu	BZ	Others
6	Kothe Check Post	27.664108°	86.814267°	Solukhumbu	Park	Check Post
7	Tamku Sector Office	27.486503°	87.103411°	Sankhuwasabha	BZ	Sector Office / Army Post
8	Sisuwatar Check Post	27.474753°	87.081342°	Sankhuwasabha	BZ	Check Post
9	Hattiya Sector Office	27.733489°	87.340436°	Sankhuwasabha	BZ	Sector Office
10	Gola Check Post	27.661347°	87.355306°	Sankhuwasabha	BZ	Check Post
11	Kimathanka Check Post	27.850039°	87.415036°	Sankhuwasabha	BZ	Check Post
12	Yangsima post			Sankhuwasabha	BZ	Check Post
13	Pukhuwa dovan post			Sankhuwasabha	BZ	Check Post

14	Chheskam Range post			Solukhumbu	BZ	Check Post

Annex 5: Organizational Composition of Staff in Makalu Barun National Park

SN	Designation	Class	Service	Group	Number	Remarks
1	Chief Conservation Officer	Gazetted Class Second (Tech)	Forest	National Parks and Wildlife	1	
2	Assistant Conservation Officer	Gazetted Class Third (Tech)	Forest	National Parks and Wildlife	5	
3	Ranger	Non-gazetted Class First (Tech)	Forest	National Parks and Wildlife	10	
4	Na Su	Non-gazetted Class First	Administration	General Administration	1	
5	Na Su	Non-gazetted Class First	Justice	Justice	1	
6	Accountant	Non-gazetted Class First	Administration	Account	1	
7	Animal Health Technician (प.स्वा.प्रा.)	Non-gazetted Class First (Tech)	Agriculture	Veterinary	1	
8	Computer Operator	Non-gazetted Class First	Bibidh	Bibidh	1	
9	Senior Game scout	Non-gazetted Class Second	Forest	National Parks and Wildlife	15	
10	Kharidar	Non-gazetted Class Second	Administration	General Administration	1	
11	Junior Technical Assistant	Non-gazetted (Tech) Class Second	Agriculture	Agriculture Extension	1	
12	Game scout	Non-classed	Forest	National Parks and Wildlife	45	
13	Office Helper	Non-classed	Administration	General Administration	1	
14	Driver	Non-classed			1	Contract
Total					**85**	

Annex 6: Tourist Record of Makalu Barun National Park in different fiscal years

S.N.	Fiscal Year	No. of Visitors	Remarks
1	2060/61	189	
2	2061/62	103	
3	2062/63	78	
4	2063/64	227	
5	2064/65	459	
6	2065/66	1297	
7	2066/67	1678	
8	2067/68	1666	
9	2068/69	1324	
10	2069/70	1519	
11	2070/71	1108	
12	2071/72	1270	
13	2072/73	828	
14	2073/74	1576	
15	2074/75	1252	

Annex 7: Activities and Budget of the Management Plan for Makalu Barun National Park and its Buffer Zone (2075-2079)

Activities	Unit	No.	Rate	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total amount
Park Protection									
Construct HQ Office and quarter building	No.	2	17500000				20125000	21000000	41125000
Construct five sector offices and five quarters in Seduwa, Hattiya, Tamku, Bung and Mera Peak	No.	10	15000000			61500000	62250000	33000000	156750000
Construction of five posts (10 buildings) for MBNP staffs	No.	10	5000000	10000000	10250000	10500000	10750000	11000000	52500000
Fence the post and sector offices	No.	11	500000	1000000	1025000	1050000	1075000	1600000	5750000
Repair and maintainence of office buildings in HQ, Sector office, Range post, Guard post Check post	No.	20	350000	1400000	1417500	1435000	1452500	1470000	7175000
Upgrade facilities such as solar electricity for lighting and charging batteries of communication and mobile phone at security posts	No.	10	300000	600000	615000	630000	645000	660000	3150000

Construct drinking water supply for HQ, Sector office and posts	Places	15	500000	1500000	1525000	1550000	1575000	1600000	7750000
Maintain kitchen, toilet and fence of posts, Sector office and HQ regularly	No.	20	500000	2000000	2025000	2050000	2075000	2100000	10250000
Construct watch towers	No.	5	1000000	1000000	1050000	1100000	1150000	1200000	5500000
Install walky-talky radio communication throughout the Park	No.	20	100000	400000	405000	410000	415000	420000	2050000
Repair and maintenance of radio communication	No.	20	30000	0	151500	153000	154500	156000	615000
Install CCTV cameras in the check posts at Gadhi and Gola	No.	10	35000	350000	0	0	0	0	350000
Maintenance of CCTV cameras in the check posts at Gadhi and Gola	No.	5	5000		0	5500	10750	11000	27250
Sweep operations in five Sector areas once in a month	Times	200	50000	2000000	2002500	2005000	2007500	2010000	10025000
Camping operation during rainy season and winter season	Times	100	50000	1000000	1002500	1005000	1007500	1010000	5025000
Implement real time and SMART patrolling with changing time and route on random basis	Years	5	75000	75000	78750	82500	86250	90000	412500

Demarcate MBNP and BZ area	Times	1	1000000	0	1050000	0	0	0	1050000
Conduct camping and sweeping operation / joint medium and long range	Years	5	150000	1500000	150000	150000	150000	150000	750000
Procure metal detector to identify iron set leg traps probably used by poachers to trap wildlife	No.	5	25000	25000	26250	27500	28750	30000	137500
Piloting drone to take pictures of sensitive areas	Times	10	800000	1600000	1640000	1680000	1720000	1760000	8400000
Procure offroad motorcycles for effective patrolling and monitoring	No.	5	500000	500000	525000	550000	575000	600000	2750000
Procure field gears and logistics required for high altitude patrols;	Times	5	1000000	1000000	1050000	1100000	1150000	1200000	5500000
Procure 12 digital cameras, 20 GPS, 5 laptops, 20 binoculars, 8 portable gas stoves, 16 tents, 80 torch lights, 80 raincoats;	Times	1	1500000	0	1575000	0	0	0	1575000
Annual progress report publication	Times	5	100000	100000	105000	110000	115000	120000	550000
Sub Total			**46370000**	**26250000**	**29341500**	**88678500**	**110120250**	**82807000**	**337092250**

Anti-poaching and Intelligence gathering									0
Intelligence network formation in each sector and orientation	Times	5	100000	100000	105000	110000	115000	120000	550000
Mobilization of informant network	Persons	60	3000	36000	36150	36300	36450	36600	181500
Training to Park staffs Nepal Police and Army (Identification of important NTFPs, animals and their body parts with resource booklets and materials distribution)	Times	15	100000	300000	305000	310000	315000	320000	1550000
Forest/Wildlife crime investigation and registration	Times	50	50000	500000	502500	505000	507500	510000	2525000
Community-based Anti-poaching Units (CBAPU) formation	No.	6	25000		76250	77500			153750
Support to WCCB for posters, pamplets, and other materials production	Times	5	300000	300000	315000	330000	345000	360000	1650000
Purchase mobile phones, sim cards for informants.	No.	12	5000	60000					60000

Award prizes to most active CBAPU members yearly at National CBAPU Day	Times	5	50000	50000	52500	55000	57500	60000	275000
Landscape level meeting- SNP & GCA	No.	2	200000		210000		230000		440000
Trans-boundary meeting with QNR	No.	1	500000					600000	600000
District level Wildlife Crime Control Bureau Meeting	Years	3	75000	75000	78750	82500	86250	90000	412500
Sub Total				**1346000**	**1392400**	**1423800**	**1376450**	**1406600**	**8397750**
Habitat management									0
Rangeland management									0
Undertake inventory and mapping of rangelands recording XY coordinates;	Times	1	800000	800000					800000
Undertake inventory and mapping of IAS affected rangelands recording XY coordinates;	Times	1	500000	500000					500000
Undertake species diversity survey (flora and fauna) in identified rangelands;	Times	1	800000	0	800000				800000

Demarcate the grazing and non-grazing areas to regulate the livestock grazing	Times	5	200000	200000	210000	220000	230000	240000	1100000
Prepare sustainable harvesting plan for annual harvest of important rangeland NTFPs (like *Ophiocordyceps sinensis*, *Aconitum spp*, *Rheum spp*, etc)	Times	5	500000	500000	525000	550000	575000	600000	2750000
Form grazing sub-committees in BZUGs, BZUCs and register them under MBNP	Times	12	25000	150000	151250				301250
Develop grazing action plan considering carrying capacity of rangelands	Times	1	300000	0		300000			300000
Sub Total				**2150000**	**1686250**	**1070000**	**805000**	**840000**	**6551250**
Wetland Management									0
Undertake inventory and mapping of wetlands recording XY coordinates;	Times	1	800000			800000			800000
Undertake species diversity survey (flora and fauna) in identified	Times	1	800000			800000			800000

wetlands;									
Wetland Conservation Campaign for awareness (Panch Pokhari, Thulo Pokhari, Maimatti Pokhari)	Times	3	300000	0	315000	330000	345000	0	990000
Wetland Inventory of MBNP / GLOF	Times	1	500000			550000			550000
Celebrate World Wetland Day on February 02	Times	5	150000	150000	157500	165000	172500	180000	825000
Assessment for water quality of important wetlands	Times	3	75000	75000	0	82500	0	90000	247500
Regular monitoring of vulnerable lakes	Times	5	50000	50000	52500	55000	57500	60000	275000
Institutional support for disaster risk management committee	Times	5	500000	500000	525000	550000	575000	600000	2750000
Sub Total				**775000**	**1050000**	**3332500**	**1150000**	**930000**	**7237500**
Species Conservation									0
Update Flora and Fauna of MBNP	Times	2	300000	300000				360000	660000

