



SAGARMATHA NATIONAL PARK AND ITS BUFFER ZONE
MANAGEMENT PLAN
2016–2020



Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation
Sagarmatha National Park Office
Namche Bazaar, Solukhumbu, Nepal





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FOREWORD



Sagarmatha National Park was established in 1976 with the aim of conserving endangered wildlife species, majestic landscape and local culture of the Khumbu region. In recognition of its superlative natural phenomenon, the park was listed in the World Heritage Site in 1979. The area was opened to the foreigners since 1950. The region got popularity in global community, when Sir Edmund Hillary and Tenzing Norgay Sherpa first climbed the Mt. Everest in 1953. Since then the area has been receiving an increasing number of tourists every year. No doubt, tourism has contributed a lot to flourish the local economy. However, some management challenges have also evolved simultaneously.

The first management plan of SNP was prepared in 1981 with the view of managing the area systematically. The Plan was reviewed in 1993, and it was felt that it needs a revision, mainly to address the evolving socio-cultural and environmental issues together with the challenges. In this regard, DNPWC with the support from the UNDP/TRPAP prepared an integrated management and tourism plan for SNP for the period of 2007–2012. However, all the activities prescribed by the plan could not be implemented due to budget constraint, the integrated plan 2007-2012 served as a key guiding document for carrying out conservation and management activities in SNP and its BZ. With the aim of developing an updated plan as far as practicable, DNPWC assigned Mr. Ganesh Pant, Chief Conservation Officer, SNP to update and prepare a management plan for SNP and its BZ for another five years from 2016 to 2020.

This plan is an outcome of rigorous review of previous plans. The plan preparation process also involved intensive literature review, consultation with the stakeholders as well as expert review. I would like to extend my sincere thanks to the reviewers of this plan who provided valuable inputs on its draft. Mr. Ganesh Pant, Chief Conservation Officer, SNP deserves special appreciation for his tireless efforts in leading the process to update and prepare this plan. I would like to thank the DNPWC officials especially the Deputy Director General duo Mr. Gopal Prakash Bhattarai and Dr. Maheshwar Dhakal for their contribution to prepare this plan. I also take this opportunity to thank the Community-based Flood and Glacial Lake Outburst Risk Reduction Project/DHM for the financial assistance to update this plan. Last but not the least, I thank local communities living in Khumbu region including executive committee members of BZMC and BZUC for their continuous support in conservation of SNP.

I hope this plan will be helpful for the conservation and management of SNP and its BZ.

Man Bahadur Khadka
Director General



Government of Nepal
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Department of National Parks and Wildlife Conservation
Sagarmatha National Park Office

ACKNOWLEDGEMENTS



Sagarmatha National Park, a world heritage property since 1979, is an example of superlative and exceptional natural beauty, which is embedded in the vivid mountains, glaciers, deep valleys and majestic peaks including Sagarmatha (Mt. Everest), the world's highest peak. The park is home to several rare species of wildlife including snow leopard, musk deer and red panda. The area contains the world's highest ecologically characteristic flora and fauna, intricately blended with the rich Sherpa culture. The intricate linkages of the Sherpa culture with the ecosystem are a major focus of the park, and they form the basis for the sustainable conservation of the natural resources, which eventually contributes for the wellbeing of the local communities.

Management planning for any protected area is a dynamic process, and we must be prepared to accommodate the changes in the management based on new facts. In this regard, the management plan for SNP and its BZ for the period of 2016–2020 has given more emphasis on key wildlife and its habitat conservation as a response to the return of snow leopard in the SNP after more than three decades. Likewise, the plan attempts to address the issues associated with the likely impacts of climate change in order to safeguard the natural world heritage property from the vulnerability it faces at present. In addition, the plan intends to introduce cutting-edge technologies in regulating tourism activities as an effort for maintaining delicate balance between conservation and tourism development in the park.

First I would like to express my sincere gratitude to the Director General and the team at DNPWC for entrusting me with the task of reviewing and updating the management plan for SNP and its BZ for the period of 2016–2020. During the plan preparation process, various institutions, organizations and individuals provided their valuable inputs. In this regard, I would like to thank all the institutions and experts consulted as the key informants for their time and contribution. I would like to extend my sincere thanks to Mr. Gopal Prakash Bhattarai and Dr. Maheshwar Dhakal, Deputy Director Generals, DNPWC for their continuous support and inputs.

I highly acknowledge Mr. Saurav Shrestha for his untiring efforts in plan write-up, Mr. Nawaraj Chapagain for GIS map preparation and Mr. Laxman Prasad Paudyal, Ecologist, DNPWC for collecting primary information through local level consultation. Likewise, I thank Mr. Shahas Man Shrestha for his input in language editing. I am grateful to the distinguished participants of the central-level consultation meeting on the review of the management plan for the SNP and its BZ for the period 2016–2020 for their constructive comments and suggestions.

Finally, I would like to thank SNP staff together with the BZ Management Committee members as well as the BZ User Committee members, and the local communities for their valuable inputs.

Ganesh Pant
Chief Conservation Officer





नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग
(व्यवस्थापन शाखा)

फोन नं. : ४२२०२१६
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फ्याक्स नं. ४२२७६७५



संकेत नं. :-
पत्र संख्या :- ०७२।७३ व्य. नं. ४६८
चलानी नं. :- १९४४



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मिति :- २०७२।१२।२४

विषय :- सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०१६-२०२०) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृत गरिएको सम्बन्धमा ।

श्री सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय
नाम्चे, सोलुखुम्बु

प्रस्तुत विषयमा सगरमाथा राष्ट्रिय निकुञ्ज तथा त्यसको मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०१६-२०२०) र सोही व्यवस्थापन योजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृतिको लागि त्यस कार्यालयको पत्र संख्या २०७२।७३ च.नं. ७५३ मिति २०७२।१२।१९ को पत्रसाथ टिप्पणी सहितको फाईल पेश हुन आएको ।

उपरोक्तमा उल्लेखित विषयको टिप्पणी फाईलमाथि कारवाही हुँदा विश्व सम्पदा महासन्धीको मुख्यालयबाट हाल सम्म कुनै सुभाव प्राप्त नभएको तर १-२ महिना भित्र पठाउन सक्ने संकेत गरे अनुसार ताँहाबाट प्राप्त हुने सकारात्मक सुभावहरू प्राप्त भए पछि कार्यान्वयन गर्ने गरी पेश हुन आएको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन र सगरमाथा राष्ट्रिय निकुञ्ज तथा त्यसको मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०१६-२०२०) मिति २०७२।१२।२३ को विभागीय निर्णयानुसार स्वीकृत गरिएको हुँदा स्वीकृत प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन र सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०१६-२०२०) यसैसाथ राखी कार्यान्वयनको लागि पठाईएको व्यहोरा निर्णयानुसार अनुरोध छ ।

(विष्णु प्रसाद थपलिया)
सहायक व्यवस्थापन अधिकृत

वोधार्थः

श्री सगरमाथा राष्ट्रिय निकुञ्ज मध्यवर्ती क्षेत्र व्यवस्थापन समिति
नाम्चे, सोलुखुम्बु ।

EXECUTIVE SUMMARY

Sagarmatha National Park (SNP), established in 1976 is one of the pioneer protected areas of Nepal. The park was inscribed as world heritage property in 1979 because of its superlative and exceptional natural beauty, which is embedded in the vivid mountains, glaciers, deep valleys and majestic peaks including the world's highest peak, Mt. Everest. The Gokyo and the associated wetlands, the wetlands of global significance, also lie within Park. The park is a home to some of the endangered wildlife species including snow leopard, musk deer and red panda. The area contains the world's highest ecologically characteristic flora and fauna, intricately blended with the rich Sherpa culture. The Buffer zone, encompassing the major part of the Chaurikharka VDC to the south as well as the settlements within SNP traditionally considered as village enclaves, was created in 2002. There are nearly 7,800 people living in 1,619 households in buffer zone of the SNP. In order to institutionalize participatory conservation and development practices in the buffer zone, the local communities are organized into 28 Buffer Zone User Groups (BZUGs), three Buffer Zone User Committees (BZUCs) and one Buffer Zone Management Committee (BZMC).

SNP is one of the most popular tourist destinations in Nepal. Tourism is the major source of income, which not only benefits the local communities, but also generates significant amount of revenue for the country. SNP at present faces several challenges which need to be addressed 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 the local communities have been identified as the major issues of concern. This management plan is expected to address most of these pertinent issues.

The current Management Plan 2016–2020 is the continuation of the previous management plan of the SNP and its BZ developed through numerous interactions and consultation meetings with stakeholders, field works and observations, central and local-level workshops followed by expert review. The plan has been prepared for conservation, management and utilization of the park and its buffer zone resources in scientific and participatory approach with due consideration of its significance as the world heritage property. The objective of SNP and its BZ management is to enhance biodiversity of the park, promote tourism and regulate it where necessary to maintain delicate balance between conservation and tourism, and also support the livelihoods of the local communities through effective management of the natural and cultural 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 and processes;
- 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 and red panda. The plan also attempts to manage the park in the face of likely impacts of climate change in order to safeguard the Outstanding Universal Value (OUV) of the Park as well as to enhance the resilience of the local communities living in the BZ. The major programmes outlined in the management plan include park protection, habitat management, basic physical infrastructure construction, tourism promotion, community development, public awareness, monitoring, research and capacity building.

The total budget for the implementation of the plan is estimated to be Rs. 71,45,30,000 (equivalent to 65,55,321 US\$) excluding operation costs. The expected government budget of Rs. 19,50,00,000 (equivalent to 17,88,991 US\$) for the management of the BZ for the next five years has been included in this total budget. The implementation of the activities prescribed in this plan is expected to enhance the conservation of biodiversity in this region, maintain the OUV of the world heritage site, promote tourism for improvement of the living standard of the local communities, and enrich the capacity of SNP staff and BZ communities. On the other hand, it is estimated that 2,85,800 man days of employment will be generated in this region through implementation of the activities prescribed by the management plan which is expected to contribute for enhancing the livelihood of the local communities.

सारांश

सन् १९७६ (बि.सं. २०३३) मा स्थापना भएको सगरमाथा राष्ट्रिय निकुञ्ज नेपालको एउटा अग्रणी संरक्षित क्षेत्र हो। विश्वको सर्वोच्च शिखर सगरमाथा लगायतका सुन्दर हिमश्रृङ्खला, हिमनदी, मनोरम उपत्यका सहितको अनुपम प्राकृतिक सौन्दर्यताले भरिपूर्ण यो राष्ट्रिय निकुञ्ज सन् १९७९ मा विश्व सम्पदा सूचीमा सूचिकृत भएको छ। त्यसैगरी अन्तर्राष्ट्रिय महत्वको सिमसार क्षेत्रको रूपमा रामसार सूचीमा सूचिकृत गोक्थो तथा वरपरका तालहरू यस राष्ट्रिय निकुञ्ज क्षेत्रभित्र अवस्थित रहेको छ। यो राष्ट्रिय निकुञ्ज हिउँ चितुवा, कस्तुरी मृग, हाब्रे लगायतका दुर्लभ एवं महत्वपूर्ण वन्यजन्तुहरूको बासस्थान पनि हो। यस क्षेत्रमा विश्वकै अति उच्च पारिस्थितिकीय प्रणाली अन्तर्गतका जीव तथा वनस्पतिहरू पाइन्छन् जसको स्थानीय शेर्पा संस्कृतिसंग अन्योन्याश्रित सम्बन्ध रही आएको छ। सन् २००२ (बि.स. २०५८) मा चौरीखर्क गा.वि.स.को अधिकांश भू-भाग र निकुञ्जको चारकिल्लाभित्र अवस्थित मानव बस्तीहरू समेटेर सगरमाथा राष्ट्रिय निकुञ्जको मध्यवर्ती क्षेत्र घोषणा गरिएको छ। मध्यवर्ती क्षेत्रभित्र रहेका १,६१९ घरधुरीहरूमा करीब ७,८०० मानिसहरू बसोबास गर्दछन्। मध्यवर्ती क्षेत्रमा सहभागितामूलक संरक्षण र विकासको अभ्यासलाई संस्थागत गर्नको लागि स्थानीय समुदायलाई २८ वटा मध्यवर्ती क्षेत्र उपभोक्ता समूहहरूमा आवद्ध गरी तीनवटा मध्यवर्ती क्षेत्र उपभोक्ता समितिहरू र एउटा मध्यवर्ती क्षेत्र व्यवस्थापन समिति गठन गरिएको छ।

सगरमाथा राष्ट्रिय निकुञ्ज नेपालको एउटा प्रसिद्ध पर्यटकीय गन्तव्य हो। पर्यटन व्यवसाय यस क्षेत्रका स्थानीय समुदायको लागि आम्दानीको मुख्य स्रोत मात्र नभई राष्ट्रकै लागि उल्लेखनीय राजश्वको स्रोतको रूपमा रहेको छ। सगरमाथा राष्ट्रिय निकुञ्जमा जैविक विविधता संरक्षण, पर्यटन प्रवर्द्धन तथा स्थानीय समुदायको जिविकोपार्जनलाई सन्तुलित रूपमा अगाडि बढाउनको लागि विविध चुनौतिहरू विद्यमान रहेका छन्। उल्लेखित सन्दर्भमा निकुञ्जको संरक्षण, महत्वपूर्ण वन्यजन्तुहरूको बासस्थान व्यवस्थापन, दिगो पर्यटन प्रवर्द्धन, आवश्यक भौतिक पूर्वाधारहरूको विकास, फोहोरमैला व्यवस्थापन, हिमताल विष्फोटनको जोखिम तथा स्थानीय समुदायको जिविकोपार्जन सुधारलाई मुख्य सवालहरूको रूपमा पहिचान गरिएको छ। यस व्यवस्थापन योजनाले यी अधिकांश सवालहरूलाई सम्बोधन गर्ने अपेक्षा गरिएको छ।

सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको व्यवस्थापन योजना सन् २०१६-२०२० बिगतका व्यवस्थापन योजनाहरूको निरन्तरता हो जसलाई सरकारवालाहरूसंगको अन्तर्क्रिया, छलफल, स्थलगत अवलोकन, उपभोक्ता समिति स्तरीय बैठक समेतबाट तयार गरिएको मस्यौदालाई विज्ञहरूबाट पुनरावलोकन गराई अन्तिम रूप दिइएको छ। यो व्यवस्थापन योजना सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रमा रहेका स्रोतहरूको वैज्ञानिक एवं सहभागितामूलक पद्धतिबाट संरक्षण, व्यवस्थापन र दीगो उपयोग गर्नको लागि तयार गरिएको हो भने विश्व सम्पदाको रूपमा रहेको यो निकुञ्जको महत्वलाई समेत यो व्यवस्थापन योजनामा विशेष ध्यान दिइएको छ। सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्र व्यवस्थापनको मुख्य उद्देश्य यस क्षेत्रको प्राकृतिक तथा सांस्कृतिक सम्पदाको प्रभावकारी व्यवस्थापन मार्फत जैविक विविधता संरक्षण, संरक्षण र पर्यटनबीच सन्तुलन कायम राख्नको लागि पर्यटन व्यवसाय प्रवर्द्धन तथा नियमन गर्दै स्थानीय समुदायको जिविकोपार्जन सुधार गर्नमा टेवा पुऱ्याउनु रहेको छ। सगरमाथा राष्ट्रिय निकुञ्ज तथा यसको मध्यवर्ती क्षेत्रको व्यवस्थापन योजना २०१६-२०२० का निम्नानुसार चारवटा खास उद्देश्यहरू रहेका छन्।

- पारिस्थितिकीय कार्य तथा पद्धति कायम राख्नको लागि निकुञ्जमा पाइने संरक्षित एवं संकटापन्न वन्यजन्तु प्रजातिहरू तथा तिनीहरूको बासस्थानलाई विशेष ध्यान दिई जैविक विविधता संरक्षण गर्नु ।
- पारिस्थितिकीय अक्षुण्णता कायम गर्दै सांस्कृतिक सम्पदाको संरक्षण समेत हुनेगरी पर्यटन व्यवसाय प्रवर्द्धन तथा आवश्यकता अनुसार पर्यटन व्यवसायसंग सम्बन्धित क्रियाकलापहरू नियमन गर्नु ।
- जैविक विविधता संरक्षणमा स्थानीय समुदायलाई अभिप्रेरित गर्नको लागि मध्यवर्ती क्षेत्रका बासिन्दाहरूको संरक्षण सम्बन्धि सचेतना अभिवृद्धि तथा जिविकोपार्जन सुधार गर्नु ।
- अध्ययन अनुसन्धान, क्षमता अभिवृद्धि, समन्वय तथा सहकार्यको माध्यमबाट सगरमाथा राष्ट्रिय निकुञ्ज तथा मध्यवर्ती क्षेत्रको संस्थागत क्षमता अभिवृद्धि गर्नु ।

व्यवस्थापन योजनामा समावेश गरिएका मुख्य बिषयबस्तुहरूमा जैविक विविधता संरक्षण, बासस्थान व्यवस्थापन, पर्यटन तथा प्रकृतिको व्याख्यान, मध्यवर्ती क्षेत्रको व्यवस्थापन, अध्ययन अनुसन्धान, अनुगमन र क्षमता अभिवृद्धि रहेका छन् । त्यसैगरी हिउँ चितुवा, कस्तुरी मृग र हाब्रेलाई दृष्टिगत गरी प्रजाति संरक्षण विशेष कार्यक्रम तयार गरिएको छ । यस व्यवस्थापन योजनाले जलवायु परिवर्तनको प्रभावको सन्दर्भमा निकुञ्जको विशेष प्राकृतिक सौन्दर्य तथा महत्वमा पर्नसक्ने असर तथा मध्यवर्ती क्षेत्रका स्थानीय बासिन्दाहरूलाई पर्नसक्ने असर न्यूनिकरण गर्दै निकुञ्ज तथा मध्यवर्ती क्षेत्रको व्यवस्थापन गर्नको लागि समेत प्रयास गरेको छ । यस व्यवस्थापन योजनामा समाविष्ट मुख्य मुख्य कार्यक्रमहरूमा 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 बर्ष अबधिको लागि प्रस्ताव गरेका क्रियाकलापहरू कार्यान्वयन गर्नका लागि तलब भत्ता लगायतका प्रशासनिक खर्च बाहेक ७१ करोड ४५ लाख ३० हजार रुपैया (करीब ६५ लाख ५५ हजार ३२१ अमेरिकी डलर) आवश्यक पर्ने अनुमान गरिएको छ । यसमा आगामी पाँच बर्षमा मध्यवर्ती क्षेत्रको व्यवस्थापनको लागि प्राप्त हुन सक्ने सरकारी बजेट रु. १९ करोड ५० लाख रुपैया (करीब १७ लाख ८८ हजार ९९१ अमेरिकी डलर) समावेश गरिएको छ । यस व्यवस्थापन योजनाले प्रस्ताव गरेका क्रियाकलापहरू कार्यान्वयन भएमा सगरमाथा राष्ट्रिय निकुञ्ज तथा यसको मध्यवर्ती क्षेत्रको जैविक विविधता संरक्षण हुने, विश्व सम्पदाको रूपमा रहेको यस निकुञ्जको विशेष महत्व कायम रहने, स्थानीय बासिन्दाहरूको जिवनस्तर सुधार हुने गरी पर्यटन प्रवर्द्धन हुने साथै सगरमाथा राष्ट्रिय निकुञ्ज कार्यालयका कर्मचारीहरू तथा मध्यवर्ती क्षेत्रका समुह समितिहरूको संस्थागत क्षमता अभिवृद्धि हुने समेत अपेक्षा गरिएको छ । अर्कोतर्फ व्यवस्थापन योजना कार्यान्वयनबाट २,८५,८०० श्रमदिन रोजगारी सिर्जना हुने अनुमान गरिएको छ जसबाट स्थानीय समुदायको जिविकोपार्जन सुधारमा योगदान पुग्ने अपेक्षा गरिएको छ ।