Develop both formal and informal extension materials regarding Snow leopard, Musk deer, Red panda, Himalayan Black bear, Pangolin conservation	Times	5	150000	150000	157500	165000	172500	180000	825000
Celebrate International Snow Leopard Day on 23rd October every year	Times	5	50000	50000	52500	55000	57500	60000	275000
Organize trans-boundary conservation cooperation metings with neighbouring countries	Years	5	150000	150000	157500	165000	172500	180000	825000
Conduct awareness programmes on wildlife conservation	Years	5	100000	100000	105000	110000	115000	120000	550000
Fooding and caring for orphan and injured wildlife	Years	5	25000	25000	26250	27500	28750	30000	137500
Promote stall feeding in BZ to reduce grazing pressure	Years	5	300000	300000	315000	330000	345000	360000	1650000
Promote Fodder tree plantation in private land	No.	2500	100	50000	50005	50010	50015	50020	250050

Celebrate Wildlife week, Environment Day, Biodiversity Day, Park establishment day etc	Years	5	500000	500000	525000	550000	575000	600000	2750000
Sub Total				**1735000**	**1498782.5**	**1562565**	**1626347.5**	**3010130**	**9432825**
Wildlife Health Management									0
Establish wildlife orphanage and rescue centre at least in HQ for emergency treatment	No.	1	1500000		1575000				1575000
Treat injured animal upon arrival at orphanage and rescue centre	Times	5	25000	25000	26250	27500	28750	30000	137500
Undertake research and development works towards management of wildlife health	Times	5	350000	350000	367500	385000	402500	420000	1925000
Support to establish a community based veterinary center with epuipments required in medical emergencies.	No.	1	500000		0		575000		575000
Build capacity of frontline staff to recognize, record and report disease or poor	No.	5	250000	250000	262500	275000	287500	300000	1375000

health condition of animals or plants									
Report and document mortality of wild animals immediately after it comes to notice of any staff as part of disease survelliance strategy	No.	5	100000	100000	105000	110000	115000	120000	550000
Coordinate with DLSO to undertake postmortem of deceased wild animals	Years	5	125000	125000	131250	137500	143750	150000	687500
Carry out joint mobile health camps for livestocks in BZ with DLSO	Years	5	2500000	2500000	2625000	2750000	2875000	3000000	13750000
Sub Total				**3625000**	**5381250**	**3987500**	**4743750**	**4350000**	**22087500**
Fire Management									0
Prepare and implement fire-fighting management plan	No.	1	500000				575000		575000
Identify fire prone areas by using mapping based on satellite imagery analysis or using the web-based fire mapper	Times	1	500000			550000	0		550000

Provide fire-fighting equipment to Park posts and BZUCs.	Times	2	75000		78750	82500			161250
Mobilize fire-fighting team with equipment in order to stop spreading of fire in BZ areas	Years	5	200000	200000	210000	220000	230000	240000	1100000
Establish fireoccurrence reporting databases	Times	5	50000	50000	52500	55000	57500	60000	275000
Carry out fire prevention education and awareness activities.	Times	5	225000	225000	236250	247500	258750	270000	1237500
Conduct training to park staff and local people regarding firefighting techniques	Times	5	75000	75000	78750	82500	86250	90000	412500
Sub Total				**550000**	**656250**	**1237500**	**1207500**	**660000**	**4311250**
Encroachment Management									
Survey, map and demarcate the encroached area together with house and keep the record	Times	5	325000	325000	341250	357500	373750	390000	1787500
Issue notice to evacuate the encroached area	Times	5	125000	125000	131250	137500	143750	150000	687500

Coordinate with Local Government Authorities to resolve the encroachment problems	Times	5	75000	75000	78750	82500	86250	90000	412500
Form committee to address the issues of illegal settlers	No.	1	50000	50000	0	0	0	0	50000
Evacuate and restore the encroachments in corridors	Ha.	25	75000	375000	378750	382500	386250	390000	1912500
Sub Total				**950000**	**930000**	**960000**	**990000**	**1020000**	**4850000**
Research, Monitoring and Capacity building									0
Reasearch									
Update digital database, maps using latest topo sheets, satellite imageries for updating information on Snow leopard, Musk deer, Red panda, Grey wolf, Himalayan Black bear, Indian Pangolin, Clouded leopard, Asiatic Golden cat and Leopard cat;	Times	2	500000		525000			600000	1125000

Carry out study to acquire knowledge on Snow leopard population by using newly available genetic techniques such as genetic finger printing, photographic capture-recapture survey	Times	1	500000		525000				525000
Undertake studies to determine Snow leopard and Himalayan Black bear population, composition and abundance	Times	2	500000		525000	550000			1075000
Create baseline information on rare, endangered, endemic and protected flora and fauna with the help of national and regional experts	Times	2	300000		315000			360000	675000
Undertake an assessment of Musk deer population viability in MBNP	Times	1	300000				345000		0

Undertake intensive research on trans-boundary movement of Snow leopard and use of corridors, BZ areas and human settlement through satellite radio telemetry	Times	1	500000				575000		575000
Conduct studies on the scale, extent, and local variations in the intensity of HWC to help in identifying and designing effective mitigation measures	Times	1	350000				402500		402500
Study of distribution and abundance of various prey base species	Times	2	400000	400000				480000	880000
Undertake detailed studies on ungulate-habitat relationships and the feeding behavior of ungulates	Times	2	300000		315000			360000	675000
Carry out study on spatial distribution and abundance of Red panda	Times	2	400000			440000		480000	920000

Carry out study on spatial distribution and abundance of felids in MBNP	Times	1	400000			440000			440000
Identify indicator species to assess habitat condition	Times	1	500000		525000				525000
Study ecological processes that affect maintaining healthy wildlife population	Times	1	350000				402500		402500
Undertake study of Grey wolf about its distribution, population dynamics, preferred grass and its behavior	Times	1	300000				345000		345000
Identify critical pangolin habitat and map the priority sites	Times	1	300000		315000				315000
Study and preparation of checklist of rare, endangered, protected, migratory and resident birds	Times	2	400000			440000		480000	920000
Prepare action plan for the Strict Nature Reserve Zone management and conservation	Times	1	500000				575000		575000

Prepare landuse management plans for critical habitats of Snow leopard outside PA	Times	3	150000	150000		165000		180000	495000
Mapping of critical wildlife habitats and areas of high conservation significance with focus to SHL	Times	3	300000	300000		330000		360000	990000
Study the effect of invasive alien species to wildlife habitat	Times	1	200000		210000				210000
Undertake study to identify the succession pattern of rangelands, forests and wetlands	Times	1	200000				230000		230000
Conduct study on the effect of habitat fragmentation and degradation on wildlife survival	Times	1	350000				402500		402500
Conduct survey to identify the perception of visitors about the tourism facilities and services from hotels and Park authorities	Times	1	250000		262500				262500

Conduct study to identify potential site to promote homestay	Times	1	300000	300000					300000
Undertake marketing strategy to attract visitors in the Park and BZ	Times	1	350000	350000					350000
Conduct study of climate change indicators and impact on biodiversity conservation along with identification of adaptation activities	Times	1	300000					360000	360000
Undertake vulnerability assessment with respect to climate change	Times	1	350000			385000			385000
Prepare community-based adaptation plans for most vulnerable sections/areas	Times	1	500000			550000			550000
Undertake assessment of socio-economic condition of local people in the areas where human-wildlife conflict is high	Times	1	350000				402500		402500

Carry out relationship between anthropogenic activities and maintenance of healthy and viable wildlife populations	Times	1	500000				575000		575000
Research and study for documentation of indigenous agricultural practices such as community cooperation system for their promotion (modernization) in natural resource management	Times	1	500000					600000	600000
Review and upgrade reporting and information sharing system	Times	3	150000	150000		165000		180000	495000
Undertake evaluation of five year management plan	Times	1	500000				575000		575000
Prepare next five year management plan including IEE	Times	1	1000000					1200000	1200000
Undertake study of management effectiveness of the	Times	1	1000000					1200000	1200000

Park									
Produce a compilation report containing details about all research studies carried out in MBNP before its establishment to now	Times	1	200000		210000			240000	450000
Sub Total			**14250000**	**1650000**	**3727500**	**3465000**	**4830000**	**7080000**	**20407500**
Monitoring									0
Conduct the monitoring of Snow leopard on periodic basis by direct sightings and indirect signs	Years	5	250000	250000	262500	275000	287500	300000	1375000
Monitor Musk deer, Black bear, Grey wolf, Clouded leopard and other mammals annually using camera trap methods	Times	2	400000			440000		480000	920000
Monitor Black bear, Barking deer, Assamese monkey and other wildlife arounf BZ with local community engagement	Times	5	75000	75000	78750	82500	86250	90000	412500

Monitoring of indicator species	Times	5	50000	50000	52500	55000	57500	60000	275000
Monitoring of prey base species on regular interval	Times	5	50000	50000	52500	55000	57500	60000	275000
Monitoring of small mammals	Times	5	50000	50000	52500	55000	57500	60000	275000
Monitoring of winter migratory birds	Times	5	50000	50000	52500	55000	57500	60000	275000
Monitoring of annual harvest of important rangeland NTFPs (like Ophiocordyceps sinensis, Aconitum spp, Rheum spp, etc)	Times	5	100000	100000	105000	110000	115000	120000	550000
Undertake habitat monitoring, prepare checklist of food plants, document physical and phenological changes in vegetation, quantity and quality of discharges in streams and biotic disturbances	Years	5	350000	350000	367500	385000	402500	420000	1925000
Periodic monitoring of habitats alongside the trekking routes	Years	5	150000	150000	157500	165000	172500	180000	825000
Periodic monitoring of rangelands and	Years	5	75000	75000	78750	82500	86250	90000	412500

wetlands									
Monitor tourism impact on social, economic and cultural aspect of BZ area	Times	2	50000	0	52500	0	57500	0	110000
Tourism impact monitoring in especially in Mera Region and Makalu region	Times	2	150000		157500			180000	337500
Monitoring the progress by internal team	Times	15	75000	225000	228750	232500	236250	240000	1162500
Evaluation by DNPWC	Times	10	100000	200000	205000	210000	215000	220000	1050000
Sub Total				**1625000**	**1903750**	**2202500**	**1888750**	**2560000**	**10180000**
Capacity Building									
Orientation trainings to security troops for newly appointed Company before deployment in the field	Times	5	75000	75000	78750	82500	86250	90000	412500
Orientation trainings to Game Scouts on legal issues	Times	5	75000	75000	78750	82500	86250	90000	412500
Refreshment trainings to the field staffs and security personnels	Times	5	150000	150000	157500	165000	172500	180000	825000

Basic trainings to Game Scouts and Rangers to handle GPS equipment, camera etc	Times	5	75000	75000	78750	82500	86250	90000	412500
Conduct training on real-time SMART patrolling to Park staffs and security troops	Times	5	75000	75000	78750	82500	86250	90000	412500
Conduct anti-poaching operation trainings to Park staffs, security personnel and CBAPU members	Times	5	150000	150000	157500	165000	172500	180000	825000
Conduct crime scene investigation and interrogation trainnings to investigators as per legal provision	Times	5	75000	75000	78750	82500	86250	90000	412500
Conduct human rights trainings to handle the convicted persons	Times	5	50000	50000	52500	55000	57500	60000	275000
Wildlife management and handling trainings with focus to Black bear, birds, wild boars, deers, and monkeys	Times	2	200000	0	210000	0	230000	0	440000
Conduct trainings on wildlife habitat and population monitoring	Times	2	200000		210000		230000		440000

techniques									
Trainings about field techniques, including signs, sounds and other indirect evidences of different wildlife species	Times	2	200000		210000		230000		440000
Train staffs to collect sample of blood, scats, pellets, urine or vital organs	Times	2	150000		157500		172500		330000
CITIES training	Times	2	75000		78750		86250		165000
Basic training on vegetation quantification for recording data in monitoring plots	Times	2	250000			275000	0	300000	575000
Provide trainings to the Park staff about wildlife habitat monitoring	Times	3	200000	200000	0	220000	0	240000	660000
Conduct forest fire management trainings for Park staffs, security personnel and BZUGs members	Times	3	200000	200000	0	220000	0	240000	660000

Provide trainings to nature guides to enhance their capacity in nature interpretation specifically on wildlife, birds and plants etc	Times	3	250000	250000	0	0	287500	300000	837500
Trainings on nature interpretation and display management	Times	2	200000				230000	240000	470000
Social mobilization trainings	Times	2	500000		525000		575000	0	1100000
Appreciative enquiry trainings	Times	3	150000			165000	172500	180000	517500
Conflict management trainings	Times	3	200000	200000	0	220000	0	240000	660000
Organization development and management trainings	Times	2	500000	500000	0	0	0	600000	1100000
Leadership development trainings	Times	3	300000			330000	345000	360000	1035000
Account keeping trainings	Times	5	150000	150000	157500	165000	172500	180000	825000
General and specialized Training of Trainers (ToT)	Times	2	500000			550000		600000	1150000
Public administration and management training	Times	2	400000			440000		480000	920000
Trainings to CBAPUs	Times	5	300000	300000	315000	330000	345000	360000	1650000

Geographical Information System (GIS) training to Rangers and Officers	Times	3	250000	0	262500	0	287500	300000	850000
Sub Total				**2525000**	**2887500**	**3712500**	**4197500**	**5490000**	**18812500**
Tourism									0
Construct multipurpose Visitor Information Centre (VIC) with ticket counter, display centre providing information, video documentary showing hall, museum, souvenir shop and rest room	No.	3	15000000			16500000	17250000	18000000	51750000
Place information boards related showimg important tourist destinations and tourism products at key locations	No.	2	500000	0	0	550000	575000	0	1125000
Erect hoarding boards on the trekking routes	No.	20	30000	120000	121500	123000	124500	126000	615000
Conduct home-stay and house keeping training	Times	3	250000	250000	262500	275000			787500
Organize cleanup campaign to manage garbage in the Park and BZ areas	Times	15	50000	150000	152500	155000	157500	160000	775000

Publish news and article in newspaper	Times	5	100000	100000	105000	110000	115000	120000	550000
Production of video documentary	Times	1	100000				115000		115000
Upgrade the existing trekking trail	km	30	2500000	15000000	15125000	15250000	15375000	15500000	76250000
Bridge and culvert maintenance	No.	20	300000			2130000	2145000	1860000	6135000
Support for maintenance of monasteries	No.	15	800000	2400000	2440000	2480000	2520000	2560000	12400000
Tourism coordination committee meeting	No.	10	100000	200000	205000	210000	215000	220000	1050000
Sub Total				**18220000**	**18411500**	**37783000**	**38592000**	**38546000**	**151552500**
Climate Change and Solid Waste Management									0
Cimate Change Adaptation									0
Pilot Early warning system of GLOF disaters	No.	2	750000		787500		862500		1650000
Support Disaster Risk Management Committee.	Years	5	50000	50000	52500	55000	57500	60000	275000
Study impacts of changes in precipitation and temperatures on species and ecosystem	Times	2	250000	250000				300000	550000

Identify and support implementation of adaptation priorities of BZ community forest user groups such as small-scale irrigation construction, repair and maintenance	Times	5	250000	250000	262500	275000	287500	300000	1375000
Sub Total				**550000**	**1102500**	**330000**	**1207500**	**660000**	**3850000**
Garbage Management									0
Construct waste disposal pits or put waste collection pots near entry point, ticket counter and along the trekking routes	No.	25	20000	100000	101000	102000	103000	104000	510000
Support eco-clubs to organize clean-up campaign regularly	Years	5	50000	50000	52500	55000	57500	60000	275000
Sub Total				**150000**	**153500**	**157000**	**160500**	**164000**	**785000**
Buffer Zone Management									
Provide support to BZCFUG to develop and renew constitutions and Ops;	No.	50	45000	450000	452250	454500	456750	459000	2272500
Support in institutional strengthening of BZ communitites;	Years	5	500000	500000	525000	550000	575000	600000	2750000

Support to operate private nurseries in each sectors;	Times	4	500000		525000	550000	575000	600000	2250000
Organize sensitization programme in the BZ to restore and manage wetlands;	Times	5	225000	225000	236250	247500	258750	270000	1237500
Strengthen, institutionalize and develop a network of community based anti-poaching and intelligence CBAPUs;	Times	5	250000	250000	262500	275000	287500	300000	1375000
Prepare livelihood improvement strategy	No.	1	500000			550000			550000
Implement relief fund for victims of human wildlife conflict	Years	5	500000	500000	525000	550000	575000	600000	2750000
Strengthen "Eco-club" programme in schools of BZ designing MBNP specific nature conservation course	Times	5	50000	50000	52500	55000	57500	60000	275000
Initiate conservation focused programme in schools of BZ through Training of Trainer (ToT) on biodiversity conservation	Years	5	500000	500000	525000	550000	575000	600000	2750000

Form, strengthen and mobilize Eco-clubs in clean-up campaigns, awareness and capacity building events and plantation initiatives	Years	5	75000	75000	78750	82500	86250	90000	412500
Support Community Based Anti-poaching Unit	Years	5	150000	150000	157500	165000	172500	180000	825000
Produce and disseminate Information Education and Communication (IEC) material;	Times	1	300000		315000				315000
Celebrate Conservation Days	Years	5	250000	250000	262500	275000	287500	300000	1375000
Sub Total				**1775000**	**2178750**	**2502500**	**2041250**	**2130000**	**10627500**
Administrative									
Coordination meeting with stakeholders	Times	5	150000	150000	157500	165000	172500	180000	825000
Trimester level staff meeting	Times	15	150000	150000	157500	165000	172500	180000	825000
Procure multimedia projector	No.	1	90000		94500				94500
Maintenance of vehicle and motorbikes	Years	5	300000	300000	315000	330000	345000	360000	1650000
Fuel for vehicle	Litre	5000	115	115000	115005.75	115011.5	115017.25	115023	575057.5

Management of office equipment (like toner refill of printers)	Years	5	100000	100000	105000	110000	115000	120000	550000
Stationeries	Years	5	100000	100000	105000	110000	115000	120000	550000
Procure furniture	Years	5	200000	200000	210000	220000	230000	240000	1100000
Payment of electricity, telephone, Internet	Years	5	200000	200000	210000	220000	230000	240000	1100000
Sub Total				**1315000**	**1469506**	**1435012**	**1495017**	**1555023**	**7269558**
Grand Total				**65191000**	**73770938**	**153839877**	**176431815**	**153208753**	**623444883**

Five Year Plan of Buffer Zone Management Committee, MBNP

S.N.	Activities	Unit	Quantity	Rate	Year I	Year II	Year III	Year IV	Year V	Total Amount
1	Organize BZMC meetings	Times	15	75000	225000	228750	232500	236250	240000	1162500
2	Orientation training regarding conservation legislation to BZ comminities	Times	3	50000	50000	0	55000	0	60000	165000
3	Organize Buffer CFUG management trainings	No.	12	50000	100000	102500	105000	107500	210000	625000
4	Provide support to train BZUC to prepare five year management plan	Times	10	150000	300000	307500	315000	322500	330000	1575000
5	Provide leadership training to Presidents and Vice Presidents of BZUG and BZUC	No.	12	175000	350000	358750	367500	376250	735000	2187500
6	Provide account keeping training to Secretary or Treasurer	Times	12	175000	350000	358750	367500	376250	735000	2187500
7	Provide support to organize cooperative management training	Times	5	150000	150000	157500	165000	172500	180000	825000
8	Construct drinking water supply to schools of BZ	No.	5	125000	125000	131250	137500	143750	150000	687500
9	Learning visit of MBNP staffs and BZMC members	Times	5	500000	500000	525000	550000	575000	600000	2750000
10	Educational tour of Eco-Club members to learn participatory biodiversity conservation	Times	3	300000			330000	345000	360000	1035000