ACRONYMS

°C	Degree Centigrade
AoR	Area of Responsibility
APPA	Appreciative Project Planning and Action
APU	Anti-poaching Unit
BZ	Buffer Zone
BZMC	Buffer Zone Management Committee
BZUC	Buffer Zone User Committee
BZUG	Buffer Zone User Group
CBAPO	Community-based Anti-poaching Operation
CFUG	Community Forest User Group
CITES	Convention on International Trade in Endangered species of Wild Flora and Fauna
DHM	Department of Hydrology and Meteorology
DLSO	District Livestock Service Office
DNPWC	Department of National Parks and Wildlife Conservation
E	East
ERFD	Eastern Regional Forestry Directorate
FY	Fiscal Year
GCA	Gaurishankar Conservation Area
GIS	Geographical Information System
GLOF	Glacial Lake Outburst Flood
gm	Gram
GoN	Government of Nepal
GPS	Global Positioning System
ha.	Hectare
HQ	Headquarters
HRD	Human Resource Development
ICIMOD	International Center for Integrated Mountain Development
IOF	Institute of Forestry
IT	Information Technology
IUCN	International Union for Conservation of Nature
KBC	Khumbu Bijuli Company
KCA	Kanchanjunga Conservation Area
kg	Kilogram
km	Kilometer
km ²	Square kilometer
LAC	Limit of Acceptable Change
LPG	Liquid Petroleum Gas
m	Meter
m ³	Cubic meter
MAPs	Medicinal and Aromatic Plants

MBNP	Makalu Barun National Park
MFSC	Ministry of Forests and Soil Conservation
mm	Millimeter
MSL	Mean Sea Level
Mt.	Mountain
N	North
NAST	Nepal Academy of Science and Technology
NGO	Non-governmental Organization
NMA	Nepal Mountaineering Association
No.	Number
NTFP	Non-timber Forest Product
NTNC	National Trust for Nature Conservation
OUV	Outstanding Universal Value
OVI	Objectively Verifiable Indicator
PA	Protected Area
PDNA	Post Disaster Need Assessment
QNP	Qomolangma Nature Preserve
Qty	Quantity
RIS	Ramsar Information Sheet
Rs.	Rupees
SAARC	South Asian Association for Regional Cooperation
SLIMS	Snow Leopard Information Management System
SMART	Spatial Monitoring and Reporting Tool
SN	Serial Number
SNP	Sagarmatha National Park
SPCC	Sagarmatha Pollution Control Committee
SPSS	Statistical Package for Social Sciences
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAR	Tibet Autonomous Region
ToT	Training of Trainer
TRPAP	Tourism for Rural Poverty Alleviation Programme
UC	User Committee
UG	User Group
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
VDC	Village Development Committee
WHC	World Heritage Convention
WHS	World Heritage Site
WWF	World Wide Fund for Nature

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SAGARMATHA NATIONAL PARK AND ITS BUFFER ZONE AT A GLANCE

Location	: Northern mountain of eastern Nepal
National Park Designation Year	: 19 July 1976 (04 Shrawan, 2033)
World Heritage Site Declaration	: 1979 (UNESCO)
IUCN Category	: II
National Park Area	: 1,148 km ²
Buffer Zone Gazetted Year	: 01 January, 2002 (17 Poush, 2058)
Buffer Zone Area	: 275 km ²
Buffer Zone District	: 1
Buffer Zone VDCs	: 3
Buffer Zone User Committees	: 3
Buffer Zone User Groups	: 28
Buffer Zone Households	: 1,619
Buffer Zone Population	: 7,745
Major Ethnic Group	: Sherpa
Major Religion	: Buddhism
Major Glaciers	: Khumbu, Imja, Ngozumpa, Nangpa
Ramsar Enlisted Site	: Gokyo and the associated wetlands
Major Rivers	: Dudh Koshi, Bhoté Koshi and Imja Khola
Major Peaks	: Sagarmatha (8,848 m), Lhotse (8,501 m), Cho Oyu (8,153 m), Nuptse (7,896 m)
Bioclimatic Zone	: Lower Temperate, Upper Temperate, Sub-alpine, Alpine and Nival
Climate	: Temperate to Arctic
Elevation Range	: 2,300 m to 8,848 m above MSL
Main Mammals	: Snow Leopard, Musk Deer and Red Panda
Major Trees	: Pine, Hemlock, Fir, Juniper and Birch
Annual Visitors	: 34,412 in the FY 2014/15
Annual Revenue	: Rs. 8,90,26,022 (US \$8,47,867) in the FY 2014/15



MANAGEMENT PLAN PREPARATION PROCESS

The Management Plan for SNP and its BZ (2016–2020) is the outcome of the team effort of the individuals representing various organizations and groups. It has been prepared in participatory approach on the basis of the format endorsed by the DNPWC. The plan is based on holistic approach and envisages bottom-up planning process. It has been prepared with the active involvement of the BZ communities, relevant government agencies, NGOs, technicians, social activists, tourism entrepreneurs, community organizations, and other stakeholders. The management plan preparation team was led by the Chief Conservation Officer of SNP to precede the plan formulation process. The team was responsible for coordinating and organizing consultation meetings for management planning as well as preparation of draft management plan for SNP and its BZ. In the course of plan preparation, the team not only went through numerous literature reviews, consultations, meetings, workshops, field works and observations but also collected primary data relevant for the management plan.

The management plan has been divided into two parts: Part A dealing with the existing situation and Part B mentioning about the proposed management. The preparation of the first part of the management plan involved gathering of suggestions and comments from the relevant stakeholders and their subsequent organizations in predesigned management plan format. On the other hand, buffer zone user committees prepared the second part with the facilitation of the park staff. A number of consultation meetings and interaction programmes were conducted at different areas during the course of the plan preparation process. In addition, numerous formal and informal meetings were held as per the requirements. Similarly, a central level sharing workshop was held amongst the officials from the relevant government agencies, conservation partners, donors, professionals, academicians and other stakeholders within the DNPWC premises. The workshop identified the key gaps in the plan, and provided valuable 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 to the concerned experts for reviewing. The comments, suggestions and constructive criticisms from the experts were subsequently incorporated in the final plan.

PART A

THE EXISTING SITUATION

Chapter I Introduction

1.1. Name, Location, Constitution and Extent

1.1.1. Name

Sagarmatha National Park and its Buffer Zone

1.1.2. Location

SNP and its BZ is situated in the northern mountains of eastern Nepal, which covers part of Solukhumbu district (see Figure 1). The Park is located between 27°45'-28°07'N latitudes and 86°28'-87°07'E longitudes.

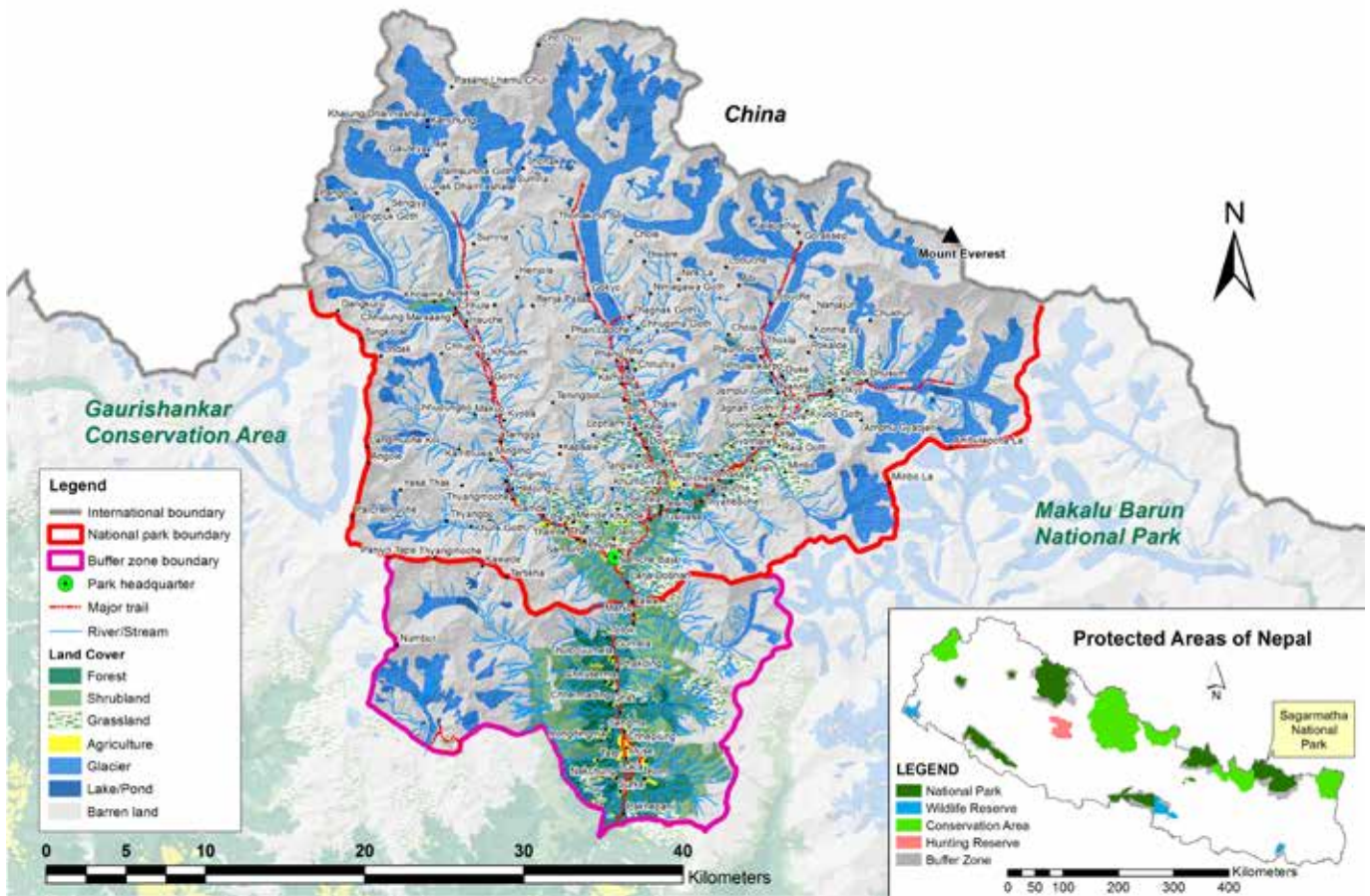


Figure 1: Location of Sagarmatha National Park and its Buffer Zone

1.1.3. Constitution and Extent

The area of SNP, designated in 1976, is 1,148 km² whereas the buffer zone, gazetted in 2002, extends over an area of 275 km². The core area of the National Park covers Namche and Khumjung VDCs as well as the northern part of the Chaurikharaka VDC whereas its buffer zone covers parts of Chaurikharka VDC and the village enclaves in Namche and Khumjung VDCs which are physically inside the National Park boundaries, but excluded from the National Park area.

1.2. Access

SNP is located in the northern part of Solukhumbu district, about 140 km east of Kathmandu City. The Park possesses only a limited number of access points. The main entry route lies in the Dudh Koshi Valley on its south. The majority of the visitors enter SNP first by flying up to the Lukla (Tenzing-Hillary) Airport located within the BJ, and then on foot. The second most used entry point is Nangpala Pass (5,716 m) located at the north-western part of SNP. This pass links SNP with Qomolangma

Nature Preserve in Tibet Autonomous Region (TAR) of China. The trans-himalayan traders use this pass, but it is prohibited for tourists. The Tashi Latse Pass links SNP with Rolwaling Valley on the west. This pass is used by a limited number of adventure trekking groups. Occasionally, trekkers and mountaineers cross the Ama Latse Pass at the head of the Imja Glacier that links SNP with Makalu-Barun National Park. Likewise, the BZ on the south can also be accessed through several passes that are not commonly used. The Zatarwa Pass above Lukla links the BZ with the Hinku Valley and the Mera Peak areas. There is also a rarely used route passing through Sengma and Tate villages, and links the BZ with the Upper Junbeshi Valley.

1.3. Statement of Significance

SNP is of high significance not only to Nepal but also to the whole world. Its status as a National Park has further elevated the international prestige and led to inscription of the area in the list of World Heritage Site (WHS) by the UNESCO for its outstanding universal value for aesthetic and scientific values. The Park was inscribed as a world heritage property in 1979 under the natural category of the UNESCO as it meets criterion (vii)- superlative natural features of exceptional natural beauty in terms of its scenic attractions of the forested hills, grasslands, great

rivers and views of the distant Himalayas. Besides, the UNESCO has also recognized the Park for the rich Sherpa culture.

SNP is an ecological unit in the highest region of the world; the area is of important scientific value, and offers unique research opportunities to scientists throughout the world because of its extreme elevation, associated flora and fauna, culture and environment. The high-altitude forests and rangeland environment of the Park are not only of aesthetic value but are vital to the local people of the area as a source of fuel and building material. The glaciers and rivers of the area are important source of water for the people downstream. Gokyo and associated wetlands, the wetlands of international significance, also lie within the Park. The wetlands, with a catchment area of 7,700 ha have been enlisted in Ramsar Site in 2007.

The park is of major religious and cultural significance in Nepal since it abounds in sacred mountains and holy places. The Sherpa people respect their homeland as a sacred hidden valley and refrain from hunting and slaughtering animals. These indigenous belief systems and practices provide important cultural basis for conservation. The Park has become an important destination for international visitors to Nepal.

Chapter II

Background Information and Attributes

2.1. Boundaries

2.1.1. Legal Boundaries

SNP was gazetted in 04 Shrawan, 2033 (19 July, 1976). The area of the Park is duly notified and demarcated on the ground. The boundaries of the Park as per the gazette notification of the Government of Nepal are as follows:

North: Lhotsesaar Himal, Sagarmatha (Mt. Everest), Nangpla Bhanjyang (Pass) through the Nepal-China (Tibet) border

East: Mingbola Bhanjyang (Pass), Aamphulapsa Bhanjyang (Pass), Chopol Himal and Lhotsesaar Himal

South: Mingbola Bhanjyang (Pass), Kangtaiga Himal, Tamaserku Himal and Pigpheragosaar through Kongderi Himal across the Luka-Namche Trail

West: Pigpheragosaar, Tashilapsa Bhanjyang (Pass), Tangiraagi Himal and Menlungla Bhanjyang (Pass)

The human settlements and the private lands that fall within the above mentioned boundaries, but legally excluded from the area of the National Park are Jorsalle, Taaboth, Ghumbada, Namche Bazaar, Sangboche, Khunde, Khumjung, Taasinga, Funkithanga, Tangboche, Deboche, Milingo, Thangboche, Taaboche, Mingbo, Raala, Samsho, Wogma, Surowog, Samsochopa, Suroteng, Tubonawogma, Sambur, Jongla, Dugla, Phulungkarpo, Dusa, Lobuche, Gorkchep, Pheriche, Dingboche, Saanja, Bibre, Chukung, Nayarajong, Phortse, Kinar, Thore, Somwog, Naala, Shosung, Gokyo, Longponga, Pangka, Machherama, Luja, Laphama, Dole, Gele, Tongba, Gongla, Mendo, Laaudo, Thamo, Thogde, Paare, Saamde, Thame, Thamegomba, Tengbo, Wotrse, Aarthe, Chule, Sonjo, Jimko, Lunaak and Nangpaighataya.

The buffer zone of the SNP was gazetted on 17 Poush 2058 (01 January, 2002). The enclave settlements and surrounding area of the Park has been declared as BZ. The area under the Chaurikharka VDC excluding the area included in the SNP and the MBNP was declared as BZ of the SNP. Likewise, the settlements which are located inside the SNP are legally excluded from the core area of the Park. The enclave settlements which are part of the BZ of the SNP are Jorsalle, Taaboth, Ghumbada, Namche Bazar, Sangboche, Khunde,

Khumjung, Taasinga, Funkithanga, Tangboche, Deboche, Milingo, Thangboche, Taaboche, Mingbo, Raala, Samsho, Wogma, Surowog, Samsochopa, Suroteng, Tubonawogma, Sambur, Jongla, Dugla, Phulungkarpo, Dusa, Lobuche, Gorkchep, Pheriche, Dingboche, Saanja, Bibre, Chukung, Nayarajong, Phortse, Kinar, Thore, Somwog, Naala, Shosung, Gokyo, Longponga, Pangka, Machherama, Luja, Laphama, Dole, Gele, Tongba, Gongla, Mendo, Laaudo, Thamo, Thogde, Paare, Saamde, Thame, Thamegomba, Tengbo, Wotrse, Aarthe, Chule, Sonjo, Jimko, Lunaak and Nangpaighataya.

2.1.2. Ecological Boundaries

SNP itself is an ecological unit in the highest region of the world. The Park and its buffer zone (1,423 km²) has landscape continuity with the Makalu Barun National Park and its buffer zone (2,330 km²) to the east, Qomolangma Nature Preserve (35,000 km²) in the TAR of China to the north and the Gaurishankar Conservation Area (2,179 km²) to the west. The combined area of the SNP, the MBNP, the QNP and the GCA is over 40,000 Km², which forms one of the largest protected area complexes in the high mountain ecosystem. SNP along with its surrounding landscape is, therefore, considered to be an ecologically inclusive.

2.2. Geology and Soil

The outstanding features of the Park are its majestic peaks higher than 8,000 m including Sagarmatha (8,848 m), Lhotse (8,501 m) and Cho Oyu (8,188 m). These magnificent mountain peaks have been uplifted by collision of the Eurasian and Indian continental plates about 120 million years ago. The process of continental collision is known to be continuing. As a result, the Himalayas are rising, although very slowly. The Himalayan peaks of the SNP are not only the highest but are among the youngest in the world. The young and steep landscape is subject to erosion and other changes, both gradual and sudden. The upper valleys of the Park are dominated by wider U-shaped valleys of glacial origin while the lower buffer zone area is marked mostly by the river-carved V-shaped valleys.

The soils of SNP and its BZ are mostly of glacial, fluvio-glacial and fluvial origin. Their development is highly influenced by climate that changes with elevation. Inceptisols are found within 2,000-3,000

m elevation; Inceptisols are young soils with slightly more advanced development with some leaching of the topsoil and weathering of the sub-soil. At around 3,000 m elevation, Spodosol may be found on stable sites under existing or previous coniferous and birch-rhododendron forests of cool sub-alpine zone. On the eroded slopes at higher elevations above 4,500 m, Entisols with a limited profile development, formed on fresh alluvial deposits or actively eroding rocks are common.

2.3. Topography and Drainage

The elevation of SNP and its BZ ranges from 2,300 m at Surke to 8,848m at the top of Sagarmatha. The terrain is steep and rugged and broken by the deep river gorges below while there are glaciers and glacial valleys at the upper reaches. The Park is drained north to south by two major rivers

viz. Bhote Koshi and Dudh Koshi along with their tributaries (see Figure 2 below). Dudh Koshi river is fed by three major glaciers including the Khumbu, the Ngozumpa, and the Imja. Bhote Koshi river is fed mainly by the Nangpa and the Chhule glaciers. There are altogether 28 rivers and streams flowing across the Park and its BZ. The Nangpa and the Imja are two main valleys that have a number of side-tributaries including the Gokyo, the Chunkung and the Khumbu glaciers on Dudh Koshi river, and the Thengpo and the Mingbo glaciers on Bhote Koshi river. The two major rivers meet at Larcha Dovan below Namche to form Dudh Koshi river. The Dudh Koshi river flows through the BZ for nearly 14 km before exiting the BZ below the Surke Village. A number of side streams of the Dudh Koshi river such as the Monjo Khola, Kusum Khola and Lumding Khola drain the rugged side slopes of the BZ.