11	Design and pilot monitoring plots to study the status of Sal forests	Times	2	250000			275000	0	300000	575000
12	Conduct awareness programs with distribution materials to control shifting cultivation and also to demonstrate alternative farming systems in the BZ area	Times	5	50000	50000	52500	55000	57500	60000	275000
13	Conduct awareness program on Wildlife Damage Relief Guidelines 2012 through outreach programs for implementation of compensation mechanism	Times	5	150000	150000	157500	165000	172500	180000	825000
14	Document indigenous agricultural practices such as community cooperation system for their promotion	Times	1	400000			440000	0	0	440000
15	Prepare Local Adaptation Plan of Action (LAPA) for 12 BZUCs	No.	12	150000	300000	307500	315000	322500	630000	1875000
16	Organize coordination and interactions with District Agriculture Development Office and District Livestock Service Office to extend agriculture extension services in BZUCs	No.	12	50000	100000	102500	105000	107500	210000	625000

17	Provide training on agro forestry, processing and marketing of NTFPS, off-season vegetables, sheep, chauri, goat, and pig farming	No.	12	75000	150000	153750	157500	161250	315000	937500
18	Prepare NTFPs operational plan giving emphasis on the species based on their values, abundance, demand, and local knowledge	No.	50	45000	450000	452250	454500	456750	459000	2272500
19	Conduct basic and advance conservation education to local community and institutions	No.	12	50000	100000	102500	105000	107500	210000	625000
20	Provide conservation educational materials to schools and communities	No.	12	50000	100000	102500	105000	107500	210000	625000
21	Survey and document degraded forests along the potential corridors	No.	1	300000			330000			330000
22	Organize coordination meetings with DFO and other stakeholders for protecting forests along the potential corridors	Times	5	50000	50000	52500	55000	57500	60000	275000
	Total				**3600000**	**3653500**	**5187000**	**4205500**	**6234000**	**22880000**

Five Year Plan of Buffer Zone User Committees, MBNP										
Chepuwa BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000		105000				105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									
2.1	Micro hydro/peltric set construction	No.	1	500000			550000			550000
2.2	Community building construction and maintenance	No.	1	200000			220000			220000
2.3	Trail and trekking route construction and renovation support	Km	3	500000	500000		550000		600000	1650000
2.4	Park, market	No.	1	100000				115000		115000

	establishment/management									
2.5	Playground construction	No.	1	75000		78750				78750
2.6	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.7	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.8	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.9	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000

4	**Conservation Education**									
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**178500 0**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Pukhuwa Dobhan BZUC

S.N.	Activities	Unit	Quantity	Rate	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total amount
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000		105000				105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000		550000		600000	1650000
2.3	Park, market establishment/management	No.	1	100000				115000		115000
2.4	Playground construction	No.	1	75000		78750				78750
2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000

2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school,	Times	5	50000	50000	52500	55000	57500	60000	275000

	mothers groups, shepards etc)									
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000		63000				63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**2455500**	**3313250**	**2196000**	**11291750**

Mangtewa BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total Amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000

1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Micro hydro/peltric set construction	No.	1	500000			550000			550000
2.2	Community building construction and maintenance	No.	1	200000			220000			220000
2.3	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.4	Park, market establishment/management	No.	1	100000			0	115000		115000
2.5	Playground construction	No.	1	75000		78750				78750
2.6	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.7	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.8	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.9	Cultural museum establishment	No.	1	1500000				1725000		1725000

3	**Skill Development and Income Generation**									
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500

4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Tamku BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000

1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/management	No.	1	100000			0	115000		115000
2.4	Playground construction	No.	1	75000		78750				78750
2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000

2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									0
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									0
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000

4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**2455500**	**3313250**	**2196000**	**11291750**

Bala BZUC										
S.N.	**Activities**	**Unit**	**No.**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000

1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/management	No.	1	100000			0	115000		115000
2.4	Playground construction	No.	1	75000		78750				78750
2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									

3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									0
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management	Year	5	50000	50000	52500	55000	57500	60000	275000

	(compensation)									
5	**Administration Cost**									0
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**2455500**	**3313250**	**2196000**	**11291750**

Sisuwa Khola BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000		105000				105000

1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									
2.1	Micro hydro/peltric set construction	No.	1	500000			550000			550000
2.2	Community building construction and maintenance	No.	1	200000			220000			220000
2.3	Trail and trekking route construction and renovation support	Km	3	500000	500000		550000		600000	1650000
2.4	Park, market establishment/management	No.	1	100000				115000		115000
2.5	Playground construction	No.	1	75000		78750				78750
2.6	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.7	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.8	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.9	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									

3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500

4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000		63000				63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Bung BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000

1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/management	No.	1	100000			0	115000		115000
2.4	Playground construction	No.	1	75000		78750				78750
2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									0
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000

3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									0
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000

5	**Administration Cost**									0
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**2455500**	**3313250**	**2196000**	**11291750**

Cheskam BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/manageme	No.	1	100000			0	115000		115000

	nt									
2.4	Playground construction	No.	1	75000		78750				78750
2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									0
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000

4	**Conservation Education**									0
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									0
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**2455500**	**3313250**	**2196000**	**11291750**

Kimathanka BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	3	100000	100000	0	110000	0	120000	330000
1.2	Gumba/Temple protection/renovation	No.	3	50000	0	52500	0	57500	60000	170000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/management	No.	1	100000			0	115000		115000
2.4	Playground construction	No.	1	75000		78750				78750

2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income generation**									
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									

4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1735000**	**1437000**	**2400500**	**3198250**	**2196000**	**10966750**

Arun Barun BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									
2.1	Micro hydro/peltric set construction	No.	1	500000			550000			550000
2.2	Community building construction and maintenance	No.	1	200000			220000			220000
2.3	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.4	Park, market establishment/manageme	No.	1	100000			0	115000		115000

	nt									
2.5	Playground construction	No.	1	75000		78750				78750
2.6	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.7	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.8	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.9	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									

4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Pathivara BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Community building construction and maintenance	No.	1	200000			220000			220000
2.2	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.3	Park, market establishment/management	No.	1	100000			0	115000		115000
2.4	Playground construction	No.	1	75000		78750				78750

2.5	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.6	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.7	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.8	Cultural museum establishment	No.	1	1500000				1725000		1725000
3	**Skill Development and Income Generation**									0
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000
4	**Conservation Education**									0
4.1	Solid waste management	Time	5	50000	50000	52500	55000	57500	60000	275000

	extension	s								
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									0
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Seduwa BZUC										
S.N.	**Activities**	**Unit**	**Quantity**	**Rate**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total amount**
1	**Conservation Program**									
1.1	Forest fire, fire line management	Km	5	100000	100000	105000	110000	115000	120000	550000
1.2	Gumba/Temple protection/renovation	No.	5	50000	50000	52500	55000	57500	60000	275000
1.3	Commnity forest management, office management training, Forest resource management training	Times	5	40000	40000	42000	44000	46000	48000	220000
1.4	Religious site conservation	No.	1	100000	0	105000	0			105000
1.5	Species conservation zoning	Times	1	250000			275000			275000
1.6	Community cleaning	Times	5	50000	50000	52500	55000	57500	60000	275000
2	**Community Development**									0
2.1	Micro hydro/peltric set construction	No.	1	500000			550000			550000
2.2	Community building construction and maintenance	No.	1	200000			220000			220000
2.3	Trail and trekking route construction and renovation support	Km	3	500000	500000	0	550000	0	600000	1650000
2.4	Park, market establishment/manageme	No.	1	100000			0	115000		115000

	nt									
2.5	Playground construction	No.	1	75000		78750				78750
2.6	School building/ compound construction/ maintenance	No.	2	50000		52500			60000	112500
2.7	Wooden bridge construction/maintenance	No.	1	100000	100000					100000
2.8	Drinking water construction/renovation/aid	No.	3	100000			110000	115000	120000	345000
2.9	Cultural museum establishment	No.	1	2E+06				1725000		1725000
3	**Skill Development and Income Generation**									0
3.1	Leadership development training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.2	Genetically improved breed species distribution	Times	5	100000	100000	105000	110000	115000	120000	550000
3.3	Home garden, farming, IMP training, livestock farming training	Times	5	50000	50000	52500	55000	57500	60000	275000
3.4	NTFP farming training (cardamum, chiraito, allo, satuwa, etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
3.5	Nature Guide and Hotel Management Training	Times	5	75000	75000	78750	82500	86250	90000	412500
3.6	Health related training, CMA, Anami, ect	Times	5	100000	100000	105000	110000	115000	120000	550000
3.7	NTFP Farming in community level	Times	5	150000	150000	157500	165000	172500	180000	825000

4	**Conservation Education**									0
4.1	Solid waste management extension	Times	5	50000	50000	52500	55000	57500	60000	275000
4.2	Board(hoarding wooden) display about conservation	No.	15	15000	45000	45750	46500	47250	48000	232500
4.3	Conservation, law, etc workshops (school, mothers groups, shepards etc)	Times	5	50000	50000	52500	55000	57500	60000	275000
4.4	Conservation day celebration	Times	5	25000	25000	26250	27500	28750	30000	137500
4.5	Scholarship distribution to students	No.	5	25000	25000	26250	27500	28750	30000	137500
4.6	Human wildlife conflict management (compensation)	Year	5	50000	50000	52500	55000	57500	60000	275000
5	**Administration Cost**									0
5.1	Stationary	Years	5	25000	25000	26250	27500	28750	30000	137500
5.2	Communication	Years	5	10000	10000	10500	11000	11500	12000	55000
5.3	Field Gear	Times	1	60000	0	63000	0	0	0	63000
5.4	Conservation Coordination	Years	5	30000	30000	31500	33000	34500	36000	165000
5.5	Miscellaneous	Years	5	60000	60000	63000	66000	69000	72000	330000
	Total				**1785000**	**1542000**	**3005500**	**3313250**	**2196000**	**11841750**