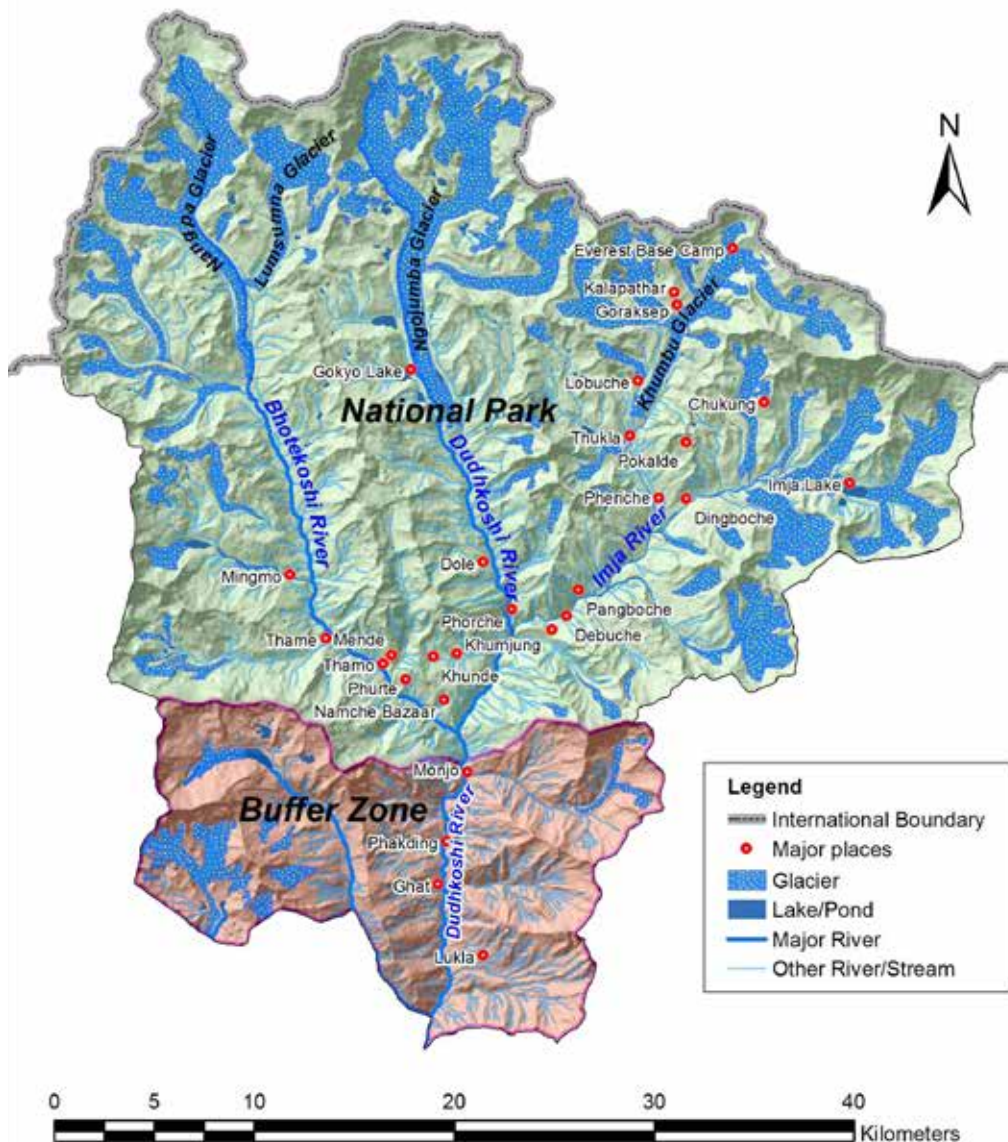


Figure 2: Drainage System of Sagarmatha National Park and its Buffer Zone

2.4. Climate

The climatic conditions of the SNP and its BZ are determined by the monsoon. In the summer months (July–August), the advancing summer monsoon cloud penetrates into the Dudh Koshi Valley carrying moisture. The moist-cloud is forced to lift by the increasingly higher mountain ranges as it advances northwards and precipitates. Seventy to eighty percent of the annual precipitation occurs in the summer (June–September) with the remainder of the year being relatively dry and cool. The relative humidity remains at 100% even in the upper valleys during the monsoon whereas the humidity rapidly decreases after the monsoon. The climate of the SNP and its BZ, therefore, can be described as generally moist and cool in the summer and cold and dry in the winter.

There are marked variations in the temperature and precipitation influenced by the altitude and seasons in the SNP and its BZ. The mid-summer (June–July) temperature recorded at the Thamo Village (3,400 m) is above 18°C while the minimum temperature falls to minus 6°C in January. Light snow begins to fall in the autumn, but the winter-snow accumulation rarely exceeds 1 m in the park, and less so in the lower buffer zone. Gale force winds are common in the higher elevation during the winter months. Most days from October to December remain bright with sunshine and clear blue sky.

The Upper Park area is slightly drier than its BZ as the Park is partially screened from the full force of monsoon by the Kongde and Tamskeru Ranges. To the north of the park lies the great Himalayan massif, which allows only a limited amount of moisture to cross its heights into Tibet. Towards the north, the QNP located on the rain shadow, has arid conditions with the annual rainfall of less than 150–200 mm.

2.5. Biodiversity Status

2.5.1. Vegetation

Forests occupy less than 10 % of the total area of the SNP and its BZ. Forest-cover is found mostly in the lower valley gorges below 3,500 m elevation, and is concentrated in the areas where farming, settlements, and grazing activities are difficult. Cool aspects and inaccessible areas retain more forest-cover as they are protected from fire and heavy harvesting pressure. The most common tree species are Himalayan blue pine (*Pinus wallichiana*) at the

altitude of 2,800–3,300 m followed by Himalayan Silver Fir (*Abies spectabilis*) at 3,000 m - 3,900 m elevation, and tree juniper (*Juniperus recurva*) in the drier slopes above 3500 m. Hemlock (*Tsuga dumosa*) is found in the lower valleys below 3,000 m. Intermixed with the large conifers are many broadleaved species such as birch, rhododendron, oak and maple. Birch-rhododendron forests are found between the altitudes of 3,600 m and 4,200 m, mostly on the cold slopes, sometimes mixed with firs.

The forests in SNP and its BZ are extensively used for extracting firewood, fodder, and non-timber forest products. The forests in the Park and its BZ are equally used for grazing livestock and harvesting tree fodder. Grazing seems to have a strong influence on the development of the forests in the Park and its BZ. Continuous grazing and burning can suppress the forest-regeneration, and turn the forest areas into grassy meadows again; when pressures ease, grassland can revert to forests again. However, the selective harvesting of large trees for timber has made the forests increasingly younger. Periodic-fires play an important role in forest structure. Some forest patches in the SNP and its BZ are controlled and protected by the local communities, but planting tree-saplings is not a part of the traditional forest management system in the SNP and its BZ. Reforestation has been in practice since 1988 from the support of the Himalayan Trust, and later promoted by various international organizations in cooperation with the BZ-CFUGs.

Much of the upper elevation landscapes between 3,500 m and 5,000 m altitudes are dominated by shrubs and grass. The dominant shrub species include dwarf juniper (*Juniperus wallichiana*) and rhododendron species (*R. anthopogon*, *R. lepidotum*, *R. setosum* and *R. nivale*), which generally occur above 3,500 m and mostly on, cool aspects. *Myricaria rosea*, *Hippophae thibetana* and *Salix spp.* are found along the streams. The snow rhododendron (*R. nivale*) extends up to 5,000 m. These landscapes are used primarily for livestock grazing and collecting fodder, wild foods, and medicinal and aromatic plants. Livestock-dung is collected from the shrub and grassland areas, and is an important source of organic-manure and fuel. The alpine areas are also becoming increasingly important for tourism. The traditional herding camps (chhu sa) are now being developed in some tourist villages, leading to pressure on the alpine vegetation resources.

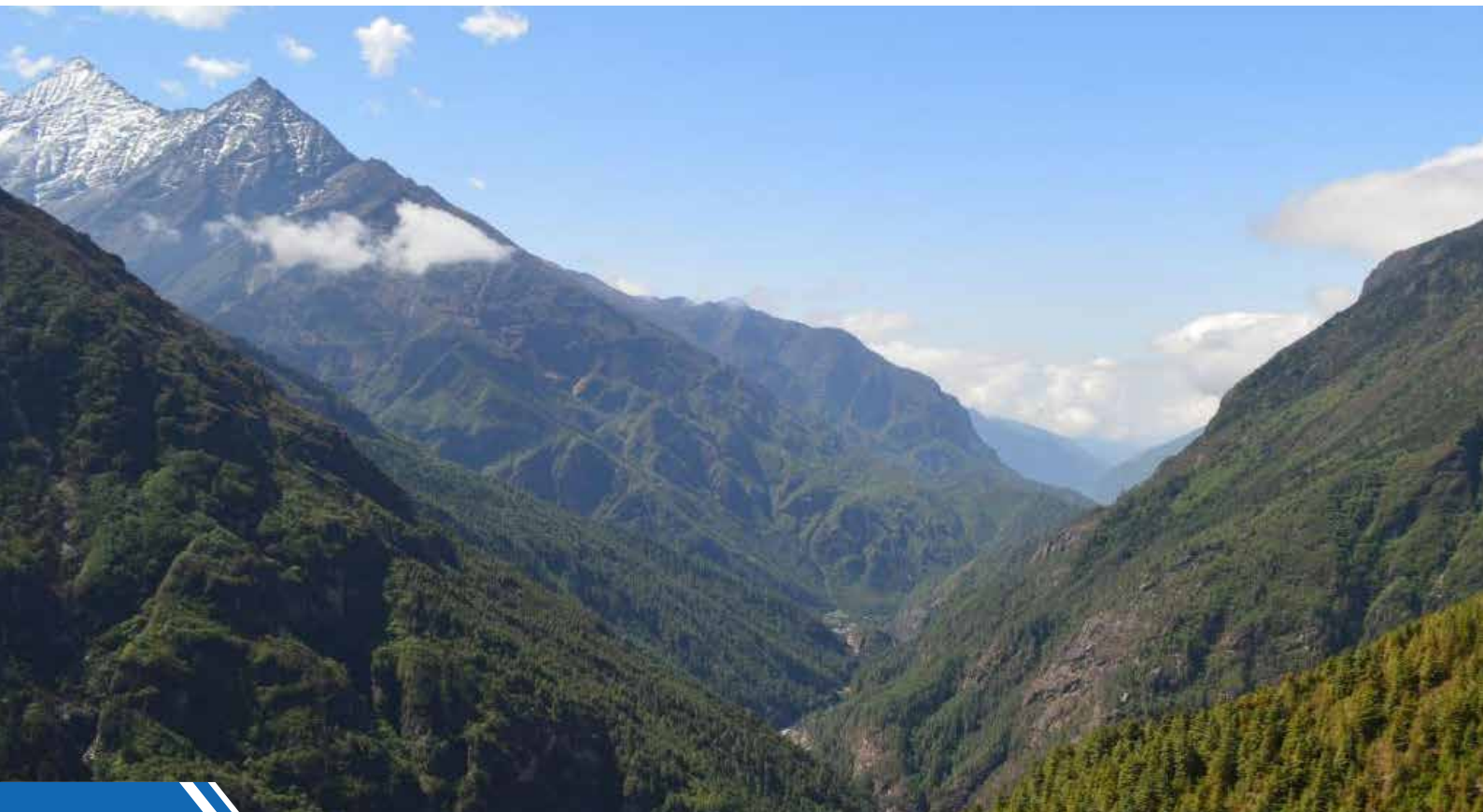
The diverse topography and steep slopes provide a wide range of habitats for many plant and animal species. The terrestrial habitat can be divided into a variety of ecological zones and ecosystem types such as temperate mixed-forests, sub-alpine conifer forests, broadleaved forests, alpine shrubs, grasslands and nival zone. The different forests and rangeland ecosystems support different plants and animal species. So far, a total of 865 species of plants have been recorded. Of these, 62 species are MAPs belonging to 47 genera and 33 families. Six species of MAPs are included under the threatened and protected list of the IUCN, four species belonging to the GoN Protected Category and four species under the CITES appendix II (Gaire, 2006). A study in the SNP and its BZ has recorded 150 mushroom species belonging to 37 families and 65 genera from Lukla (2,480 m above msl) to Pangboche (4,000 m above msl) (Rana and Giri, 2006).

2.5.2. Wildlife

SNP and its BZ are rich in floral and faunal diversity owing to its diverse ecological conditions ranging from almost temperate to nival zones. The sub-alpine zone exhibits a higher number of species followed by the lower alpine and temperate zones. The water bodies have cold temperatures and low nutrient contents. This prevents the high-elevation lakes, streams and rivers from supporting a high diversity of aquatic life. Nevertheless,

these ecological zones have become important resting sites and habitats for a significant number of migratory and some resident water birds. The high-altitude flora and fauna are important for global biological diversity as there are very few other places where life exists at such unique high altitudes.

SNP has a comparatively low number of mammalian species as a result of the recent origin of the Himalayas and climatic factors. The main mammals found are snow leopard (*Panthera uncia*), Himalayan musk deer (*Moschus chrysogaster*), Himalayan black bear (*Selenarctos thibetanus*), red panda (*Ailurus fulgens*), Himalayan tahr (*Hemitragus jemlahicus*) and wolf (*Canis lupus*). Many of these mammals are listed as endangered or threatened species. In addition to this, 8 species of reptiles, 7 species of amphibians and 30 species of butterflies have been recorded in the area. The park provides habitat for at least 194 species of birds (Basnet, 2004) including Danphe (*Lophophorus impejanus*), blood pheasant (*Ithaginis cruentus*), yellow-billed chough (*Pyrrhocorax graculus*) and Himalayan griffon (*Gyps himalayensis*). Out of the 194 bird species recorded in the SNP, 14 are globally significant. The lists of wild animals, wild birds and Herpetofauna recorded in the SNP and its BZ are presented in Annexes II, III and IV, respectively.



Chapter III

Past Management and Present Practices

3.1. Conservation History

The first official commitment to establish the Khumbu Region as a National Park was made by the then Prince Gyanendra at a meeting of the WWF in Bonn, Germany in 1973. A feasibility study for setting up of the park began in 1974 and the groundwork for establishing the Park was initiated in 1975 with technical assistance from the Government of New Zealand. The Mendalpu Hill above the Namche Bazaar was selected as site for the Park Headquarters. Construction of facilities

such as office buildings, staff quarters and outlying guard posts began soon after. The formal declaration of the 1,148 km² Park took place in June 1976 by announcing its boundaries in the Nepal Gazette. The Himalayan National Park Regulations was introduced in 1979 to provide the legal framework for managing the SNP and other mountain national parks. At the same time, the process of preparing a management plan for the Park was initiated. The Park was inscribed in the UNESCO's World Heritage Site in 1979 (DNPWC, 2007). The historical summary of the SNP is presented in Table 1 below:

Table 1: Historical summary of Sagarmatha National Park

Year	Major Events/Activities
1950	Everest region opened for tourism
1953	Sir Edmund Hillary and Tenzing Sherpa climbed the Summit of Mount Everest
1974	Feasibility study for the establishment of the Park
1975	Initiation of ground work for the establishment of the Park
1976	The SNP established with an area of 1,148 km ²
1979	The SNP designated as the World Heritage Site
1981	First management plan for the Park prepared
1993	First management plan for the Park reviewed
2002	BZ of the SNP declared
2004	Management Plan for the BZ of the SNP prepared
2007	Gokyo and the associated lakes declared as Ramsar Site Management and Tourism Plan for the SNP (2007–2012) prepared and implemented

Sources: DNPWC, 2007; Garratt, 1981

3.2. Park Protection

The illegal activities inside the SNP were prohibited since its establishment in 1976. Regular patrolling effort from the security posts established in the Park was the major activity to ensure the protection of the Park. At the beginning, a unit of the Nepal Army with the strength of 40 individuals was deployed in the Park, and later one company of the Army has been deployed to protect the wildlife species and their habitats in the Park and its BZ. The list of the existing Security Posts in the SNP and its BZ is presented in Annex V.

The protection of the Park has resulted in the increase in wildlife population. The return of snow

leopard in the SNP after almost four decades is an indicator of an effective park management, especially park protection after its establishment. Poaching of musk deer for illegal trade of its musk pod has remained one of the major challenges for the Park management.

3.3. Habitat Management

In order to maintain mosaic of suitable habitat in the Park, management of rangelands and wetlands has been in practice as habitat management intervention. The main focus of habitat management in the SNP has been to keep rangelands free from anthropogenic pressure such as unsystematic collection of forest products from

the Park and unregulated grazing in the rangelands within the Park. The previous plan of the SNP has recommended park zonation to reconcile the conservation needs and fulfillment of the basic requirements of the local communities. However, this could not be fully implemented. On the other hand, garbage management is another important activity under the habit management which not only helps in keeping rangeland and other wildlife habitat clean but also helps in controlling pollution in the wetlands. However, there is always a risk of forest fire as a threat to the wildlife habitats as frequent accidental fire deteriorates the wildlife habitats in the Park.

3.4. Anti-poaching and Intelligence Gathering

Intelligence gathering is the first step towards an effective anti-poaching operation. However, the park at present does not have a network of informants for intelligence gathering. In order to control poaching of wildlife species and illegal trade of their body parts, there is a need of informants' network to collect reliable information regarding the probable wildlife crimes in this area. There were several legal cases filed in the SNP based on the information provided by the local volunteers. Thus, there is a need to form and strengthen informants' network to obtain reliable information for effective anti-poaching operations.

3.5. Tourism and Interpretation

The SNP is one of the most popular tourist destinations in Nepal. Tourism is the major source of income, which not only benefits the local communities, but also generates significant amount of revenue for the country. Mountaineering and trekking are the major attractions for the visitors in the Everest region. Proximity to the Mt. Everest is a prime factor in the area's popularity. In 1963, 20 tourists visited the Everest region whereas the number of tourists increased to 3,500 in 1973. In 1980, there were 6,000 tourists. In 2000, the number of tourists who visited the Park peaked at 26,500. However, the number of visitors dropped to 14,000 in 2002 due to political instability in the nation. With improved political situation in 2004, the number of tourists increased to 21,000, and there are slightly more than 30,000 tourists visiting the Park annually in the recent years.

Garbage management is a major challenge in the Park area. In 1988, the Park authority initiated garbage management in Topdanda and Tengboche

areas of the Park through garbage pit construction. Later in 1991, a non-governmental organization, Sagarmatha Pollution Control Committee (SPCC) dedicated to garbage management in the Khumbu region was established and the Park authority has been promoting the SPCC as a local-level conservation partner to keep the Everest region clean. It is a local environmental institution, and has been actively engaged in waste management in the three VDCs viz. Chaurikharka, Namche and Khumjung of the SNP and its BZ. The Ministry of Tourism and Civil Aviation also coordinates with the SPCC to respond for monitoring garbage in the permit-required mountains and the NMA-registered peaks. In direct coordination with the SNP and the local communities, SPCC also manages garbage in the major settlements and along the trekking-trails. This NGO, with permission from the SNP, built some solid waste containers along some trekking-routes (Lukla to Namche, Namche to Tengboche and Namche to Thame).

3.6. Research and Monitoring

SNP is among well studied mountain PAs as it has received more attentions from both the national as well as international researchers compared to other mountain PAs in Nepal. However, most of the research results are scattered and results of many research works are not even known to the Park Manager. There is a very limited infrastructure for research in the Park as there are no permanent research stations in the Park except the Ev-K2-CNR/NAST Pyramid Research Laboratory.

3.7 Human-Wildlife Conflict

Human-wildlife conflict is not a pronounced issue in the Park and its BZ. However, there are few reported cases of wildlife damage recorded in the buffer zone. Crop depredation by Himalayan tahr is a management issue in the buffer zone over the period. The Sherpa culture of the Khumbu region is beneficial for wildlife conservation as they believe in non-violence religious value. Thus, killing of wildlife species by the local people is not a common practice in this region. However, crop depredation by Himalayan tahr and livestock killing by leopard are frequently reported. In the recent years, human-wildlife conflict is becoming one of the major hindering factors for maintaining harmonious relationship between the wildlife and the local people and increasing people's participation in conservation.

3.8 Administration and Organization

The Chief Conservation Officer (Gazetted Class II Officer) heads the SNP administration with the Headquarters at Namche, Solukhumbu. The organizational structure of the Park is presented in Figure 3 below:

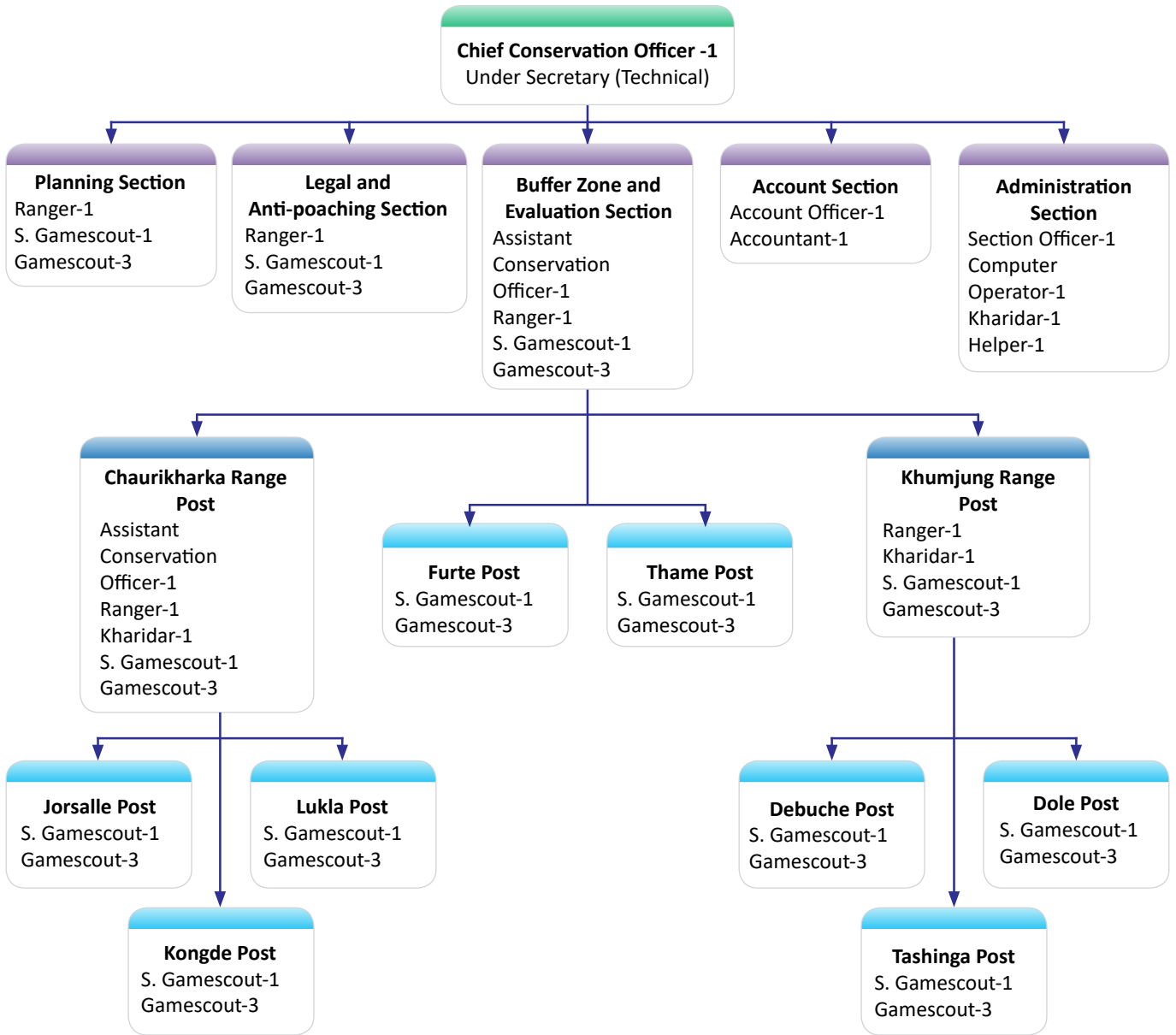


Figure 3: Existing organizational structure of Sagarmatha National Park

In addition to the regular management activities, a company of Nepal Army has been deployed for ensuring the protection of the Park. The company, headed by a Major, has its Headquarters at Namche, and there are altogether 3 security posts (at Namche, Thame and Lukla) in operation at present for the security of the Park and its BZ. The number of security posts can be increased as per the need considering the emerging issues and challenges of the Park management. The existing organizational composition of the staff in the SNP is presented in Annex VII.

3.9 Achievements of Preceding Management Plan

An integrated management and tourism plan was prepared and implemented in the SNP and its BZ for the period of 2007–2012. It consisted of 3-pillared structure of management, viz. i) Park Management, ii) Tourism Management and iii) Buffer Zone Management. A number of achievements have been made with the implementation of the plan particularly in the protection of the endangered species and the conservation and management of the natural resources.



3.10 Strength, Weakness, Opportunity and Threat (SWOT) Analysis

3.10.1 Strengths

- Natural world heritage property which draws attention of the global community as well for its conservation;
- Renowned destination for mountaineering-based tourism;
- Substantial revenue from tourism which has been recycled for conservation and development through buffer zone; and
- Encouraging partnership with local communities and stakeholders, including national and global conservation organizations.

3.10.2 Weaknesses

- Site-specific tourism and issues regarding equitable tourism benefits;
- Limited access to the Park;
- Resource dependency of the local people; and

- Inadequate number of staff for execution of daily and emergency activities.

3.10.3 Opportunities

- Diversification of eco-tourism and involvement of the local people in such enterprises;
- Opportunities for research through collaboration at different levels;
- Potential for self sufficiency of the resources required for conservation from ecotourism.

3.10.4 Threats

- Poaching continues to be a threat as market value for illegal wildlife parts exists;
- 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.

PART B

THE PROPOSED MANAGEMENT



Chapter IV

Vision, Goal and Objectives

4.1 Vision Statement

Sagarmatha National Park along with its Buffer Zone is visualized as **an area of representative example of biodiversity in the highest point of the world which is managed to enhance the unique 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

The goal of Sagarmatha National Park and its Buffer Zone management is **to conserve and maintain the biological and cultural values, and scenic beauty of the Park's landscape 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 in a manner that maintains ecological integrity.**

4.3 Management Objectives

The main objective of Sagarmatha National Park and its Buffer Zone management is to enhance biodiversity of the Park, promote ecotourism and regulate it where necessary to maintain delicate balance between conservation and tourism needs and also support the livelihoods of the local community through effective management of natural and cultural heritage. The specific objectives are:

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

4.4 Problems in achieving Objectives

There are several problems in achieving future desired condition of the Park. Some of the problems that may hinder to attain the above-mentioned objectives are as follows:

Objective 1

To conserve biodiversity with special focus on nationally protected and globally threatened wildlife species and their habitats in order to maintain ecological functions and processes.

- Poaching of musk deer for illegal trade of musk pod;
- Biotic pressure from tourism activities in certain areas of the Park that obstructs maintaining inviolate-area for snow leopard and other wildlife species;
- Inadequate ecological information;
- Inadequacy of infrastructure and limited budget for its maintenance;
- Inadequate trans-boundary cooperation with the TAR of China;
- Inadequate budget for carrying out the protection-activities of the Park;
- Inadequacy of linkages between research findings and management;
- Remoteness and limited accessibility to the Park;
- Harsh climatic condition that hinders staff mobility for patrolling of the Park;
- Inadequate number of staff and capacity;
- Unregulated grazing in the Park and its BZ;
- Traditional resource-dependency of the people living in the village enclaves inside and around the Park;
- Glacial retreat as an impact of climate change; and
- Inadequate research, monitoring and baseline data on hydrological functions.

Objective 2

To promote sustainable tourism and regulate it for maintaining ecological integrity and cultural heritage.

- Concentrated and unregulated tourism activities in the Park;

- Tourism opportunities not adequately explored in the Buffer Zone;
- Tourism infrastructure not planned well;
- Increasing demands for new tourism activities such as mountain biking, sky-gliding and marathon events;
- Increased disturbance to the wildlife species and their habitats from tourism;
- Lack of separate unit and dedicated staff to look after tourism management;
- Lack of tourism policy to deal with the concentrated tourism inflows in few areas; and
- Inadequate mechanism to manage crowd and garbage.

Objective 3

To enhance community stewardship on biodiversity conservation by increasing awareness and improving livelihood of the local people.

- Inadequate conservation awareness programme and illiteracy of the people living around Park;
- Crop damage and livestock depredation by wild animals;
- Inadequate livelihood opportunities for the local people living in the off-route settlements;

- Release of budget for buffer zone program generally not in time;
- Free grazing and dependency of the local people in the Park for resources; and
- Increasing populations of predators and prey.

Objective 4

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

- Inadequate collaboration with the concerned universities and research institutions;
- Lack of plan for continuation of research activities as well as initiation of new research;
- Lack of research prioritization;
- Inadequate linkages between research and management needs;
- Limited budget for ecological monitoring and research;
- Lack of adaptive management;
- Lack of clear policy for Human Resource Development (HRD);
- Insufficient incentives, rewards, amenities and welfare for staff motivation.



Chapter V

Management Strategies

5.1. Boundaries

5.1.1. Legal

Sagarmatha National Park (1,148 km²) and its Buffer Zone (275 km²) was declared according to the National Parks and Wildlife Conservation Act, 1973. The boundaries of Sagarmatha National Park and its Buffer Zone is well defined and duly notified with the publication in Nepal Gazette. The area of the Park is well demarcated on ground with natural features such as rivers, ridges and other land features. The land in the periphery of the Park as well as the village enclaves inside the National Park comprises the buffer zone.

5.1.2. Administrative

The core area of SNP lies within Namche and Khumjung VDCs as well as the northern part of Chaurikharka VDC of the Solukhumbu district. There are several village enclaves inside the National Park Boundary but these settlements are excluded from the National Park.

5.1.3. Ecological

SNP itself is an ecological unit in the highest region of the world. The Park and its Buffer Zone (1,423 km²) has a landscape continuity with the Makalu Barun National Park and its Buffer Zone (2,330 km²) on the east, Qomolangma Nature

Preserve (35,000 km²) in Tibet on the north and the Gaurishankar Conservation Area (2,179 km²) on the west. The combined area of the SNP, MBNP, QNP and GCA is over 40,000 Km², which forms one of the largest protected area complexes in the high mountain ecosystem. Therefore, SNP along with the surrounding landscape is considered to be ecologically inclusive and needs cooperation between Nepal and China to conserve biodiversity at trans-boundary landscape-level.

5.2. Zonation

SNP does not have an effective land use zoning system in place. The enclave settlements are not zoned and mapped, creating difficulty in protecting public lands. Similarly, there is a lack of policies or zoning system for development of tourism infrastructure in the Park. In order to harmonize the conflicting objectives and maximize the efforts to protect, maintain and enhance the wildlife habitats as well as the management of visitors in the sensitive environment in effective way, the following zones have been proposed:

5.2.1. Management Facility Zone

This is the zone inside the Park occupied by the infrastructures developed for office and accommodation for the Park staff and army personnel. It comprises the area occupied by security and the Park posts (Army and National Park) established and operated in the Park.



5.2.2. 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. There are few tourism infrastructures developed inside the Park, including the visitor center and museum at Namche. The main objective of managing this zone is to regulate tourism in the core area to minimize the disturbance to the wildlife species and their habitats and to enhance visitors' satisfaction through providing wilderness experience.

5.2.3. Core Zone

The area of the National Park except the area allocated for management facilities, tourism routes and public right for way, falls under the Core Zone (see also Table 2 below). The key objective of this zone is to provide the suitable habitats for wildlife and to encourage research and science-based management intervention.

Table 2: Management Zones of Sagarmatha National Park

SN	Name of the Zone	Brief description of the zone
1	Management Facility Zone	Area occupied by the infrastructure developed for the management of the Park
2	Utility Zone	Facilities developed for regulated tourism and public right for way
3	Core Zone	Area of the national park except the area occupied by management facilities, tourism routes and public right for way

5.3. Theme Plans

Of the five broad thematic areas, two thematic areas, viz. i) park protection and conservation of biodiversity, and ii) habitat management have been covered in this chapter. The remaining three have been dealt in separate chapters.

5.3.1. Protection and Conservation of Biodiversity

5.3.1.1. Park Protection

5.3.1.1.1. Context and Issues

SNP has witnessed several challenges in its history of four decades in park protection. The concept of protection was started with the establishment of the

SNP in 1976 whereas the Government has deployed Nepalese Army for park protection. There are park security posts (National Park, Army and combined) in 9 different locations in the core and the buffer zone of the Park. Park security is regarded as a pre-requisite for the successful management of the SNP as control of illegal activities is mandatory before taking any management intervention. Therefore, emphasis has been given on strengthening the park protection system through a good network of strategically located park security posts, improved basic facilities at security posts, effective and reliable communication facilities and dedicated staff for regular patrolling of the Park.



5.3.1.1.2. Activities

In order to ensure protection of the Park, regular patrolling of the Park is essential as there is no shortcut to 'Boots on ground' for effective protection of the Park. Thus, the plan suggests the strengthening of existing practices related to park patrolling. The following strategies and activities have been recommended to enhance the effectiveness of park protection:

- Establish five security posts (at Jorsalle, Chheplung, Kongde, Phungithanga and Dole) to cover the gap areas and define and demarcate the Area of Responsibility (AoR) of each security post;
- Continue regular patrolling of the Park by the Park Staff and the Army deployed in the Park Security Posts to ensure that there are no illegal activities in their respective AoR;
- Maintain regular foot patrolling in the accessible areas, and change the time and route of patrolling randomly;
- Sweep the area from the respective posts once in a month, and carefully observe for the trap set for musk deer and other wildlife species;
- Conduct camping and sweeping operation by a joint team from the Headquarters once in three months;
- Provide field-gear and equipment suitable for the operation in the high-altitude areas;
- Initiate the use of cutting-edge technologies such as Conservation Drone to monitor key species and their habitat in the park; and
- Initiate real time SMART patrolling in the SNP.

5.3.1.2. Anti-poaching and Intelligence Gathering

5.3.1.2.1. Context and Issues

Poaching of musk deer is one of the serious issues of concern for SNP management. Likewise, likelihood of retaliatory killing or poaching of snow leopard and other wildlife species in the SNP and its BZ could not be ignored. However, the Park does not have a network of informants for intelligence gathering at present. Thus, there is a need of developing a network of informants and strengthening their capacity for regularly gathering intelligence as well as keeping eye on the suspicious persons and their activities.

5.3.1.2.2. Activities

- Form and institutionalize Anti-poaching Unit (APU) and intelligence network;

- Initiate long-term surveillance of the suspicious persons, areas and their activities;
- Institutionalize Community-based Anti-poaching Operation (CBAPO);
- Build capacity of informants to ensure that our approach of intelligence gathering is not detrimental;
- Encourage and mobilize eco-clubs, students and local clubs against poaching and other illegal activities; and
- Strengthen trans-boundary cooperation with the TAR of China.

5.3.1.3. Wildlife Health Management

5.3.1.3.1. Context and Issues

Frequent interaction between the wild animals and the domestic livestock is obvious while sharing the same rangelands or waterholes by both as there are a number of villages in and around the Park. Besides, the 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 the livestock to the wild animals and vice versa, health monitoring and surveillance for the wild animal diseases should be done regularly. Besides, regular and timely immunization of the domestic livestock around the Park against the major diseases is needed to prevent disease outbreak.



5.3.1.3.2. Activities

Since medical treatment of the free-ranging animals requires lots of investments and is not possible in many cases, it would be wise to give emphasis on preventive measures. The strategies to be followed for wildlife health management in the SNP are:

- Immunize livestock against endemic diseases within the enclave settlements and in the buffer zone;

- Coordinate with District Livestock Service Office (DLSO) and seek their support whenever required;
- Support to establish a community based veterinary center with materials required in medical emergencies;
- Build the capacity of frontline staff to recognize, record and report disease or poor health condition of the wild animals or plants;
- Report and document mortality of the wild animals immediately after they come to notice to any staff as part of disease surveillance strategy; and
- Initiate the postmortem of the dead wild animals with the support from veterinary office.

5.3.2. Habitat Management

5.3.2.1. Rangeland Management

5.3.2.1.1. Context and Issues

Rangelands contain a wide diversity of grasses and other plant species on which a number of endangered wildlife species depend. Rangelands at high elevation areas are considered to be overgrazed but very little is known about the ecology and sustainability of the existing practices (ICIMOD, 2000). The rangelands in and around the SNP are homes to a diverse array of wildlife and are grazed by livestock, which are an integral part of the livelihood of the local communities. Sustainable management of the rangeland ecosystems has direct implications for conservation of biological diversity and for the livelihoods of the local communities in the SNP and its BZ. The available fodder biomass in the rangelands within the SNP and its BZ has not been fully utilized yet as the total available supply exceeds the present demand under some assumptions: reduction of biomass through grazing causes higher productivity, resulting in a higher number of species (Bhattarai and Upadhyay, 2013).

Rangelands comprise grasslands, scrublands, forest and pastures. The estimated rangeland in the SNP and its BZ is 180 km² spreading over the alpine meadows and broadleaf conifer forests. These rangelands are important for wildlife forage, NTFPs/MAPs, tourism, carbon storage, and also have cultural significance for local communities. Much of the upper elevation landscapes between 3,500 m and 5,000 m altitudes are dominated by shrubs and grass cover. These landscapes are used primarily for livestock grazing, collecting fodder, wild foods, medicinal and aromatic plants. Despite rangelands' understood significance, there is inadequate information on their present management status. It has been reported that the rangelands in and around the SNP have come under increased pressure of human interventions and irregular grazing in the recent years.

The settlement of grazing rights in the Himalayan Parks often leads to conflicts and controversies but it is not possible to achieve a complete ban on livestock grazing in the Himalayan protected areas (ICIMOD, 2000). The major issues are:

- Inadequate research related to high elevation rangelands;
- Inadequate information regarding extent, status and management of rangelands; and
- Unmanaged livestock grazing, leading to wildlife-livestock competition.

5.3.2.1.2. Activities

- Survey and mapping of the rangelands in and around the Park in relation to use by wild animals and livestock;
- Conduct long-term research on rangeland dynamics; and
- Demarcate the grazing and non-grazing areas to regulate the livestock grazing in the SNP.



5.3.2.2. Wetland Management

5.3.2.2.1. Context and Issues

Conservation of high mountain wetlands has become an increasingly significant global issue in the recent years, especially given that these wetlands function as water towers for the world. They are important resting sites and habitats for a significant number of migratory and some resident

water birds. The high-altitude flora and fauna are important for global biological diversity as there are very few other places where life exists at such unique high altitudes. In Nepal, very limited studies and research have been conducted focusing on high mountain wetlands. There is paucity of information, therefore, making it difficult to get a clear idea on their status especially with regards to the threats and their management.