Annex 8: Record of fire incidence in BZCFs of MBNP during March 3rd-4th week, 2011

S.N.	Name of BZCF	VDCs occupied	Area (Ha)	Date	Damaged area (ha)	Description of damage
1	Damfangma BZCF	Chepuwa-4,5,6	367	Chaitra 18, 2065	30	
2.	Chheteje BZCF	Yafu 4,5,6	60	Chaitra 5,2065	7	Awareness in local area provision of informer and punishment for the culprit of fire incidence
3.	Melan BZCF	Yafu 6	60	Chaitra 7,2065	9	minor damage
4.	Gadi BZCF	Pathebhara .4	3	Chaitra 17,2066	3	minor damage
5.	Akchewa BZCF	Pathebhara-9	18	Chaitra 17-19	10	Schima and Alnus plant burnedWomen extinguished fire, conservation initiated]
6.	Shapdokha kharukham BZCF	Tamku-9	713	Chaitra 18, 2065	60	—
7.	Laligurash BZCF	Tamku-2	50	Chaitra 17	50	All plant burned, “Malingo” forest burnt
8.	Yayokkha BZCF	Bala-5	70	Chaitra 16-17	70	plant burned
9.	walankha BZCF	Bala-6	250	Chaitra -17	50	plant burned
10	Sumnema , BZCF	Makalu 8	60	Chaitra-8	50	minor damage
11	Aruda BZCF	Makalu-6	50		10	minor damage
12	Hunga BZCF	Cheskam 1,2,6,78	320	Chaitra-14	10	minor damage
13	Melan BZCF	Sisuwa khola -9	300	Chaitra 2nd week	30	minor damage
14	Bukurchon BZCF	Sisuwakhola -7,8	280	Chaitra 2nd week	20	minor damage
15	Laligurash BZCF	Mantewa -1,2	200	Chaitra 2nd week	50	plant burned
16	Nageswari BZCF	Mantewa -3	50	Chaitra 2nd week	30	plant burned
17	Salleari BZCF	Mantewa -4	161.2	Chaitra 2nd week	35	plant burned

18	Sayepatri BZCF	Mantewa -4	67	Chaitra 2nd week	20	plant burned
19	Sunsari BZCF	Mantewa -5	55	Chaitra 2nd week	5	plant burned
20	Kalleand BZCF	Mantewa -6	60	Chaitra 2nd week	5	plant burned
21	Baguwa BZCF	Mantewa-7	87.6	Chaitra 2nd week	15	plant burned
22	Arun BZCF	Mantewa	69	Chaitra 2nd week	43	plant burned, one house burned
23	Dewrali BZCF	Mantewa -8	20	Chaitra 2nd week	7	plant burned
24	Muna BZCF	Mantewa -8	47	Chaitra 2nd week	5	plant burned
25	Arun BZCF	Mantewa -9	75.3	Chaitra 2nd week	11	plant burned
25	Saddi Shanti BZCF	Mahakulung -3, Bung	159	2074 Mangsir 25	10	plant burned
26	Pelmang BZCF	Mahakulung -2, Bung	587	2074 Mangsir 27	2	plant burned
27	Lomba Temwang BZCF	Bhotkhola-2, Gola	264	2074 Magh 29	35	plant burned
28	Naghitar BZCF	Shilichong-2	167	2074 Magh 29	50	plant burned
29	Yamdang BZCF	Shilichong-2	80	2074 Magh 29	17	plant burned
30	Bukur Chong BZCF	Shilichong-1	490	2074 Magh 29	68	plant burned

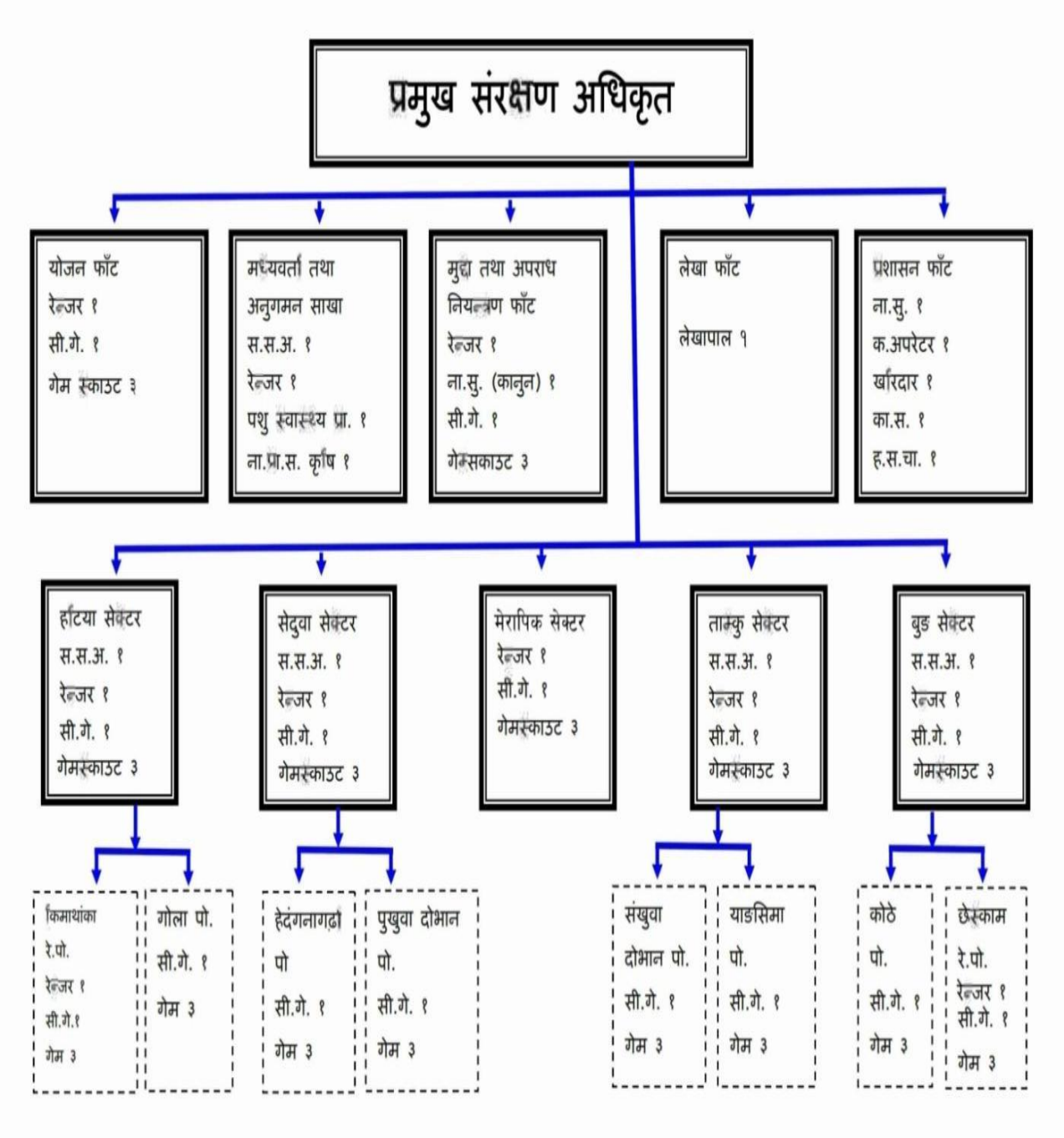
Annex 9: Hotels Currently in Operation in MBNP

S.N.	Name of Hotel	Estd Year (B.S.)	District	Location	Area (sq.m.)
1	Buddha Hotel and Lodge	2064	Solukhumbu	Thasidingma	508.7
2	Pancha Tea Shop	2065	Solukhumbu		
3	New Mera Panch Pokhari Hotel	2057	Solukhumbu	Khola Kharka	1780.5
4	Mera Peak View Hotel	2068	Solukhumbu	Khola Kharka	1526.1
5	Mera Peak Hotel and Lodge	2072	Solukhumbu		508.7
6	Mahakulung Hotel	2065	Solukhumbu		
7	Hotel View Point	2060	Solukhumbu		
8	Silichong View Hotel and Lodge		Solukhumbu		
9	Paradise Tea Shop	2064	Solukhumbu	Khongmading	2034.8
10	Khongmading Tea Shop	2065	Solukhumbu	Khongmading	2034.8
11	Snow Lodge and Restaurant	2065	Solukhumbu	Khare	1271.8
12	Himalayan View Lodge	2056	Solukhumbu	Khare	1526.1
13	Top Den Tea House	2056	Solukhumbu	Khare	254.35
14	Pemba Tea House	2056	Solukhumbu	Khare	1017.4
15	Mera Alpinie Lodge	2056	Solukhumbu	Khare	1526.1
16	Tashi Tea House	2058	Solukhumbu	Khare	254.35
17	Sherpa Tea Shop	2058	Solukhumbu	Khare	508.7
18	Mera Peak View Hotel	2058	Solukhumbu	Khare	763.05
19	Mera View Lodge	2060	Solukhumbu	Khare	1271.8
20	Mera Guest House	2067	Solukhumbu	Khare	1017.4
21	Pemba Tea Shop	2058	Solukhumbu	khare	763.05
22	Everest Summit Lodge	2061	Solukhumbu	Khare	1271.8
23	Dawa Tea House	2061	Solukhumbu	Khare	763.05
24	Fu Lamu Tea House	2065	Solukhumbu	Khare	1017.4
25	Mountain View Lodge and Restaurant	2067	Solukhumbu	Khare	2034.8
26	Chamlang Tea Shoop	2068	Solukhumbu	Khare	1017.4
27	Mera Refuge Hotel	2070	Solukhumbu	Khare	1017.4
28	Bhim Tea House	2065	Solukhumbu	Kothe	1017.4