The snow-fed Dudh Koshi and Imja Khola originating from the Himalayas and the TAR of China are the main aquatic habitats in the Khumbu region. In addition, there are many glacial lakes that harbor wetland habitats for migratory birds. However, there is no evidence of aquatic life in its river systems and lakes due to icy-cold temperature (SNP, 2003). The Gokyo and the associated wetlands of the Park enlisted in Ramsar site designated in 2007 cover an area of 7,700 ha. Its altitude ranges from 4,600 m to 5,500 m. Out of the cluster of 6 lakes, Gokyo is the most important wetland, and is believed to be the abode of snake-god, and is, therefore, culturally important. It is a glacier-fed natural freshwater lake. The lake along with the Ngozumpa Glacier is the headwater of the Bhote Koshi River. The local people are dependent on the site for ecotourism which is the main economic activity of the people living there. Water pollution, over-grazing of pastures, unsustainable harvest of natural resources and likely impact of climate change are

the major conservation issues that threaten the Gokyo and the associated lakes (DNPWC, 2008). High-altitude wetlands are naturally vulnerable as these lie in an ecologically fragile and unstable zone; the movement of Nojumba Glacier is always a threat to the existence of the lakes. Glacial Lake Outburst Floods (GLOFs), pollution, overgrazing, unsustainable harvesting of resources are the pronounced threats to wetlands. The major issues for the management of wetlands in the SNP are:

- Inadequate information: research and information;
- Lack of integrated wetland management: multiple ownership and management;
- Poor coordination: no formal established coordination mechanism;
- Poor institutional mechanism: both formal and informal;
- Impact of climate change in the high-altitude wetlands;

- Pollution in the high-altitude wetlands;
- Overgrazing and unsustainable harvesting of the resources including the NTFPs in the catchment areas; and
- Garbage and sewage left by the visitors because of unregulated tourism.

5.3.2.2.2. Activities

- Prepare inventory of wetlands and conduct assessment for water quality;
- Conduct regular monitoring of the Gokyo and the associated lakes in order to keep the lake and surroundings free from pollution (see also Table 3);
- Fill up the Ramsar Information Sheet (RIS) of

the Gokyo and the associated lakes every year, and report to the Ramsar Secretariat at every six years;

- Update the Site Management Plan of the Gokyo and the associated lakes, and implement it with active participation of the local communities;
- Strengthen awareness programs for conservation of the wetlands;
- Conduct trainings on the alternative income-generation activities so as to reduce the dependency of the local people on wetlands;
- Educate the local people, especially the children on the importance of wetlands for the human-being, and conduct interactions and meetings amongst the stakeholders on conservation of wetlands regularly.

Table 3: Priority areas of action for the management and proper use of the Gokyo and the associated lakes

At strategic-level
<ol style="list-style-type: none"> 1. Adopt zoning system of the lake area at the sub-catchment scale; 2. Promote sustainable wetland eco-tourism; 3. Raise community awareness regarding value of the Himalayan wetlands; 4. Promote the use of non-wood energy; and 5. Facilitate action research and monitoring.
At site-level
<ol style="list-style-type: none"> 6. Take actions to control pollution of the Gokyo Lake; 7. Manage the overgrazing on the pastures; 8. Put legal and social sanctions on the unsustainable harvest of the natural resources; 9. Take legal and social actions against encroachment; and 10. Study the impact of climate change in the area.

Source: DNPWC, 2008

5.3.2.3. Fire Management

5.3.2.3.1. Context and Issues

Forest fire is another threat to the Park biodiversity as the Park and its surroundings are popular for pine forests. Pines are fire prone species, so forest fire occasionally occurs and creates severe impacts in the forests. The local BZUCs are closely working with the Park Authority to control the forest fire. The trend shows that fire incidents have increased in the SNP mostly in the hot summer seasons. The main objective of fire management in the SNP is to prevent accidental fire so as to avoid the adverse effects of fire on the wildlife species and their habitats.

5.3.2.3.2. Activities

Since there is no strategy for fire management in the SNP at present, the following strategies are prescribed in this plan:

- Identify fire-prone areas using the topographical map based on satellite imagery analysis or using the web-based fire-mapping software, and manage accordingly for fire prevention;
- Conduct trainings on fire-fighting techniques both to the Park Staff and the local people; and
- Raise awareness on fire prevention and forest fire control.

Chapter VI

Research, Monitoring and Capacity Building

6.1. Research

Research is essential for every PA as it helps to develop database and supports in decision making process. In order to ensure effective management, there should be sufficient information on bio-physical, ecological and socio-cultural aspects of PAs. In addition, it allows scientific management of PA and also serves as a tool to solve problems. Thus, research and monitoring should be oriented towards fulfilling the management needs. In this regard, SNP has received much stronger attentions from both national and international researchers compared to the other mountain PAs. However, most of the research results are in scattered form,

and the results of many research works are not even known to the Park Manager. There is a very limited infrastructure for research in SNP as there are no permanent research stations in the Park except the Ev-K2-CNR/NAST Pyramid Research Laboratory. In order to ensure that the research results are applied to the conservation and management of SNP and its BZ, there is a need to coordinate the works of the different national and international researchers. The formation of a separate research unit to lead and coordinate research activities is essential to synthesize the research results and make them applicable in park management. In addition, scientific management of data is crucial for yearly planning of activities and their implementation.



6.1.1. Research Priorities

SNP does not have research priorities set at present. The research areas in SNP and its BZ have mostly been determined by the interest of the individual researchers or the institutions conducting research. The park does not have its own ongoing research and monitoring programs, and so has been dependent on outside researchers for information. If this situation continues, the Park will not be able to get the information it needs for the management of itself and its BZ. Thus, there is a need to set research priorities for the SNP and its BZ. The list

of priority areas for research in SNP and its BZ at present could be as follows:

- Rangeland management practices and its impact on conservation with special focus on requirement of snow leopard and its prey species;
- Population dynamics, habitat use and resource partitioning of the sympatric wildlife species;
- Genetic study of the key wildlife species such as snow leopard, musk deer and red panda;
- Movement and ranging behavior of snow

- leopard with special focus on its dietary requirement and impact of tourism activities;
- Impact of buffer zone program on conservation and sustainable livelihoods of the local communities;
- Climate change indicators and impact on biodiversity conservation along with adaptation strategies;
- Effectiveness of planting suitable forest tree/shrub/herb species in the SNP and its BZ;
- Trend of tourism and its future if the Salleri-Surke road is developed;
- Feasibility study of translocating blue sheep to supplement the prey species for snow leopard;
- Climate change impacts on biodiversity of the SNP such as tree line shifting: baseline study;
- Status of biodiversity conservation in the Gokyo and the associated wetlands- Ramsar site;
- Status of NTFPs in SNP and its role in supporting the livelihood of the off-route families in the SNP and its BZ;
- Status of energy use in SNP and its BZ, i.e. how many households are using alternative sources such as electricity and solar energy, and how many households still depend on traditional sources of energy for lighting and cooking purposes;
- Effectiveness of Nawa and Community Conservation Area in the SNP;
- Status of medicinal herbs of Tibetan Amchi at Thame, Chaurikharka and Tyangboche;
- Assessment of GLOF hazard in relation to ecological succession; and
- Impact of peak climbing on natural environment.



6.1.2. Research Unit

There will be a research unit headed by an Assistant Conservation Officer in the Park. The unit should be responsible for coordinating the ongoing research activities, planning, prioritizing and carrying out research activities. The unit should be provided with necessary field-gears and equipment, appropriate lab, financial resources and trained staff. Scientists and research institutions conducting research studies for academic purpose will also have some management implications. In addition

to the ongoing monitoring and research activities of the Park, SNP management can collaborate with the concerned scientific and research institutions like ICIMOD, NTNC and IOF for research on the basis of its priority areas. In addition, interested organizations and individuals may undertake their research works in SNP and its BZ by taking permission from the designated authority in close coordination and collaboration with SNP.

6.2. Monitoring

Monitoring wildlife and its habitat on regular basis is very important for the management of any protected area. The result from periodic monitoring gives the idea on the trend of wildlife population and change in habitat condition 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 as it helps

- To assess the effectiveness of PA management;
- To enhance the understanding on ecological processes and functions;
- To track the change in habitat over time and compare the condition between similar habitats based on ecological baseline; and
- To find areas, where further research is needed and prioritizes the research needs.

Keeping these facts in mind, the following key areas and framework for monitoring related to wildlife and its habitat in SNP and its BZ have been proposed:

6.2.1. Population Monitoring

Snow leopard monitoring

- Annual monitoring using SLIMS technique during winter in potential habitats within SNP; and
- Monitoring of Himalayan tahr as a key prey species of snow leopard in SNP.

Musk deer monitoring

- Regular monitoring of musk deer based on direct sightings and indirect signs in SNP; and
- Total counting of musk deer after every five years.

Red Panda monitoring

- Red panda monitoring in SNP and its BZ; and
- Total count of red panda after every five years.

Himalayan black bear monitoring

- Himalayan black bear monitoring in the SNP and its BZ.

Bird survey

- Survey of migratory and other water birds.
- Monitoring of globally significant and nationally protected birds.

6.2.2. Habitat Monitoring

For vegetation monitoring in SNP, there is a need to establish permanent monitoring plots. The vegetation of different categories will be measured and recorded in the plots of different size before and after winter season. The change in rangeland vegetation will be recorded in the plots. Various attributes of rangelands, including the species present, height, stage, alien species, woody vegetation, grazing intensity, unpalatable species and sign of wildlife species will be recorded.

6.2.3. Weather Monitoring

There is a meteorological station managed by DHM at Namche in SNP. There is a need of another two meteorological stations in the Park, one in the Everest base-camp area and another in the Jorsalle area. After the establishment of the meteorological stations, the data will be recorded, documented and analyzed to track the change in weather pattern.

6.2.4. Fire Monitoring

Spatial and temporal pattern of fire incidence, fire and fuel dynamics will be monitored, and mapped out by using field-based techniques such as GPS and web-based fire-mapping software programmes as required.

6.2.5. Tourism Impact Monitoring

Visitors in sensitive areas may create multiple impacts on natural environment. Thus, ecological impact of tourism in SNP should be monitored



regularly. Since there is no comprehensive framework to monitor such impacts, site-specific framework will be developed and the changes will be monitored. For socio-economic impact of tourism, suitable format will be developed by incorporating all the aspects of tourism linkages in

livelihood of the local communities, and survey will be conducted annually to document the changes/improvements in the local communities' day-to-day life from tourism. The revenue rate will be reviewed and will be amended after every five years. Based on the season and possible intensive pressure of tourists flow, SNP will develop different schemes.

6.3. Capacity Building

Protected area management involves complex issues to be addressed for the sustainability of the biodiversity conservation endeavors. Thus, park staff should have a range of skills on technical as well as managerial aspects of the PA management. However, there are very limited experienced staff in the SNP especially in field techniques, many things are to be learned and shared through various trainings. Need-based trainings will definitely increase the efficiency of staff working in the Park. The need for training differs according to the position and roles given to the staff. Thus, training need 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 tiers and share experiences and build mutual trust and relations. Some of the capacity building trainings/workshops that are considered important for SNP Staff are as follows.

6.3.1. For Vertical Participants

- Annual sharing meeting and team building workshop;
- Appreciative Project Planning and Action (APPA) workshop;
- Training for community based anti-poaching operation; and
- Orientation training on legal issues.

6.3.2. For Frontline Staff

- Wildlife management/handling techniques;
- Basic training on field equipment like Compass and GPS;
- Training on Real-time SMART patrolling and anti-poaching operation;
- Field techniques, including signs and indirect evidences of wildlife;
- Orientation training on social mobilization and participatory planning;
- Basic training on vegetation quantification for recording data during plot-monitoring;
- Wildlife health condition assessment; and
- Fire fighting techniques.

6.3.3. For Rangers

- Software applicable for wildlife management, including GIS, Distance and SPSS;
- Certificate course in wildlife management;
- Training of Trainers (general and specialized);
- Real-time monitoring of glaciers;
- Training on nature interpretation and display management;
- Training on monitoring of the impact of recreational activities;
- Training on Real-time SMART patrolling and anti-poaching operation;
- Training on community development, conservation awareness and human rights; and crime scene training.

6.3.4. For Wardens and Chief Wardens

- Training on personnel management and legal procedure;
- Training on GIS and remote sensing;
- Diploma course in wildlife management;
- Training on conflict management;
- Training on appreciative enquiry;
- Training on monitoring and evaluation.

Likewise, basic conservation orientation training is needed for Nepal Army protection unit while there is a need of special training on conservation and buffer zone management for buffer zone committees.



Chapter VII

Species Conservation Special Programme

7.1. Snow Leopard Conservation

7.1.1. Status, Significance and Conservation Efforts

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). Snow leopard is listed in the Appendix I of the CITES and endangered category on the IUCN Red List of Threatened Species (IUCN, 2015). The Government of Nepal has included the Snow leopard in the list of protected mammals and has implemented several

activities for its conservation in collaboration with various conservation partners (DNPWC, 2013). Major threats to the Snow leopard include reduction of natural prey due to competition with livestock, killing of snow leopards in retaliation for livestock depredation, habitat degradation and fragmentation, lack of trans-boundary cooperation and illegal trade (Jackson *et al.*, 2008; DNPWC, 2013). The Government of Nepal is committed to establish three snow leopard viable landscapes by 2020. SNP belongs to eastern landscape and forms a part of Sacred Himalayan Landscape.



Snow leopards disappeared from the Everest region in 1960s. The presence of transient snow leopards, visiting from adjacent Tibet, in the Gokyo region of SNP was reported in the late 1980s. The return of snow leopards in SNP was attributed to the higher abundance of Himalayan tahr (*Hemitragus jemlahicus*), musk deer (*Moschus chrysogaster*) and game birds after almost three decades of effective protection (Ale, 2007). Snow leopards have increased in abundance and they are now residents of the SNP. The density of snow leopards in the SNP is estimated to be between 1 to 3 individuals per 100 km², based on different sets of pugmarks and actual sightings of snow leopards (Ale, 2005).

Small population of Himalayan tahr in the SNP is sensitive to stochastic predation events and may lead to almost local extinction. If predation on livestock keeps growing, together with the decrease of Himalayan tahr, retaliatory killing of snow leopards by the local people may be expected, and the snow leopard could again be at risk of local extinction. Restoration of biodiversity through the return of a large predator has to be monitored carefully, especially in areas affected by humans, where the lack of important environmental components, for example key prey species, may make the return of a predator a challenging event (Lovari *et al.*, 2009). The upper portion of the Gokyo Valley provides a poor habitat for snow leopards, whereas the much

rugged lower Gokyo offers quality habitat. Most of Thame does not support snow leopards. However, the lower Thame offers one of the best cliffy (thinly forested) slopes for cats to hunt tahr. Phortse exhibited the most abundant snow leopards signs in 2004 among the three valleys sampled (Gokyo, Namche and Phortse). The 2005 survey, however, indicated Namche with the greatest signs. This disparity may be observer-biased, or other factors such as livestock movement may have been involved. In 2004, there was an excessive movement of yaks (around 1,000) brought by the Tibetan traders in Namche. In 2005, no trading (by Tibetan traders) was allowed in Namche, which minimized the subsequent impact of yaks (Ale, 2007).

In Nepal, snow leopards are found in three snow leopard landscapes. The eastern landscape coincides with Sacred Himalayan Landscape (SHL) and includes Langtang, Gaurishankar, Sagarmatha, Makalu-Barun and Kangchenjunga Himals. Out of the 13,000 km² of snow leopard potential habitat

in Nepal, 220 km² lies in SNP, which spreads from eastern part of Tashi Lapcha to the northwest towards the Ama Lapcha/ Mera Peak. The estimated snow leopard population in Nepal is 301 to 400 individuals whereas there are only 4 snow leopards estimated in the SNP (DNPWC, 2013).

Impacts of climate change have emerged as unavoidable threats to snow leopards and their habitats. Models based on global climate change trajectories suggest that Nepal will lose about 40% of alpine habitat due to upslope habitat shifts. The projected consequences will be the loss, degradation and fragmentation of snow leopard habitats, isolating populations within smaller habitat patches, and compromising their demographics, which include their ecological and even genetic viability. Habitat shifts may cause overlapping of snow leopard habitat with other cats resulting in increased competition. Many of the traditional pastoralist systems are currently in the process of substantial change due to external influences related to modern development that could significantly influence the alpine predator-prey system (DNPWC, 2013).



Snow leopards' principal natural prey species is bharal or blue sheep (*Pseudois nayaur*) whose distribution coincides closely with the snow leopard range. An adult snow leopard requires 20 to 30 adult blue sheep annually and a solitary leopard

may remain on a kill for up to a week (Jackson *et al.*, 2008). Blue sheep (*Pseudois nayaur*) are the key prey of the endangered snow leopard in the Himalayan region of Nepal (Aryal *et al.*, 2013; DNPWC, 2013). Himalayan Tahr is the main prey species of snow

leopard in SNP as blue sheep is not present in the area. The estimated population of Himalayan tahr in the SNP based on the field monitoring conducted in

Namche, Furte, Thame, Jorsalle, Tasinga, Phorche, Dole, Debucho and Pangboche during April–May, 2012 is 222 individuals (SNP, 2012, see also Figure 4).

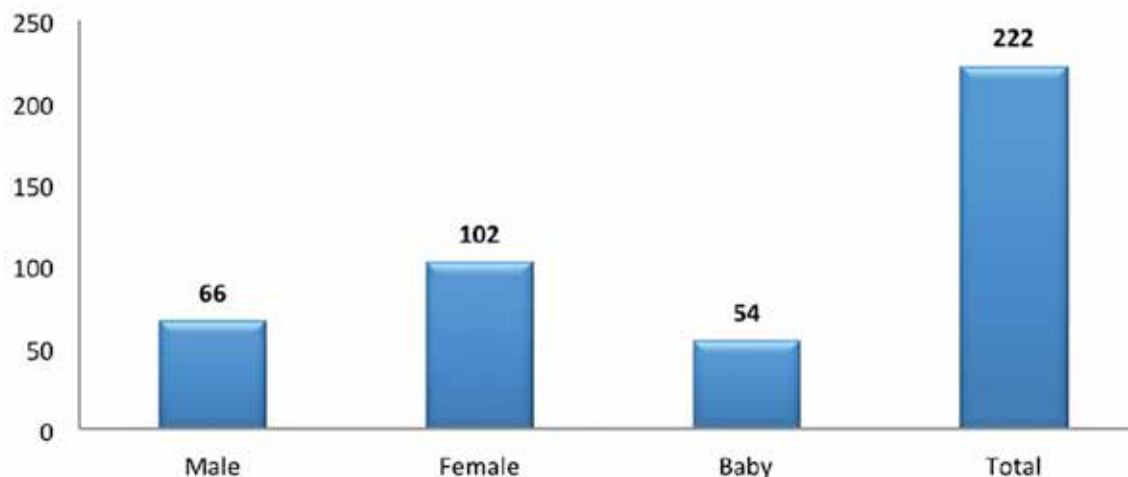


Figure 4: Population of Himalayan Tahr in Sagarmatha National Park (SNP, 2012)

However, the snow leopard population has recently recolonized into SNP where the blue sheep are currently absent, and the evidence of snow leopard depredation of livestock can be found (Aryal *et al.*, 2013). A solution to this likely human–wildlife conflict is the translocation of blue sheep back into this area. SNP is significantly similar to the Kanchanjunga Conservation Area (KCA) in terms of vegetation, elevation, precipitation, soil, aspect and slope. Therefore, translocation of blue sheep from KCA to SNP is expected to support the population of snow leopards and other predators in the Park. However, a detailed assessment is needed regarding human disturbance, grass biomass and potential impact of climate change at specific release sites and decisions on the number of blue sheep to be relocated (Aryal *et al.*, 2013).