29	Bhola Tea House	2065	Solukhumbu	Kothe	1017.4
30	Namaste Lodge	2052	Solukhumbu	Kothe	1271.8
31	Mera La Lodge	2054	Solukhumbu	Kothe	508.7
32	Sherpa Guest House	2058	Solukhumbu	Kothe	763.05
33	Kulung Hotel	2060	Solukhumbu	Kothe	1271.8
34	Sayapatri Tea House	2061	Solukhumbu	Kothe	1526.1
35	Himalayan Hotel	2058	Solukhumbu	Kothe	1526.1
36	Mera Peak Hotel	2063	Solukhumbu	Kothe	763.05
37		2064	Solukhumbu	Kothe	763.05
38		2064	Solukhumbu	Kothe	254.35
39	Purni Tea Shop	2062	Solukhumbu	Kothe	763.05
40	Barunche Hotel	2061	Solukhumbu	Kothe	1271.8
41	Lama Lodge	2068	Solukhumbu	Kothe	1271.8
42	Himalayan Tea Shop	2065	Solukhumbu	Kothe	254.35
43	Salpa View Lodge	2061	Solukhumbu	Cholem	1526.1
44	Pemba Tea House	2061	Solukhumbu	Dik Kharka	254.35
45	Milan Tea House	2066	Solukhumbu	Dik Kharka	508.7
46	Palaha Tea Shop	2049	Solukhumbu	Palaha	1526.1
47	Tara Chiya Pasal	2067	Solukhumbu	Jhar Kharka	254.35
48	Kami Tea House	2065	Solukhumbu	Mera La	254.35
49	Mingma Tea House	2065	Solukhumbu	Mera La	1017.4
50	Barunche Tea House	2064	Solukhumbu	Barunche	1526.1
51	Kailash Tea House	2067	Solukhumbu	Seto Pokhari	
52	Pemba Guest House	2047	Solukhumbu	Thangnak	1271.8
53	Siona Guest House	2047	Solukhumbu	Thangnak	2034.8
54	Aang Dawa Tea House	2049	Solukhumbu	Thangnak	1017.4
55	Dawa Gylzen Tea House	2049	Solukhumbu	Thangnak	1017.4
56	Mera Guest House	2070	Solukhumbu	Thangnak	2034.8
57	Kushum Khangaroo View Lodge	2050	Solukhumbu	Thangnak	1526.1
58	Himalayan Lodge	2049	Solukhumbu	Thangnak	1780.5
59	Mera Snow Line Hotel	2059	Solukhumbu	Thangnak	1526.1
60	Prawin Tea House	2061	Solukhumbu	Thangnak	2034.8
61	Knigma Lamu Tea House	2065	Solukhumbu	Thangnak	254.35
62	Kubir Tea House	2069	Solukhumbu		1017.4
63	Tashi Dile Tea House	2065	Solukhumbu	Taktor	1017.4

64	Him Shikhar Hotel and Lodge	2065	Solukhumbu	Taktor	508.7
65	Doma Lodge	2060	Solukhumbu	Taktor	1526.1
66	Doma Hotel and Lodge	2065	Solukhumbu	Taktor	508.7
67	Lali Guransh Hotel	2069	Solukhumbu	Chhatar Khola	508.7
68	Danphe Hotel	2069	Solukhumbu	Chhatar Khola	763.05
69	Chattar Khola Tea Shop	2070	Solukhumbu	Chhatar Khola	1526.1
70	Sukha Tea House	2067	Solukhumbu	Seto Pokhari	254.35
71	Lochhe View Hotel	2070	Solukhumbu	Seto Pokhari	1526.1
72	Jangbo Tea Shop	2062	Solukhumbu	Saure	1017.4
73	Anil Tea Shop	2066	Solukhumbu	Saure	1017.4
74	Kulung Hotel	2065	Solukhumbu		0
75	Sherpa Tea House	2066	Solukhumbu	Saure	508.7
76	Dawa Gylzen Tea House	2064	Solukhumbu	Seto Pokhari	508.7
77	Kulung Hotel	2067	Solukhumbu	Rangdang	254.35
78	Hotel Makalu Barun	2048	Sankhuwasabha	Yangle Kharka	510
79	Tadasha Hotel		Sankhuwasabha	Tadasha	510
80	Hotel Base Camp		Sankhuwasabha	Makalu Base Camp	510
81	Hotel Makalu		Sankhuwasabha	Makalu Base Camp	510
82	Barun Tea House		Sankhuwasabha	Yangle Kharka	510
83	Hotel Yak		Sankhuwasabha	Yak Kharka	510
84	Khongma Tea House		Sankhuwasabha	Khongma	510
85	Makalu Base Camp Hotel		Sankhuwasabha	Makalu Base Camp	510
86	Shiva View Hotel	2052	Sankhuwasabha	Khongma	510
87	Dobate Hotel		Sankhuwasabha	Dobate	510
88	Hotel Yak Kharka		Sankhuwasabha	Yak Kharka	510
89	Hotel Yangle		Sankhuwasabha	Yangle Kharka	510
90	Thulo Pokhari Tea Shop		Sankhuwasabha	Thulo Pokhari	255
91	Phema Tak Tea House		Sankhuwasabha	Fematang	255

Annex 10: Organogram of MBNP Administration



Annex 11: Boundary of MBNP and BZ

श्री ५ को सरकार

वन तथा वातावरण मन्त्रालयको

सूचना १

राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण ऐन, २०२९ को दफा ३ को उपदफा (१) ले दिएको अधिकार प्रयोग गरी श्री ५ को सरकारले सगरमाथा अञ्चलको सोलु-खुम्बु जिल्ला र कोशी अञ्चलको संखुवासभा जिल्लाको देहायबमोजिम चार किल्ला भित्रको क्षेत्रलाई मकालु वरुण राष्ट्रिय निकुञ्ज तथा संरक्षण क्षेत्र घोषित गरेको छ ।

मकालु-वरुण राष्ट्रिय निकुञ्जको चार किल्ला:

१. उत्तर:-

पेथाङ्गत्से (जहाँ सगरमाथा राष्ट्रिय निकुञ्जको उत्तर पूर्व सिमाना टुङ्गिन्छ) बाट पूर्वतर्फ नेपाल-तिब्बत (चीनको स्वशासित क्षेत्र) बीचको अन्तरराष्ट्रिय सिमानै सिमाना हुँदै पूर्व पोप्ती भन्ज्याङ (४३० मि.) को पश्चिमपट्टिको उच्च भागसम्म ।

२. पूर्व:-

पोप्ती भन्ज्याङदेखि शुरु भई ठूलो र सानो वुम ठाकको भुङ्खलै भुङ्खला हुँदै हटिया गाँउको पश्चिममा पर्ने मौसेरेक र सेरेकको धारैधार भई सिम्पुङ गाउँको पश्चिमी किनारा हुँदै अरुण-वरुणको दोभानसम्म ।

३. दक्षिण:-

अरुण-वरुण दोभानबाट उत्तर पश्चिम हुँदै हिन्जुसम्म । हिन्जुबाट वरुण खोलाको जलाधार र वाङ र नेमु खोलाको जलाधारलाई छुट्याउने डाँडाको धार हुँदै नेमु खोलाको शिरसम्म । नेमु खोलाको शिरबाट लगातार दक्षिण पूर्वतर्फको डाँडाको धार पछ्याउँदै कसुवा खोलाको करिब २००० मिटरको उचाइसम्म । कसुवा खोलाबाट यसले

(३)

पश्चिमी शृङ्खला हुँदै टासि गाउँको माथिको उच्च बिन्दुसम्म । त्यहाँबाट तलतिर भर्दै नुरबु गाउँको उत्तरपट्टि डसुवा खोलासम्म । त्यसपछि यसले नुरबु गाउँको माथिको उत्तरपट्टिको डाँडाको धारलाई पछ्याउँदै पताकारे डाँडासम्म र फेरी यो पताकारेको डाँडाको शिरैशिर दक्षिणतर्फ माछे खोला (अपसुवा खोलाको शाखा खोला) को मुहानसम्म । त्यसपछि सिमाना फेरी माछे खोलालाई पछ्याउँदै अपसुवा खोलासम्म । त्यसपछि अपसुवा खोलै खोला उत्तरतर्फ बावाताक गाउँ नजीक २००० मि. को उचाईमा । त्यसपछि बावाताक र गोऽथाला गाउँदेखि उत्तरतर्फको डाँडाको शृङ्खलै शृङ्खला हुँदै ससिमा (हलेऽखर्क) गाउँलाई भित्र पारी चाऽग्रे डाँडा (खोऽलुवा खोलाको जलाधार) सम्म । चाऽग्रेबाट लगातार रूपले सीमा रेखा याचपखा र शिवदिङ गाउँदेखि उत्तरतर्फ रहेको खोरिया आवादीको सिरानै सिरान हुँदै संखुवा खोला पारी धर्मशाला खर्क हुँदै केन्पा खर्कको वतासे डाँडा (४५०० मि.) सम्म । केन्पा खर्कबाट पश्चिमतर्फ भर्ने डाँडाको धार पछ्याउँदै मुवी खर्क मुनीपट्टि पर्ने होऽगु खोलासम्म ।

४. पश्चिमः—

मादी खर्कबाट पश्चिम र उत्तर पश्चिम हुँदै पाँच पोखरी (मुनीलो) सम्म पाँच पोखरीबाट पश्चिमतर्फ चेरेम गाउँदेखि उत्तर-पश्चिम ईन्खु खोलासम्म । त्यहाँबाट उत्तर पश्चिम हुँदै लुक्ला माथि जतर्वा भन्ज्याङसम्म । जतर्वाबाट कालो हिमाल र कुसुम्खाङको शिखर हुँदै मन्जु खोलाको मुहानसम्म । त्यहाँबाट उत्तरतर्फ सगरमाथा राष्ट्रिय निकुञ्जको पूर्वी सिमानै सिमाना हुँदै फेताङचे हिमालसम्म ।

सूचना २

मकालु—बरुण संरक्षण क्षेत्रको चार किल्लाः

१. पूर्वः—

अरुण खोलाको शिर (नेपाल—चीनको अन्तरराष्ट्रिय सिमाना) बाट शुरु भई अरुण खोलै खोला हुँदै संखुवा खोला र अरुण खोलाको दोभानसम्म ।

२. दक्षिणः—

संखुवा खोला र अरुण खोलाको दोभानबाट पश्चिमतर्फ साउने डाँडाको शिरै शिर बुकुरखोलाको (होऽगु खोलाको शाखा) सिरानसम्म । त्यहाँबाट बुकुर खोलै खोला हुँदै होऽगु र बुकुर खोलाको दोभान हुँदै दक्षिणतर्फ होऽगु खोलै खोला बुऽग गाउँको फेदीसम्म ।

३. पश्चिमः—

होङ्गु खोला (बुङ्ग गाउँको फेदी) बाट बुङ्ग गाउँको पश्चिमपट्टिको डाँडाको धारैधार सुर्केलासम्म । सुर्केलाबाट चेरेम गाउँको सिरान हुँदै हिङ्कु खोलासम्म ।

४. उत्तरः—

अरूण—वरूण दोभानबाट उत्तर पश्चिम हुँदै हिन्जुसम्म । हिन्जुबाट वरूण खोलाको जलाधार र वाङ र नेमु खोलाको जलाधारलाई छुट्याउने डाँडाको धार हुँदै नेमु खोलाको शिरसम्म । नेमु खोलाको शिरबाट लगातार दक्षिण पूर्व तर्फको डाँडाको धार पछ्याउँदै कसुवा खोलाको करिब २००० मिटरको उचाइ-सम्म । कसुवा खोलाबाट यसले पश्चिमी भुङ्खला हुँदै टासि गाउँको माथिको उच्च विन्दुसम्म । त्यहाँबाट तलतिर झर्दै नुरवु गाउँको उत्तरपट्टि डसुवा खोलासम्म । त्यसपछि यसले नुरवु गाउँको माथिको उत्तरपट्टिको डाँडाको धारलाई पछ्याउँदै पताकारे डाँडासम्म र फेरी यो पताकरेको डाँडाको शिरै शिर दक्षिणतर्फ माछे खोला (अपसुवा खोलाको शाखा खोला) को मुहानसम्म । त्यसपछि सिमाना फेरी माछे खोलालाई पछ्याउँदै अपसुवा खोलासम्म । त्यसपछि अपसुवा खोला खोला उत्तरतर्फ हुँदै दावाताक गाउँ नजीक २००० मी. सम्म । त्यसपछि दावाताक र गोङ्थाला गाउँ देखि उत्तरतर्फको डाँडाको भुङ्खलै भुङ्खला हुँदै ससिमा (हलेङ्खर्क) गाउँलाई बाहिर पारी चाङग्रे डाँडा (खोङ्लुवा खोलाको जलाधार) सम्म । चाङग्रेबाट लगातार रूपले सीमा रेखा याचमखा र शिवदिङ गाउँदेखि उत्तर-तर्फ रहेको खोरिया आवादीको शिरानै शिरान हुँदै संखुवा खोला पारी धर्मशाला हुँदै केन्या खर्कको वतासे डाँडा (४५०० मि.) सम्म । केन्या खर्कबाट पश्चिम तर्फ झर्ने डाँडाको धार पछ्याउँदै मुवी खर्क मुनिपट्टि पर्ने होङ्गु खोलासम्म ।

आज्ञाले,

वचनप्रसाद कायस्थ

श्री ५ को सरकारको सचिव

श्री ५ को सरकार

वन तथा भू-संरक्षण मन्त्रालयको सूचना

श्री ५ को सरकारले राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण ऐन, २०२९ को दफा ३ को उपदफा (२) ले दिएको अधिकार प्रयोग गरी खण्ड ४१, संख्या ३१, मिति २०४८।८।२ को नेपाल राजपत्र भाग ३ मा प्रकाशित यस मन्त्रालयको सूचना २ ले घोषित गरेको मकालु वरुण संरक्षण क्षेत्र परित्याग गरी सोही ऐनको दफा ३क को उपदफा (१) ले दिएको अधिकार प्रयोग गरी सगरमाथा अञ्चलको सोलुखुम्बु जिल्ला र कोशी अञ्चलको संखुवासभा जिल्लाको देहायबमोजिमको चार किल्लाभित्रको क्षेत्रलाई "मकालु वरुण राष्ट्रिय निकुञ्ज मध्यवर्ती क्षेत्र" तोकेको छ।

पूर्व : अरुण खोलाको शिर (नेपाल चीनको अन्तर्राष्ट्रिय सिमाना) बाट शुरु भई अरुण खोले खोला हुँदै संखुवा खोला र अरुण खोलाको दोभानसम्म।

पश्चिम : होङ्गु खोला (बुङ्ग गाउँको फेदी) बाट बुङ्ग गाउँको पश्चिम पट्टिको डाँडाको धारै धार सुर्कोलासम्म। सुर्कोलाबाट चेरेम गाउँको सिरान हुँदै हिङ्कु खोलासम्म।

उत्तर : मकालु वरुण राष्ट्रिय निकुञ्जको दक्षिणी सिमाना।

दक्षिण : संखुवा खोला र अरुण खोलाको दोभानबाट पश्चिमतर्फ साउने डाँडाको शिरै शिर बुकुरखोलाको (होङ्गु खोलाको शाखा) सिरानसम्म। त्यहाँबाट बुकुरखोले खोला हुँदै होङ्गु र बुकुर खोलाको दोभान हुँदै दक्षिणतर्फ होङ्गु खोले खोला बुङ्गु गाउँको फेदीसम्म।

आज्ञाले,
रविशर्मा अर्याल
उप-सचिव कानून

श्री ५ को सरकार

भूमि सुधार तथा व्यवस्था मन्त्रालयको सूचना

श्री ५ को सरकारले खण्ड ४८, संख्या ६, मिति २०५५।२।११ को नेपाल राजपत्र भाग ३ मा प्रकाशित यस मन्त्रालयको सूचनामा उल्लेख गरिएको कम्पनीले पालना गर्नुपर्ने शर्तहरू मध्ये शर्त नं. १, २, ३ र ४ हरू पालना गर्ने अवधि एकपटकको लागि यो सूचना प्रकाशन भएको मितिले ३ महिनाको लागि थप गरेको छ।

आज्ञाले,
योद्धा शाह
श्री ५ को सरकारको निमित्त सचिव

(२)

Annex 12: Record of human casualties caused by Himalayan Black Bear in MBNP.

S.N.	Victim's Name	Address	Date	Place	Injury/ Death	Provided amount	Remarks
1	Bhim Prashad Rai	Bung-7	4/11/2069	Buffer Zone area Solukhumbu	Serious		No Record
2	Subba mani Rai	Cheskyam 4	7/25/2069	Cheskam, Solukhumbu	Serious	40,000	
3	Purna Dhani	Kulung, Cheskam 4	7/25/2069	Cheskam, Solukhumbu	Serious	40,000	
4	Sunita Kulung ,	cheskam-5	7/25/2069	Cheskam, Solukhumbu	Serious	40,000	
5	Nirmala Kulung,	Cheskam-5	7/25/2069	Cheskam, Solukhumbu	Serious	40,000	
6	Hira Prashad Rai,	Cheskam -7	5/11/2071	Bung Solukhumbu	Death	3,00,000	
7	Pasang Khuti	Sherpa, Yaphu-1	1/27/2072	Yaphu Sankhuwasava	Serious	32,500	
8	Suk Bdr. Rai,	Tamku-9	6/15/2072	Tamku-9 Sankhuwasava	Serious	40,000	
9	Prem Kumar Rai,	Tamku-9	6/11/2072	Tamku -9	Minor	10,000	
10	Jaye Bdr. Rai	Shisuwakhola-8	5/19/2072	Community Forest	Minor	10,000	
11	Samar Bdr. Rai,	Shisuwakhola-4	20726-1	Near own land	Serious	1,00,000	
12	Kuber Rai,	Shisuwakhola-8	5/19/2072	Near House land	Minor		No Record

13	Dharchi Phuti Sherpa,	Shisuwakhola -9	3/6/2073	Own Corn land	Minor	10,000	
14	Lakpa Dhiki Sherpa	Cheskam -3	4/14/2073	Cheskam -3 Baksuwar Solukhumbu	Minor		Under Process
15	Tilaraj Rai,	Cheskam-3,	1/7/2074	Cheskam-3, Solukhumbu	Serious		Under Process
16	Ngima Temba Sherpa,	Yaphu-9	5/8/2073	Cheskam, Solukhumbu			Under Process
17	Uttar Rai	Shisuwakhola-7	1/31/2074	Shisuwakhola-8 Bhalukhola	Serious		Under Process
18	Chandra Bahadur Gurung	Makalu-6	12/04/2074	Makalu-6	Serious		Under Process
19	Tula Ram Bista	Makalu-6	12/04/2074	Makalu-6	Serious		Under Process

Annex 13: Management Plan Review Team

SN	Name	Designation	Organization	Remarks
1	Mr. Shyam Bajimaya	Former Director General	DNPWC	
2	Mr. Gopal Prakash Bhattrai	Deputy Director General	DNPWC	
3	Mr. Sher Singh Thagunna	Deputy Director General	DNPWC	