7.1.2. Issues

The major issues of concern are:

- Inadequate information on status, distribution and ecology of snow leopard in SNP and its BZ;
- Inadequate capacity of the Park Staff and the local communities in snow leopard conservation including snow leopard and its prey monitoring;
- Likely impact of climate change on snow leopards and their habitat;
- Unmanaged grazing by the domesticated cattle in the Park poses serious threat to snow leopard habitat;

- Inadequate prey-base for snow leopard in the Park;
- Poaching of snow leopard and illegal trade of its body parts leading to a serious threat for the survival of snow leopards in the future;
- Human-snow leopard conflict;
- Impact of tourism on snow leopard and its habitat; and
- Inadequate public awareness on snow leopard conservation.

7.1.3. Activities

- Regularly conduct snow leopard monitoring using standardized Snow Leopard Information Management System (SLIMS) technique to update the status and distribution of snow leopards and their prey;
- Capacitate and mobilize the Park Staff and the local communities to monitor snow leopards and their prey;
- Initiate long-term study on the ecology and behavior of snow leopards and their prey in SNP through the use of cutting-edge technologies;
- Initiate mapping of climate variability and vulnerability of snow leopard habitats for their proper management by addressing the potential impacts of climate change;
- Identify priority habitat, critical corridors and climate-refugia for snow leopards in the face of climate change;

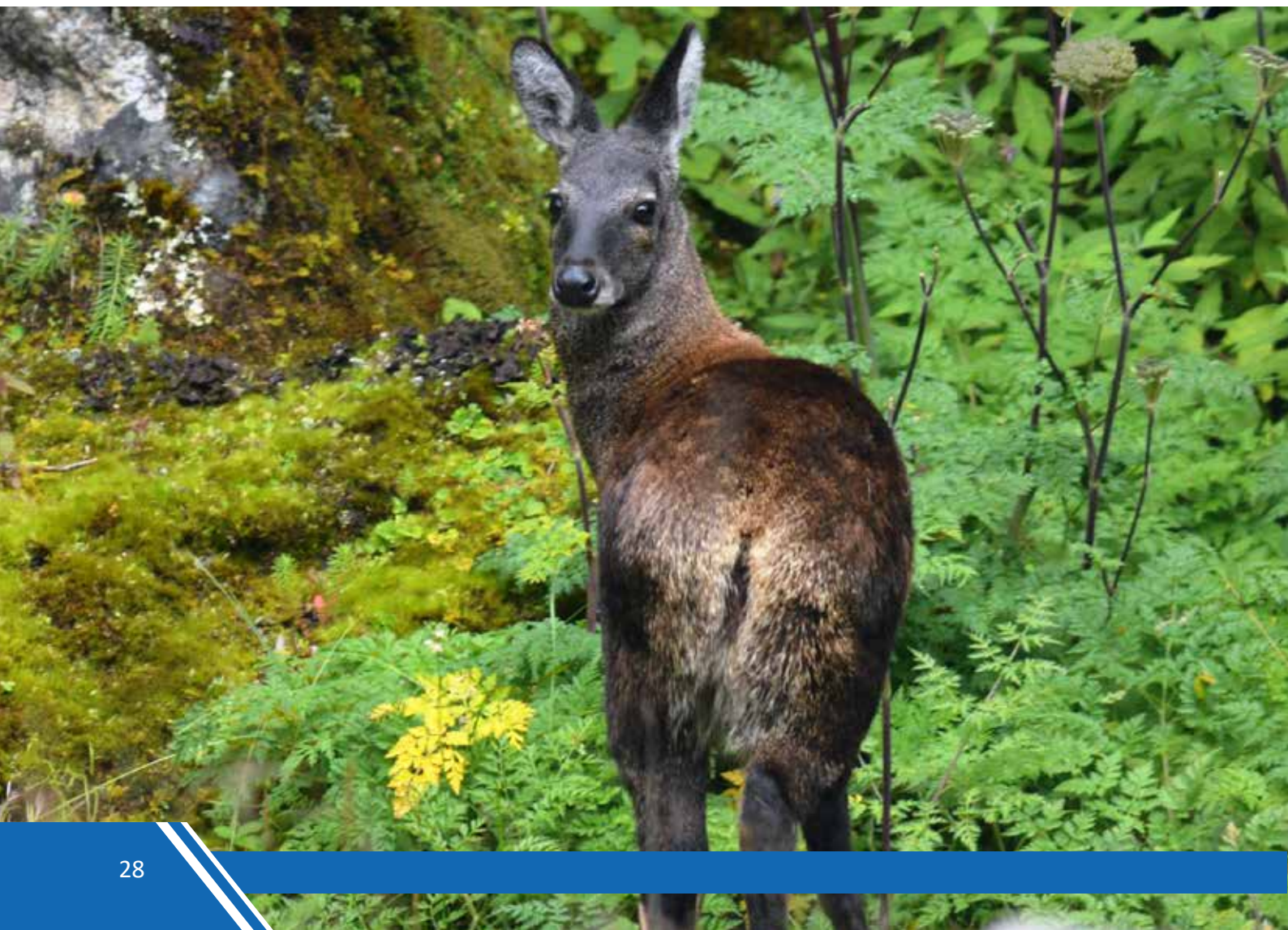
- Promote indigenous herding practices and sustainable grazing system to avoid competition between snow leopards' prey and livestock;
- Conduct feasibility study to translocate blue sheep in suitable habitats within SNP to supplement prey for snow leopards;
- Train and mobilize the Park Staff and the local youths in order to monitor and control likely killings of snow leopards and illegal trade of its body parts;
- Establish security posts in strategic locations throughout SNP and its BZ;
- Intensify patrolling effort and initiate SMART patrolling to ensure the zero poaching of snow leopards;
- Strengthen trans-boundary coordination to control illegal trade of snow leopard parts and to foster cooperation for snow leopard conservation at trans-boundary landscape;
- Develop and institutionalize community-based insurance scheme for snow leopard victims;
- Develop snow-leopard-based eco-tourism to increase the value of snow leopards in the local communities;
- Develop both formal and informal extension materials regarding snow leopard conservation;
- Conduct meetings and interaction programs for youths and school students within the BZ of the Park.

7.2. Himalayan Musk Deer Conservation

7.2.1. Status, Significance and Conservation Efforts

The Himalayan Musk Deer (*Moschus chrysogaster*) is distributed from the eastern to the western Himalayas of Nepal. The species is listed as endangered in Appendix I of the IUCN Red Data, and protected in Nepal under the National Parks and Wildlife Conservation Act, 1973.

Musk deer inhabits in the middle to the higher mountain regions which cover 12 PAs of Nepal. However, of the 30177.19 km² 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).



Musk deer are distributed at elevations between 3000–4200 m in SNP. However, they can be sometimes observed in lower parts at an altitude of 2800 m (Jorsalle). They are distributed from Tasinga, Chhuwa, Lausasa, Seluwa, Kyanjuma, Phungithaga, Thulo Odar up to Shyangboche (3,720 m); from Debuche, Omaka, Milunga, Yaranga up to Pangboche (3,930 m) on the way to the Island Peak; from Mongla (3,973 m), Phortse Thanga, Phortse Pakha, Phortse up to Dole (4,200 m) on the way to Gokyo and from Furte, Pare up to Thamo (3,493 m) on the way to Gomo or Mokyo. Twenty-five musk deer have been noticed in Phortse (Rajchal, 2006). The recent study reported only 39 musk deer (11 male, 16 female, and 12 unidentified) in Debuche, Tengboche, Phortse, Thanga, Dole and the associated areas during the field survey. Musk deer was distributed over approximately 131 km² of the Park area, in the forests of the Khumjung, Namche and Chaurikharka VDCs. In Khumjung VDC, musk deer have a wider range of suitable habitat than in others. Musk deer were reported to be found in the forests of Kyanjuma, Tasinga, Phungithanga, Thulo Odhar, Nagdin, Tengboche, Phortse, Thanga, Phortse Pakha, and Dhole (4,200 m). In Namche VDC, they were found at Top Danda, Furte, Thamo, Pare and Thame. They were also sighted at Jorsalle

and Kongde Danda in the Chaurikharka VDC outside the Park Boundary (Aryal and Subedi, 2011).

The main threat for musk deer is poaching. The poachers mostly come from outside the district and set up the traps. They only take the pod of the musk deer after killing the animal, and leave the remains of the body at the same place. In Phortse area, the Sherpa culture and religion consider wildlife as a god. They do not kill musk deer, so the musk deer population is frequently sighted in that area. The Pare, Tengboche, Nagding and Dhole areas of SNP were once the most vulnerable sites for musk deer poaching. Livestock frequently uses the musk deer habitat; it was estimated that 35% of the musk deer habitat is overlapped by livestock grazing, which is among the other threats to the survival of musk deer in their natural habitat. Snow leopard disappeared from the Everest region in 1960's, but now it has again appeared in the SNP, which led to an increase in the risk of musk deer being killed by snow leopards. It is reported that 31% of snow leopard's diet consists of musk deer. That was also a risk considered to have reduced the viable population of musk deer due to such new predators in the region. However, the collection of excess timber and firewood also degraded the habitat of musk deer (Aryal and Subedi, 2011).

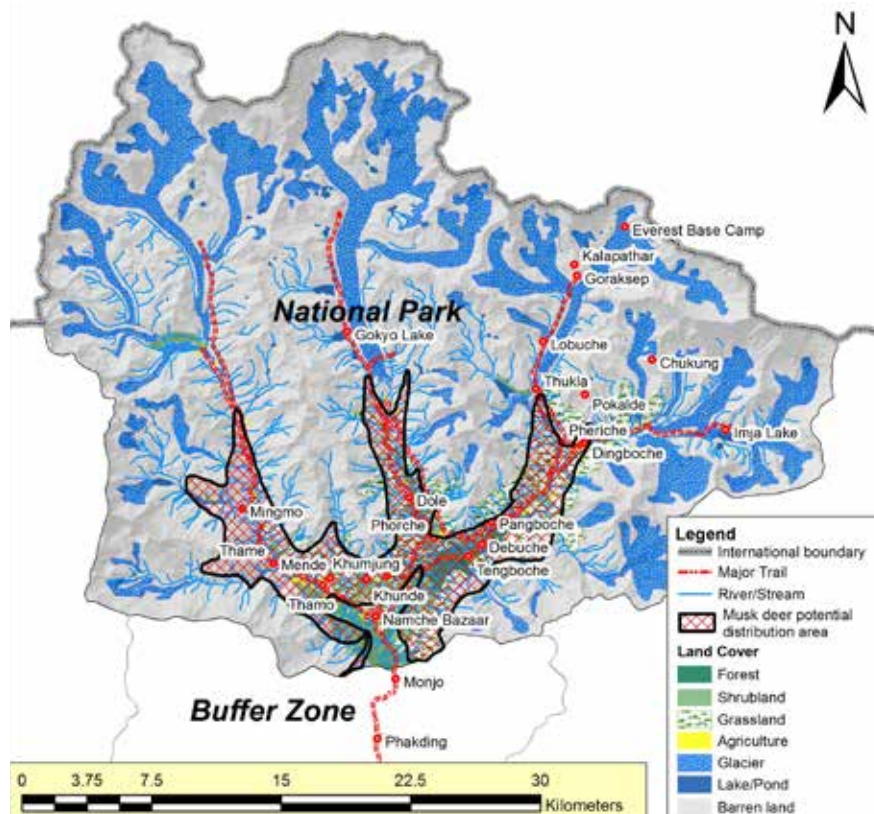


Figure 5: Potential Musk Deer Distribution Areas in Sagarmatha National Park (Aryal and Subedi, 2011)

Musk deer is commonly found in SNP between 2,500–4,000 m where the area is covered by Birch (*Betula utilis*), Fir (*Abies spp.*) and Rhododendron (*Rhododendron spp.*). It is also recorded from *Pinus wallichiana* and *Arundenaria* forests, and sometimes it comes out to open grasslands

and potato fields. Musk deer is mostly found in Tengboche, Tasinga, Phortse, Pangboche, Dole, Kyanjuma and Syangboche areas (SNP, 2004, Rajchal, 2006). Approximately 49 km² area of the SNP is considered as suitable habitat for musk deer (SNP, 2004, see also Figure 5).

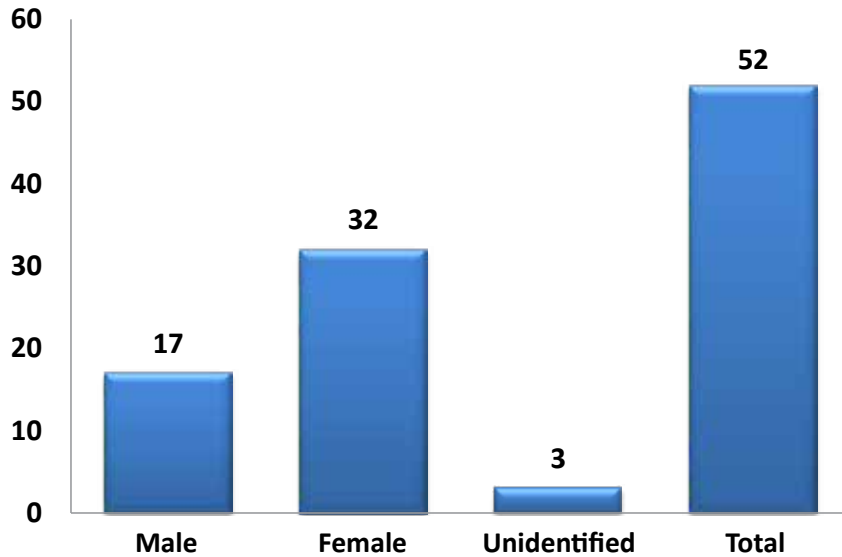


Figure 6: Population of Himalayan Musk Deer in Sagarmatha National Park (SNP, 2004)

7.1.2. Issues

The major threats to the long term survival of the Himalayan musk deer in SNP and its BZ are:

- Habitat degradation;
- Poaching of musk deer for illegal trade of its musk-pod;
- Competition with livestock as they share the park for grazing; and
- Killing of musk deer by feral dogs.

7.1.3. Activities

- Identify key habitats for musk deer, and ensure their protection;
- Keep key habitats of musk deer inviolate from all sorts of anthropogenic pressures;
- Manage key areas for regular supply of forage for musk deer; and
- Control feral dogs.



7.3. Red Panda Conservation

7.3.1. Status, Significance and Conservation Efforts

Nepal is home to approximately 1.9% of the total global population of red panda, which is estimated on the basis of habitat suitability index model. Red panda is patchily distributed within the altitudinal range of 2,500–4,000 m from east to west in temperate and sub-alpine zones of Nepal. Based on the study reports, sightings and signs, the presence of red panda has been confirmed in eight mountain

Protected Areas of Nepal, covering approximately 38% of the total potential red panda habitats in the nation; Langtang National Park alone shares 24.33% of the total red panda population. The ecology of red panda is poorly known due to its elusive behavior and restricted distribution in inaccessible areas (LNP, 2010).



The estimated population of red panda in SNP and its BZ based on the field monitoring conducted in 5 BZCFs (Himalayan, Kongde, Dudhkunda,

Pemachholing and Red Panda) of the Chaurikharka VDC in March, 2012 was 105 individuals (SNP, 2012, see also Figure 7).

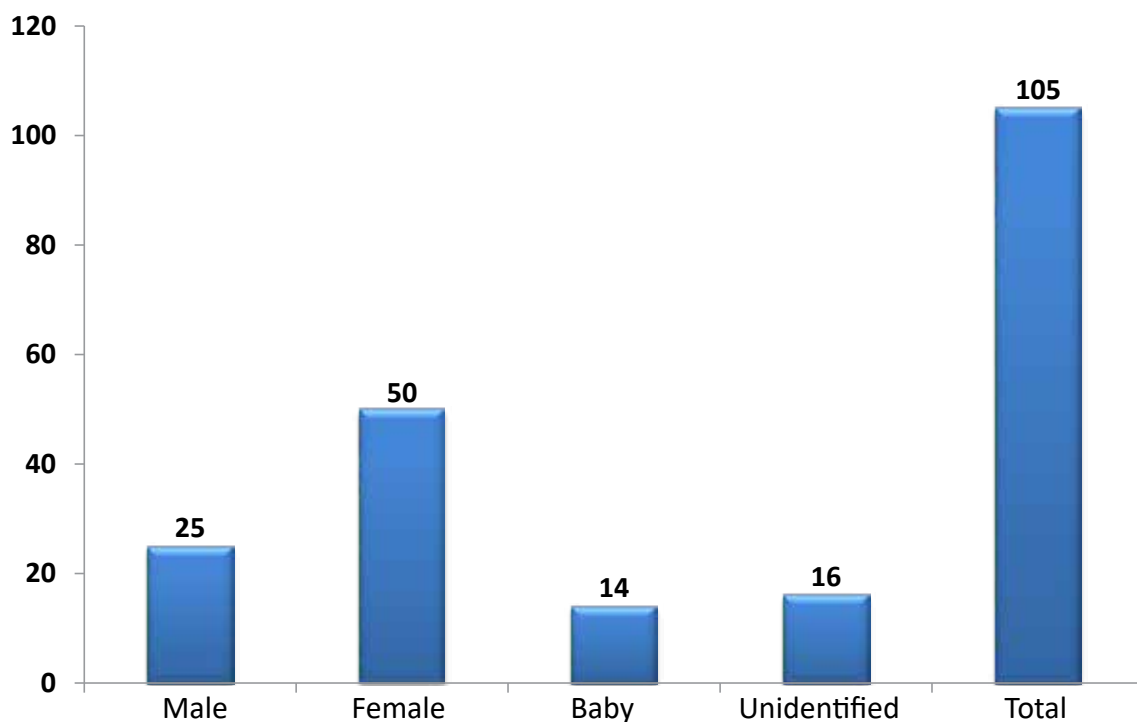


Figure 7: Population of Red Panda in Sagarmatha National Park (SNP, 2012)

Long-term initiatives are needed for the conservation of red panda in Nepal. The Government of Nepal has listed it as a protected animal. The population of red panda faces threats predominantly from livestock grazing and other human-induced activities such as collection of fuel-wood, timber, mushrooms and other non-timber forest products (NTFPs) by the local herders, hotel operators and pilgrims. These human-induced activities lead to degradation of red panda habitats.

7.3.2. Issues

- Status of red panda in SNP and its BZ: not updated;

- Ecology and behavior of red panda in the SNP and its BZ: not documented well;
- Increasing anthropogenic pressure to red panda and its habitats from the local people.

7.3.3. Activities

- Update scientific information on red panda habitats and their conservation;
- Manage the natural habitats of red panda; and
- Enhance and promote awareness of red panda conservation.

Chapter VIII

Tourism and Nature Interpretation

8.1. Background

Tourism in protected areas should not be limited to providing recreational opportunities for visitors and generating park revenue. It should be an effective means to raise awareness among visitors through nature education and maximize the benefit to the local communities in eliciting public support for conservation. Thus, the objective of tourism in park should aim at enriching visitors' experience as well as informing them on conservation needs and their anticipated role in protecting natural and cultural heritages for the future generation

too. Interpretation is a process to communicate the message on natural and cultural heritage using objects, artifacts, landscapes and sites. Information is simply a fact whereas interpretation is an art of disseminating information. Thus, interpretation is not the message we communicate to visitors, but it is all about how we communicate it. Interpretation enhances visitors' understanding about the protected areas and need for their conservation, and they are supposed to appreciate the nature, and in turn they support to conserve it.