Annex 14:List of research conducted in MBNP area

S.N.	Research Topic	Research Year	Organization	Researchers	Remarks
1	The Arun: A Natural History of the World's Deepest Valley	1979	Houghton Mifflin Co., Boston.	Cronin, E. W.,	
2	Mountain Environmental Management of the Arun River Basin of Nepal	1988	International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.	Dunsmore,J. R.,	
3	The Development Ecologyof theArun Basin in Nepal.	1989	International Centre for Integrated Mountain Development (ICIMOD),	Tirtha Bahadur Shrestha	

			Kathmandu, Nepal.		
4	Current Status of Nettle Fiber Exploitation in the Makalu-Barun Conservation Area and its Future Prospects	Undated		Shrestha R.,	
5	The Makalu-Barun Conservation Proiect: Soci- Economic Survev of the Conservation Area,	undated c1990		Banskota K., Sharma B., Upadhyay M.	
6	Tourism Management Component of the MBCP Management Plan	November 1990		Banskota K et al.,	
7	Park Management component of the MBCP Management Plan,	November 1990		Sherpa LN et al;	
8	Comrnunity Resource Management Component of the MBCP Management	November 1990		Nepali RK et al	
9	The Makalu-Bamn National Park and Conservation Area: Management Plan	November 1990	Makalu Barun Conservation Area Project (MBCP)		

10	Scientific Research Component of the MBCP Management Plan	November 1990		Shrestha TB et al	
11	The; Enhancing Natural Resource Management Sustainability and Biodiversitv in the Eastern Himalavs: The Scientific Research Progrma of the MBCP	May 1991	Mountain Institute,		
12	Feasibility Studv of Medicinal & Aromatic Plants in the Hativa V.D.C. of Sankhuwasabha District for Sustainalbe Management ,	1995	Makalu Barun Conservation Area Project (MBCP)	Amatya G,	
13	Post Fonnation Support to Forest User Groups: Sproposal for the MBNPCA Project Appriach,	1995	Makalu Barun Conservation Area Project (MBCP)	Valkeman G.;	
14	Rural Credit and Income Generation;	1995	Makalu Barun Conservation Area Project (MBCP)	Bhatt N.,	
15	Contribution to the Development of a Grazins	May to June, 1995	Makalu Barun Conservation Area Project	Valkeman G.;	

	Management Plan for the Park Area Between the Apsuwa Khol and Ipsuwa Khola.		(MBCP)		
16	Report of a Gield Trip to the Grazing Area between the Apsuwa Khola and the Ipsuwa Khola (Makalu Ward 8 & 9)	August 1995	Makalu Barun Conservation Area Project (MBCP)	Valkeman G.;	
17	Makalu-Bamn National Park and Conservation Area: 1995-96 Plan of Operation	December 1995			
18	Makalu-Barun: The Next Generation: Workshop Reports and Concept Papers from the Makalu-Bamn National Park and Conservation Area Pro-ject	December 1995	Makalu Barun Conservation Area Project (MBCP)		
19	Forest Ecology of the Makalu-Barun National Park and Conservation Area, Nepal	1996		Robert John Zomer and Chris Carpenter	
20	Historical and Contemporary	1996		A.C. Byers	

	Human Disturbance in the Upper Barun Valley, Makalu-BarunNational Park and Conservation Area, East Nepal.				
21	Survey of primates in Makalu-Barun Conservation Area (lower parts of Apsuwa, Isuwa and Sankhuwa river). A research report submitted to MBCA Project Nepal.	1997		Mukesh Kumar Chalise	
	Developing tourism strategy for Makalu-Barun National Park and Conservation Area, Nepal	1997	University of Edinburgh, UK	Gautam, K.C	
22	Landscape ecology of the Makalu Barun National Park and Conservation area.	1998	Department of Ecology, University of California. Ph.D.	Zomer, R. J.	
23	Some Behavioral and Ecological Aspects of Assamese Monkeys (Macaca	1999		Mukesh Kumar Chalise	

	assamensis) in Makalu-Barun Area,				
24	Ethonobotany of the of the Rai and the Sherpa communities in the Makalu-Barun Conservation area (MBCA), Eastern Nepal.M.Sc. Dissertiation	1999	Central Department of Botany, Tribhuvan University	Nepal, M.	
25	Species diversity of sal (*Shorea robusta* Gaertn.) forest on lower Arun river basin on MBNPBZ, eastern Nepal.	2000		Sharma Duwadee, N.P	
26	Behavior study of Assamese monkeys (Macaca assamensis) of Makalu-Barun Area,	2000		Mukesh Kumar Chalise	
27	Land Cover Change Along Tropical and Subtropical Riparian Corridors Within the Makalu Barun National Park and Conservation Area,	2001	Mountain Research and Development	Zomer R. J., Ustin S. L. & Carpenter C. C.	

	Nepal.				
28	Plant environment relationship in Makalu Barun region. In: Vegetation and Society: The Interaction in the Himalayas,	2002	Tribhuvan University Nepal and Unviversity of Bergen, Norway.	R.P. Chaudhary, B.P. Subedi, O.R. Vetaas and Tor. H. Aase Eds	
29	Management of community-based mountain tourism: Case study of Makalu-Barun National Park, Nepal.	2002		Sherpa, A.R.R.	
30	Linkage between biological and cultural diversity for participatory management: Nepal's experiences with Makalu-Barun National Park and buffer zone.	2003	J. Natn. Sci. Foundation, Sri Lanka,	Jha, S.G.	
31	Inventory of the three high altitude wetlands: Thulo Pokhari and Barun Pokhari wetlands of Makalu-Barun National Park.	2007	DNPWC and WWF	Center for Economic and Technological Development (CETED), Kathmandu, Nepal.	
33	Orchid flora of Makalu Barun National Park,	2008		Karkee, Dambar B.	

	Eastern Nepal				
34	Inventory of three high altitude wetlands: Sundaha Lake in Dhorpatan Hunting Reserve, Panch Pokhari in Makalu Barun National Park and Dudh Pokhari in Langtang National Park.	2009	DNPWC and WWF	Forum for natural resources Manager (FONAREM), Kathmandu, Nepal.	
35	Bat diversity hotspots and its conservation Implication in kangchenjunga Singhlila Complex and Makalu Barun Region of eastern Himalayan Nepal	20 September 2009 to 20 September 2010	WWF, Nepal Program	Mr. PushpaRaj Acharya	
36	Scientific field expedition on assessment of 11 glacial lakes of Hongu valley	0ctober 2009 to November 2009	University of Hokaido, Japan The Mountain Institute	Dr. Teiji Watanabe, Mr. Takanobu Sawagaki	
37	A study on the Ecological Behavioral and Conservation of Red panda in the Sacred Himalayan Landscape of Nepal	0ctober 2009 to November 2009	Red panda network , Nepal	Mr. Prabhat Pal, Mr. Arjun Thapa	

38	Assessing the Status of Clouded Leopard in Makalu - Barun National Park	October and November, 2009	Friends Of Nature	Mr. Yadav Ghimire, Mr. Binod Ghimire	
39	Assessing the status of small carnivores with a special focus on clouded leopard in Makalu-Barun National Park	2010	WWF, Nepal	Mr. Yadav Ghimire	
40	Status of felids in Makalu-Barun National Park, Nepal	2009 to 2010	Friends of Nature	Yadav Ghimire,Binod Ghimire, Prabhat pal, Vicky Koirala, Raju Acharya, Badri Vinod Dahal and Angie Appel	
41	Records of Siberian Weasel Mustela sibirica and Yellow-bellied Weasel M. kathiah from Makalu–Barun National Park, Nepal	2012	Small Carnivore Conservation	Ghimire.Y. & Acharya, R	
42	Glacial lakes of the Hinku and Hongu valleys, Makalu Barun National Park and Buffer Zone, Nepal	2013		Byers, A.C., McKinney, D.C., Valenzuela, M.S., Watanabe, T. & Lamsal, D	
43	Study of Red	2016/17	Red panda		

	Panda		network , Nepal		
44	Impacts of Yarsagumba Production, collection and distribution from MBNP	2018	MBNP	Jiwan Bahadur Khadka	
45	Monitoring and Study of Red Panda in MBNP	2018	MBNP	Himal Pathak	
46	Study of Musk Deer status in MBNP	2018	Makawanpur Forester's Society, Makawanpur, Nepal		
47	Study of Himalayan Black Bear status in MBNP	2018	Lumbini Environmental Services Pvt.Ltd. Shantinagar, Kathmandu		

Annex 15: Red Panda Sightings and Dropping spotted areas.

S.N.	Latitude	Longitude	Altitude	VDC	Sighting/ Dropping	Remarks
1	N27°38'36.63"	E87°15'56.85"	2442m	Makalu	Dropping	Limdumsa
2	N27°38'07.40"	E87°13'58.87"	2119m	Makalu	Dropping	Upper part of Tashigaun
3	N27°35'48.77"	E87°14'20.59"	2584m	Makalu	Dropping	West of Nurbu Gaun

4	N27°31'10.79"	E86°55'24.53"	3530 m	Cheskam	Dropping	
5	N27°31'6.52"	E86°54'34.78"	3680 m	Cheskam	Dropping	
6	N27°34'42.23"	E86°49'50.79"	3510 m	Bung	Dropping	
7	N27°34'57.71"	E86°50'8.99"	3540 m	Bung	Dropping	
8	N27°32'45.12"	E86°46'48.73"	2862 m	Bung	Dropping	
9	N27°32'36.15"	E86°46'53.51"	2956 m	Bung	Dropping	
10	N27°34'50.44"	E86°50'80.17"	3509 m	Bung	Sighting	Cholem
11				Bala	Sighting	Bakang
Bista *et al*, 2016 (MBNP)						

Government of Nepal

Ministry of Forest and Environment

Department of National Parks and Wildlife Conservation

Makalu Barun National Park Office

Seduwa, Sankhuwasabha