Tourism in the protected areas should be developed and managed at a level that benefits conservation. It is evident that tourism generates revenue for conservation while conservation promotes tourism. Sustainability of conservation will be enhanced if tourism could support the livelihoods of the local people. The issue here is how to create a win-win situation; eco-tourism promotion in real sense could serve the purpose. Tourism with eco-friendly travelling to experience the nature while promoting conservation and economically contributing to local communities is regarded as eco-tourism. Thus, tourism in the protected areas

should be ecologically sustainable, economically viable and socially acceptable that will ultimately enhance wilderness experience and contributes to conservation and livelihoods of the local communities.

8.2. Tourism Scenario

Tourism in the Khumbu region was started during 1950s with the opening of the area for foreigners in 1950. The Park-record shows the increasing trend of tourists visiting the Park i.e. 3,600 tourists in 1975–76 (Garratt, 1981) to 35,171 tourists in

2013–14 (SNP, 2014, see also Figure 8). The tourist entry fee constitutes major source of revenue collected by the park each year. The tourist record

of the SNP from FY 1975–1976 to FY 2014–2015 is presented in Annex VI.

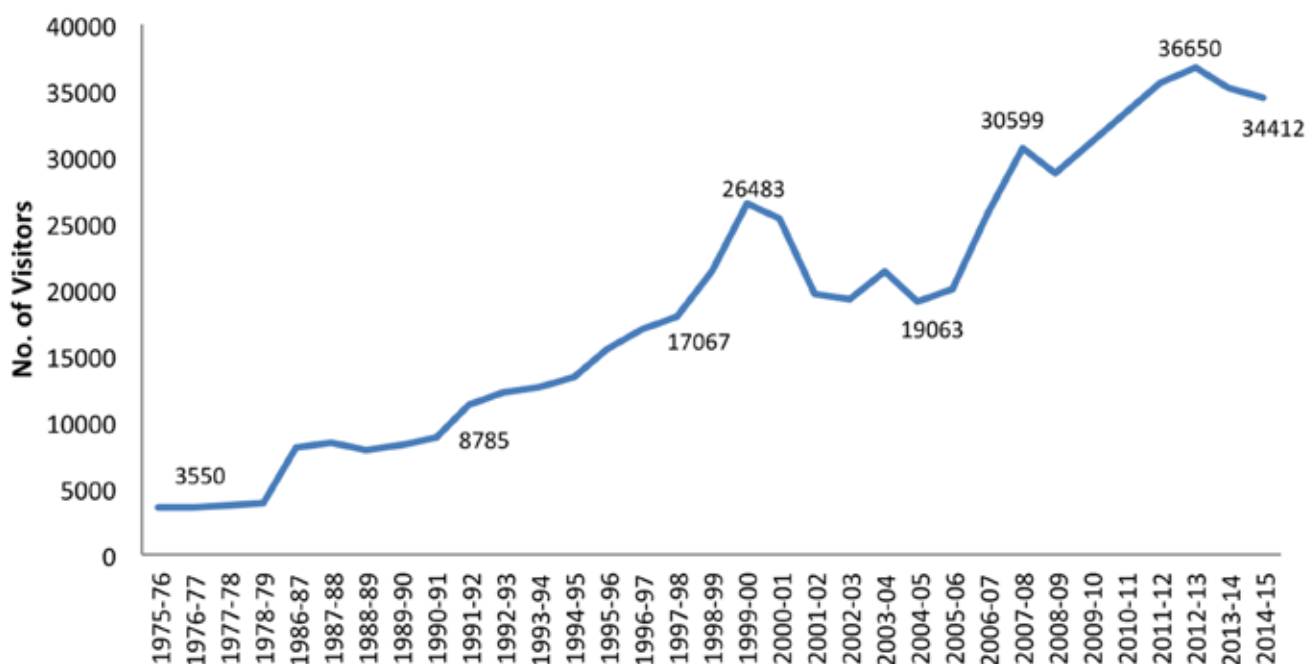


Figure 8: Tourism Trend in Sagarmatha National Park (SNP, 2014)

Sagarmatha National Park is one of the prime tourist destinations of Nepal attracting over 35,000 visitors in a year. The annual tourist influx in FY 2013–014 (July, 2013–June, 2014) was 35,171 out of which 1,050 (3%) were SAARC nationals and 34,121 (97%) were foreigners. Out of the total visitors of the

Park in FY 2013–014, 20,373 (58%) were male and 14,798 (42%) were female. The Park-record shows that tourists from 82 different countries of the world visited SNP whereas more than 60% of the visitors were from 10 Countries (SNP, 2014, see also Figure 9).

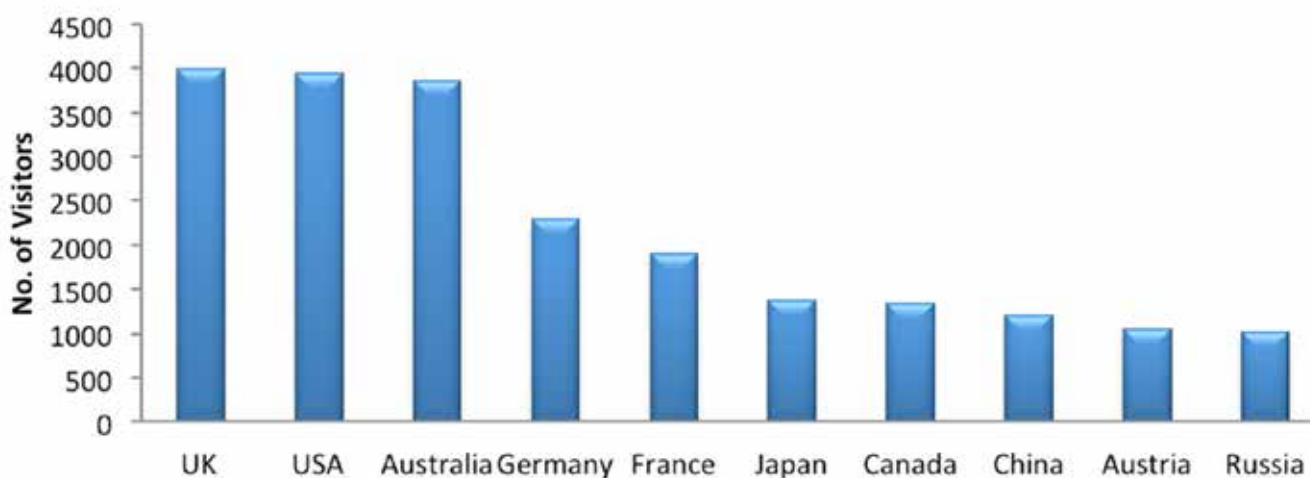


Figure 9: Number of visitors in Sagarmatha National Park by Month (SNP, 2014)

There are two peak seasons for visitors in SNP; one is September to November (Ashoj–Kartik) and another between the months of March and May

(Chaitra–Baisakh). Generally, 75% visitors come to visit SNP during these six months of the year (see Table 10).

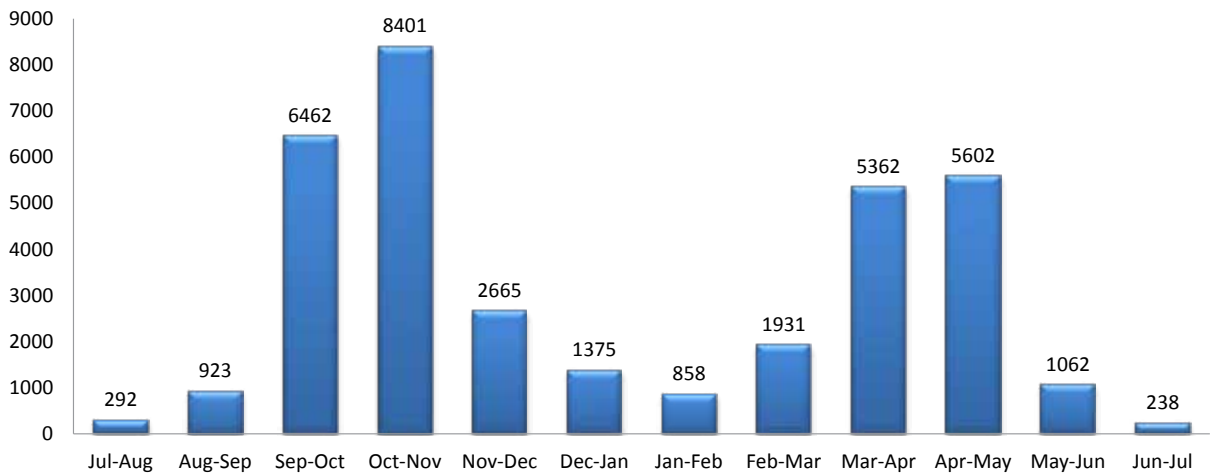


Figure 10: Number of Visitors in Sagarmatha National Park by Month (SNP, 2014)

8.3. Interpretation Facilities

There are limited interpretation facilities available in and around the Park. There is a visitor center at Namche, which provides brief information on various aspects of the National Park and its BZ.

8.4. Issues

- Overcrowding, especially during peak season affecting upon wilderness experience and visitors’ satisfaction;
- Unplanned tourism infrastructure in the Park;
- Lack of clear tourism policy and dedicated institutional setup to deal with the increasing number of tourists in the Park;
- Limited interpretation facilities in the Park; and
- Limited conservation awareness programme for the local communities and visitors.

8.5. Objectives

- To provide wilderness experience to the visitors through regulated and diversified tourism activities in the Park with minimum possible disturbance to wildlife species and their habitats;
- To promote community-based eco-tourism to enhance the socio-economic status of the people living in the buffer zone so as to garner their support in conservation;
- To provide interpretation facilities on the ecological attributes and biological values and its significance to the visitors so as to enhance

conservation awareness for drawing their support in conservation; and

- To raise conservation awareness among the local communities and the school students to ensure the sustainability of the conservation programme.

8.6. Activities

In order to regulate and manage tourism to maximize the benefit for conservation as well as sharing the tourism benefit to the communities living in the BZ, the following possible activities are proposed:

- Develop a well-equipped interpretation Center at Namche;
- Initiate electronic ticketing system for the visitors from the Park entry-points;
- Rationalize tourism zones in terms of the routes used;
- Define and delineate trekking routes;
- Initiate assessment to study the impact of tourism on ecological aspects to determine the LAC which will help in devising site-specific method for regulating tourism;
- Explore the prospect of promoting low-volume high-value tourism designating the “Zero Carbon Tourism” in some specified areas of the Park;
- Develop a separate unit to manage the tourism activities in the Park;

- Build capacity of the staff to handle the tourism related issues in the Park; and
- Devise a set of Conservation Code of Conduct for the visitors, and implement it strictly.

8.6.1. Institutional Setup

- Establish a “Tourism and Conservation Education Unit” in the Park with dedicated staff to look after tourism and interpretation-related activities;
- Devise and implement regulatory framework for tourism service providers to ensure eco-friendly practices, including standards for construction of structures, energy and use of water, extent and capacity of the facilities to be created, employment to the local people together with their social and environmental responsibilities.

8.6.2. Impact minimization

- Study the impact of the existing tourism practices, both positive and negative such as enhanced protection through increased vigilance or disturbance from noise and dust on the wildlife species and their habitats, and determine the tourism zone accordingly;
- Adopt tailor-made approach for regulating tourism-based on the impact of existing practices of tourism on the sensitive environment;
- Promote low-volume high-value tourism designating the ‘Zero Carbon Tourism’ as a strategy for sustainable tourism promotion; and
- Devise the plan to minimize negative impact of tourism such as minimizing crowd, noise and dust.

8.6.3. Tourism Activity Diversification

- Promote tourism facilities available in the Park by marketing it in a package such as nature trail and bird watching;

- Develop some selected traditional off-route villages also as tourist destinations, and develop a package for home-stay tourism in such traditional villages;
- Develop tourism package including various recreational activities, and give unique and catchy names, and market those through web sites and publications.

8.6.4. Nature Interpretation

- Establish a well-equipped Interpretation Center at Namche;
- Enhance the capacity of the Nature Guides in nature interpretation, specifically on plants and bird identification through trainings and experience-sharing activities;
- Initiate conservation-focused programmes regarding the biodiversity conservation in general and the significance and current management of the SNP in particular at the schools in the buffer zone through ToT;
- Strengthen “Eco-club” programme at the schools in the BZ designing Khumbu specific nature conservation course for informal education, and also involve them in conservation awareness activities like conservation quiz, speech competition, essay competition, conservation drawing and newsletter;
- Develop a package for the school students of the BZ for a tour to the Park, and conduct theme-based nature camp;
- Organize special day celebration through various conservation-awareness activities with the participation of all the stakeholders including the school students at local-level.



Chapter IX

Special Programme

9.1. Moderating the Climate Change Impact

9.1.1. Context

Climate change has impacted every walk of life on earth, and SNP can not be an exception. The potential impact of climate change on SNP is related to glacial hazards such as avalanches, debris-flow, GLOFs, glacial fluctuations and glacial surge. If appropriate measures are not taken to minimize the risk, the potential impact of climate change might have devastating impact both upon the flora and fauna of SNP and its Outstanding Universal Value. The melting of glaciers is affecting

upon the appearance of the sites inscribed for their outstanding beauty and destroying the habitat of rare wildlife species such as the snow leopard in the Park. These changes could also have disastrous effects on human lives with flooding resulting from the GLOFs threatening human settlements. The establishment of monitoring and early warning systems and the artificial draining of glacial-lakes are recommended to help avoid disasters (UNESCO, 2007).



Increasing atmospheric temperature is causing glaciers to melt worldwide. As far as mountain-glaciers are concerned, widespread retreats are being observed and will cause the melting of a number of glaciers, among which many are listed as World Heritage sites. The melting of glaciers has obvious consequences for the aesthetic values of these sites. Glacier melting leads to the formation of glacial lakes. The banks of such lakes are made of moraines (accumulated earth and stones deposited by the glacier) that may collapse when the lake fills up and may thus lead to sudden, violent flooding in the Valley. Any flood of this sort has disastrous consequences for the population and for the biodiversity of the entire region. Immediate disasters may be averted, however, by artificially draining the glacial lakes to avoid such outburst

floods. The annual melting of the mountain-glacier also drives the hydrological cycles of the entire region. The receding of the ice in the glacier-lake will lead to flash floods which in turn will cease water supply eventually leading to famine and pandemic disease in the region. Threats to terrestrial biodiversity mentioned above also apply to the mountain ecosystems. Shifts in tree-line are already being observed, and this mechanism poses an important threat to many mountainous species (UNESCO, 2007).

GLOFs occur relatively infrequently, but are the most hazardous flood risk in high mountains. There are over 1,466 glacial lakes in Nepal which are mostly formed in response to warming temperatures during the second half of the 20th

century. As the glaciers retreat, lakes start to form and fill up behind natural moraine or ice dams, when the water volume reaches a certain critical level beyond which the lakes can breach suddenly, leading to a discharge of huge volumes of water and debris. These sudden discharges are known as GLOFs. The studies have shown that there are 21 potentially dangerous glacial lakes in Nepal. GLOFs have been recorded 14 times in the Nepalese Himalayas, most recently in 2004. These outbursts had devastating consequences as in the case of Dig Cho in 1985 and Tam Pokhari in 1998 as a result of the large volume of discharged water and debris resulting in the destruction of downstream farmland, infrastructure, and villages (Bajracharya and Mool, 2009; ICIMOD, 2011)

In Sagarmatha region of Nepal, air temperatures had been rising by 1°C since 1970s, leading to 30% decrease in the snow and ice cover and turning a 4,000 m high glacier on the Mt. Everest into a lake. GLOFs are now much more frequent, creating serious risks for human populations and having implications for the water supply in South Asia and the flow of major rivers such as the Ganges, Indus and Brahmaputra (UNESCO, 2007). Recent climate changes have had a significant impact on the high-mountain glacial environment. These floods, usually of large magnitude, can severely affect upon fragile mountain ecosystems and their limited economic activities. The Imja Lake located at an altitude of 5,010 m in SNP is the largest and potentially most dangerous glacial lake in this region. The peak outburst flow of the Imja Lake is estimated to be 5,463 m³ per second. The peak discharge attenuates to about 2000 m³ per second at the boundary of the BZ at about 45 km from the outburst site. A GLOF vulnerability rating map has been prepared and an assessment of vulnerable settlements has also been carried out in this region, which is useful for developing plans for early warning systems and implementing management plans in the region (Bajracharya et al., 2007; Bajracharya and Mool, 2009).

After the Chhubung GLOF in the Rolwaling Valley, the mitigation work of lowering the level of the Tsho Rolpa Lake by 3 m was undertaken in 1998, and completed in 2000. After the successful implementation of Tsho Rolpa Lake lowering, the Imja Lake in Solukhumbu District was identified for reducing GLOF risk through artificial controlled drainage system. The CFGORRP/DHM Project has

been developed in line with the National Adaptation Programme of Action (NAPA) which was endorsed by the Government of Nepal in September 2010. The NAPA represents the most recent effort to assess and prioritize the most immediate climate change risks faced by Nepal. The CFGORRP/DHM addresses the objectives outlined in the NAPA Profile 3 “Community-based Disaster Management for Facilitating Climate Adaptation” and the NAPA Profile 4 “GLOF Monitoring and Disaster Risk Reduction”. The Imja Lake is among the 6 glacial lakes identified during the NAPA process as being the most “critical”, i.e. at most immediate risk of bursting (MoE, 2010).

9.1.2. Issues

The major issues of concern in the face of likely impact of climate change in SNP and its BZ are:

- The melting of glaciers around the Himalayas in the Everest region is affecting the appearance of the site inscribed for its outstanding universal value;
- 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.

9.1.3. Activities

Establishment of monitoring and early warning systems and the artificial draining of glacial lakes are the tested interventions in order to reduce the risk of GLOFs. Thus, the following activities are recommended in order to minimize the likely risks of GLOFs in the SNP and its BZ:

- Initiate monitoring the most dangerous glacial lakes of the region regularly to assess changes that could possibly cause GLOF events;
- Lower water level of the Imja Lake, the largest and potentially most dangerous glacial lake in the Khumbu region to reduce the potential GLOF risk through artificial channel construction;
- 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.

9.2. Enhancing the World Heritage Value

9.2.1. Context

SNP is an area of global significance as it is designated as a World Heritage Property for its outstanding universal value. The importance of the Park has been demonstrated recently by voices raised demanding placement of the SNP on the list of world heritage site in danger because its glaciers are continuing to shrink as a result of the failure of the International Communities to address global warming. Often, questions have been

raised locally as to whether the conservation and management measures adopted by the Park are adequate to meet world heritage site requirements and standards on an ongoing basis. The lack of a current management plan, inadequate staffing, lack of coordinated research and funding; and shortage of effective strategies to deal with the impacts of growing tourism pressure are issues of concern. Also, the local people and the visitors are not aware of the importance of the Park's world heritage status at present.



SNP is the first natural world heritage site of Nepal enlisted in the year 1979, and is among the most visited protected areas of the nation. However, very few local people and the foreign visitors know that this is one of the world heritage properties. Thus, there is a need of the WHS outreach program targeting the wider audiences.

9.2.2. Issues

The major issues of concern regarding the enhancement of OUV of the natural world heritage site are as follows.

- The WHS is in danger because of climate change and shrinking of glaciers which are not adequately addressed by the present conservation and management efforts;
- Garbage/pollution due to growing tourism pressure and development interventions is likely to degrade the value of WHS;

- The local people and the visitors are currently not fully aware of the importance of the WHS status of the Park.

9.2.3. Activities

- Install a world heritage plaque and flag at Namche, the Park Headquarters to raise public awareness and appreciation of the Park as world heritage property;
- Implement activities in order to safeguard and protect the natural and cultural values of the Park from unsympathetic developments and unmanaged tourism through planning, management and effective regulations;
- Implement activities in order to reduce the likely impact of climate change to safeguard the OUV of SNP;
- Conduct awareness raising activities regarding the world heritage and its significance;

- Coordinate with the concerned stakeholders in order to control the haphazard development within the property; and
- Strengthen the implementation of garbage management activities to keep Everest region clean and pollution free.

9.3. Coping with the Impact of Earthquake

9.3.1. Context

SNP and its BZ were badly affected from the devastating Earthquake of April, 2015 and the subsequent aftershocks. There was visible impact of the Earthquake on the Park infrastructure as most of the buildings and security posts were severely damaged. The list of the buildings damaged due to the devastating Earthquake of April, 2015 in SNP and its BZ is presented in Annex VIII. The PDNA has reported the damage to the buildings of the Park alone equivalent to more than Rs. 50 million (Annex-VII). Likewise, some community buildings and private houses were also damaged due to the Earthquake. Besides, there could be some sort of disruptions in the ecosystem and the ecological function and processes in this area, which has not been documented yet. The local communities in the SNP and its BZ have demonstrated that they are more resilient to the damage caused by natural

disasters such as earthquake as they experienced relatively less physical damage to their properties due to the devastating Earthquake of April, 2015; most of them have already reconstructed their houses after the Earthquake.

9.3.2. Issues

- Damage caused by earthquake to the buildings and other infrastructures including trekking trails, bridges, culverts and the Interpretation Center of the Park;
- Damage to the community infrastructures and private properties in SNP and its BZ;
- Disruptions in the ecosystem and the ecological functions and processes: not yet documented;
- Building codes to construct earthquake-resilient buildings in SNP and its BZ: not followed properly;
- Inadequate construction materials available for the households damaged in SNP and its BZ.

9.3.3. Activities

- Reconstruct the severely-damaged buildings and the security posts, and maintain the buildings and the security posts with minimal damage in the Park;



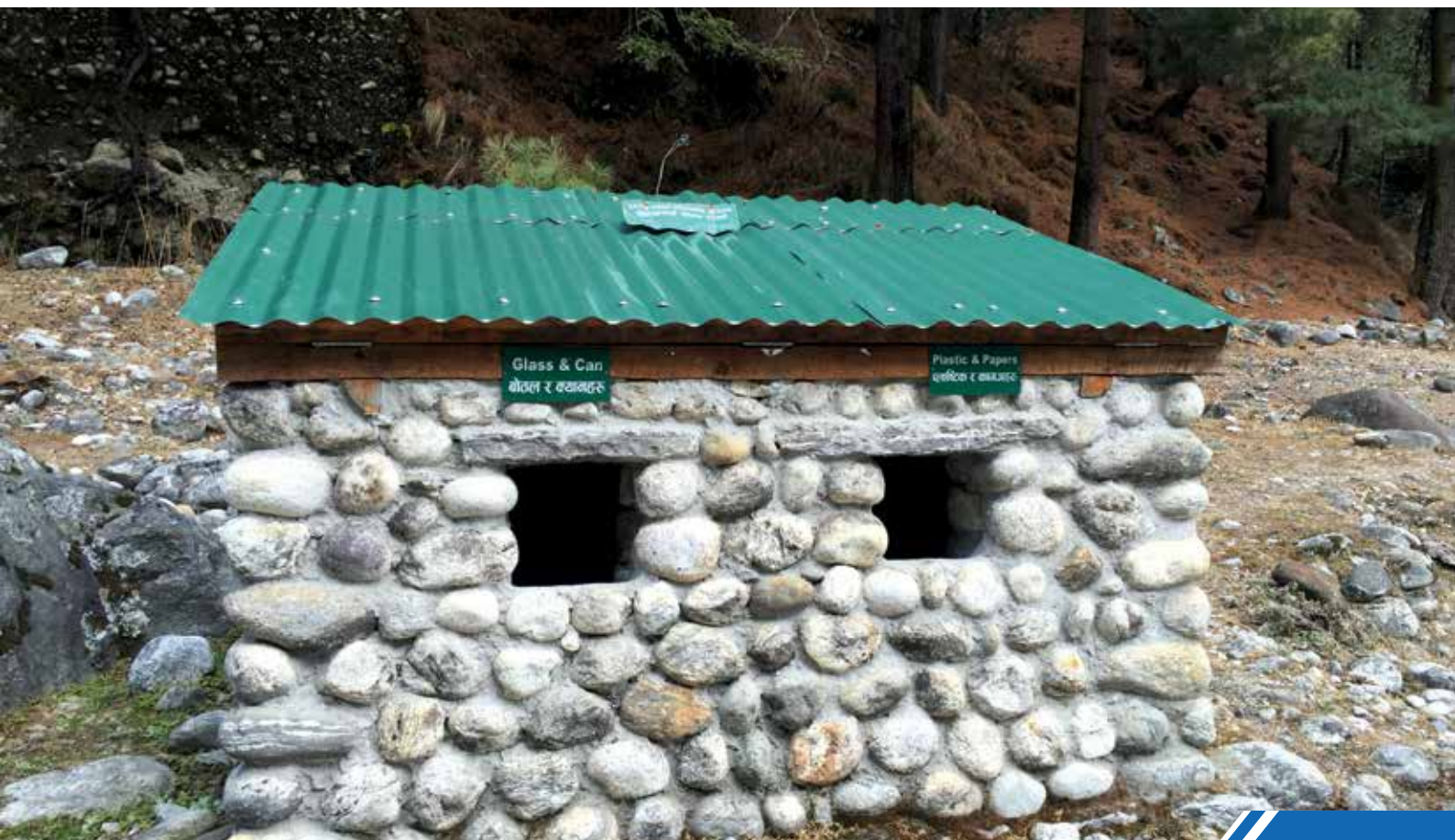
- Assess the impact of the devastating earthquake on the wildlife species, the ecosystem as well as the ecological function and processes in SNP;
- Implement the building codes developed by the GoN to promote earthquake-resistant building construction in SNP and its BZ;
- Maintain the major trekking routes including the damaged bridges and culverts in the SNP and its BZ;
- Reconstruct the Visitor Center at Namche, and upgrade the Center to a well-equipped Interpretation Center;
- Provide support to reconstruct the community infrastructures damaged by the earthquake;
- Provide construction materials such as timber, stone, sand, and gravel from appropriate sites to reconstruct private buildings in SNP and its BZ.

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

9.4. Keeping Everest Region Clean

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



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).

Active litter collection in the Everest Region was started by the different cleaning expeditions and groups whereas SNP introduced regulations to prevent pollution. Sagarmatha Pollution Control Committee (SPCC) was formed in 1990, which continues to play a role in managing waste in SNP and its BZ. Despite these measures, the waste management problem including crashed helicopter and aircrafts 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 long-run.

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 the Everest region 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 the stakeholders;
- Inadequacy of coordinated effort to address the issue of garbage and pollution in the Everest region;

- Lack of guidelines for properly managing the garbage; and
- Inadequacy of the fund required for maintaining sanitation in the Everest region;

9.4.3. Activities

- Support SPCC to institutionalize it as the source of expertise;
- 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;
- Develop a Community-based Museum and Information Center on garbage management in order to demonstrate proper techniques of garbage disposal and recycling techniques to the stakeholders;
- Develop standard sets of sanitation guidelines for all the hotels/lodges and restaurants to construct proper toilets with leak proof septic tanks and waste water soakage pits so as to prevent contamination;
- Encourage establishment of high quality hygienic “user-pay” toilets and bath-room facilities in the private lands along the main trekking routes;
- Develop a joint financing mechanism for pollution control and management;
- Coordinate with the Department of Tourism, Nepal Tourism Board and other stakeholders to monitor the waste management practices by the tourism entrepreneurs in SNP and its BZ; and
- Explore the sources of sustainable financing for garbage management in the Everest region.

Chapter X

Buffer Zone Management

10.1. Introduction

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 in 1993. Buffer zone is an area surrounding a park or a reserve encompassing forests, agricultural lands, settlements, village open spaces and any other

land use. The buffer zone programme in Nepal is a major strategy to protect the core area of the park through community-based natural resource management in its periphery. The National Parks and Wildlife Conservation Act 1973, Buffer Zone Regulations, 1996 and Buffer Zone Guidelines, 1999 provide policy and legal framework for buffer zone management in Nepal.



An area of 275 km² around SNP has been declared as its BZ in 2002. The BZ of SNP comprises of the population of over 7,500 spread over the 3 VDCs of the Solukhumbu district. The BZ communities are the principal stakeholders. SNP has institutionalized mechanisms in its BZ to mobilize funds, minimize biotic pressures in the Park resources, and motivate

communities in the participatory management of the forest resources to fulfil their basic needs of forest products. The Buffer Zone Management Committee (BZMC) is an apex body under which 3 Buffer Zone User Committees (BZUCs), and 28 Buffer Zone User Groups (BZUGs) have been formed and institutionalized in SNP and its BZ.

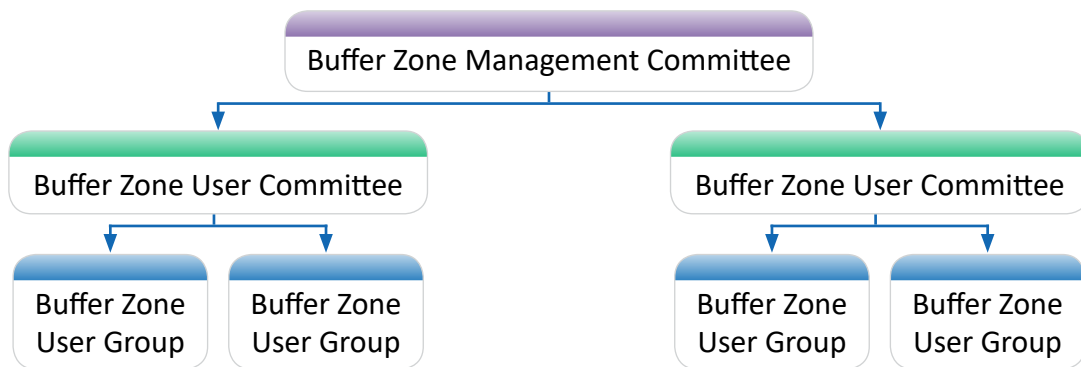


Figure 11. Organizational Structure of Buffer Zone

The long-term objective of the buffer zone programme is to motivate the local people and to garner 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 of conservation and community development programmes. The BZ programmes are aimed at institutional development, alternative natural resource development, capacity building, financial management, conservation education and awareness, and gender and special target group mainstreaming. In fact, the BZ programme

is a benefit sharing mechanism which involves sustainable development, tourism promotion and reconciliation of the park-people interface.

The buffer zone of SNP has also received up to 50% of the revenue generated by the Park for conservation and socio-economic development annually. The BZMC has to allocate 30% of its budget for conservation, 30% for community development, 20% for income generation and skill development, 10% for conservation education and the rest 10% for administrative expenses (see Figure 12 below).

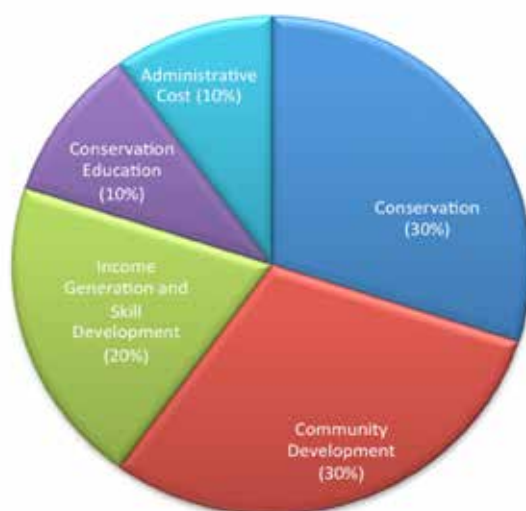


Figure 12. Allocation of the budget of Buffer Zone for different categories of activities

One of the major programmes of the buffer zone management is to develop alternative forest resource in the buffer zone through community forestry. Thus, the buffer zone programme of SNP emphasizes on sustainable management and development of the forests through involvement of the 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, SNP has handed over a total of 3,839 ha forest to 9 BZCFUGs consisting of 940 households for development, conservation, management and sustainable use of the forest resources.

10.2. Past Management and Present Practices

10.2.1. Forest management

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

buffer zone forest in the Chaurikharka VDC has been managed as Buffer Zone Community Forest. Before the declaration, there was no special arrangement for wildlife management. But, at present, the buffer zone is viewed in terms of wildlife conservation, 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 Uses

The major land uses in the BZ of SNP are human settlements and agricultural lands other than forested areas. There are few tourism villages coming up in the area while the trekking trails and electricity transmission lines have been seen as major developmental changes in these areas.

10.3. Management Strategies

10.3.1. Zonation

The area of the BZ of SNP has been duly notified and clearly delineated. For management purpose, it will be further divided into conservation zone, sustainable use zone and intensive use zone.

10.3.1.1. Conservation Zone

The large forest patches in the BZ in Chaurikharka VDC, is equally good as core area for wildlife. Thus, these areas will be basically managed as extended wildlife habitat where extraction of forest products will be restricted, but the area will be allowed for regulated tourism activities if needed.

10.3.1.2. Sustainable Use Zone

The forested area, within the BZ, managed by the local communities for dual purpose of meeting the need of forest products for the households and providing shelter for the dispersing population of wildlife falls under this category of zonation.

10.3.1.3. Intensive Use Zone

This is the area, within the BZ, including all the settlements and private lands, where environment-

friendly development activities will be carried out to enhance the livelihood of the local people living in the area through various developmental inputs.

10.3.2. Community Development

Need-based and site specific inputs for the socio-economic development in the BZ is targeted to reduce the dependency of the local people on forest resources. The management of the BZ is oriented towards garnering support from the local people through need-based socio-economic development input and participatory forest management for fulfilling their forest-product needs. The site-specific plans consisting of the livelihood support programmes will be the guiding documents for implementing developmental initiatives for the respective user committees and groups.



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 biodiversity conservation. The involvement and active participation of the local people is the main thrust of biodiversity conservation not only in buffer zone but also in core area. The local 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

The promotion of community-based eco-tourism in buffer zone is a means of sustainable livelihoods for the people living there. The BZ of SNP has its own tourism potential, and there are several resorts and

facilities targeted to tourists; however, there are only few tourism attractions in buffer zone. Thus, potential areas will be explored in SNP and its BZ for tourism promotion in days to come.

10.3.5. Functional coordination

The plan for each UC/UG will be prepared through bottom-up planning process. Participation of women and underprivileged communities will be ensured in planning and implementation. 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. Prior to approval, the provision for reviewing the plan by the BZMC will be made for its refinement and aligning the activities to be supported by other line agencies.



10.3.6. Capacity building

Park staff need to be trained in facilitation skill and participatory approaches. The frontline staff need training in handling the basic field instruments used in wildlife management, and in-house orientation training in participatory management. The detailed HRD activities will be planned to include in-house workshops, training and other capacity building courses, lecture by resource persons, improvement of skills to positively change the staff's perceptions and improve their professionalism in the park-people cooperation and participatory management.

10.3.7. Conflict minimization

The reduction of human-wildlife conflict arising in the buffer zone of any park is of primary importance to ensure the cordial relation between the park and people. Human-wildlife conflict is not a pronounced issue in the case of the BZ of SNP. However, there are few reported cases of wildlife-damage recorded

in the BZ. The crop depredation by Himalayan tahr is a management issue in the BZ over the period.

10.3.8. Income generation and skill development

In order to reduce the dependency of the local people in the Park resources and at the same time to uplift their standard of living, income generation and skill development activities targeted towards the marginalized communities will be carried out. The fund of the BZ will be made available to conduct these programmes.

10.3.9. Conservation Education

In order to develop positive attitude of the local people in conserving biodiversity, several programmes will be conducted focusing on different profiles of the society, e.g. school children, mother groups, social activists. The resource will be available from the BZ fund and also from the Park itself as well.



10.3.10. 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 in the BZ of SNP.

10.4. Implementation and mainstreaming Strategy

For the effective implementation of the Plan, all the programmes will be implemented through the User Committees. The basic implementation strategy will be:

- Ensure participation of all the concerned stakeholders;

- Follow the good governance practices, maintain transparency and well-informed decisions;
- Promote green development in the BZ through organic farming, use of biogas in the lower parts of Chaurikharka together with plantation and other eco-friendly technologies that reduce carbon footprint; and
- Capacity building for institutional sustainability.

The mainstreaming strategies in the BZ will include protection of wildlife, management of wildlife habitats, regular monitoring of wildlife species, regulation for collection of forest products and livestock grazing, conflict minimization and providing relief for the damage caused by wildlife.





Chapter XI

Activities, Budget and Logical Framework

11.1. Activities and Budget

The estimated budget required for the implementation of the activities prescribed in the Plan for the period of five years between 2016 and 2020 is presented in the Annex IX. The activities for buffer zone management were planned on the basis of the activities proposed during the consultative meetings of the different BZUCs (see Annex X). The summary of the activities and budget is presented in the Table 4 below:

Table 4. Activities and budget for the Management Plan of the SNP and its BZ for the period 2016–2020

Amount in Thousand Nepalese Rupees

Activities	Total Budget	Budget Breakdown				
		Year I	Year II	Year III	Year IV	Year V
1. Biodiversity Conservation						
1.1 Park zonation	1100	0	600	300	100	100
1.2 Park and security posts	50500	20000	16500	8000	3000	3000
1.3 Intelligence network	3200	700	600	600	700	600
1.4 Park patrolling	5700	1540	1040	1040	1040	1040
1.5 Species conservation activities	6500	1200	1700	1200	1200	1200
1.6 GLOF risk mitigation	264740	132740	130500	500	500	500
1.7 Rangeland management	950	0	150	500	150	150
1.8 Wetland management	1800	300	900	300	0	300
1.9 Fire management	1750	330	530	330	230	330
1.10 Enhancing world heritage value	1700	100	1100	100	300	100
1.11 Reconstruction after earthquake	46500	26000	19500	1000	0	0
1.12 Wildlife health management	2000	400	400	400	400	400
Sub-total	386440	183310	173520	14270	7620	7720
2. Tourism promotion and culture conservation						
2.1 Trekking route management	11150	0	850	3000	4150	3150
2.2 Facilities development for visitors	58400	300	28900	26400	1400	1400
2.3 Sanitation in the Everest region	30000	11200	12200	2200	2200	2200
2.4 Tourism promotion/diversification	3300	0	800	1500	500	500
2.5 Culture conservation	11500	1000	1000	6500	1500	1500
Sub-total	114350	12500	43750	39600	9750	8750
3. Buffer Zone Management						
3.1 Conservation program	58500	10500	10500	12000	12000	13500
3.2 Community development	58500	10500	10500	12000	12000	13500
3.3 Income generation and skill development	39000	7000	7000	8000	8000	9000
3.4 Conservation education	19500	3500	3500	4000	4000	4500
3.5 Administrative cost	19500	3500	3500	4000	4000	4500
Sub-total	195000	35000	35000	40000	40000	45000

Activities	Total Budget	Budget Breakdown				
		Year I	Year II	Year III	Year IV	Year V
4. Institutional Development						
4.1 Monitoring, survey and research	9000	1100	2100	2100	1600	2100
4.2 Capacity building	2000	200	600	550	400	250
4.3 Coordination and collaboration	2400	300	500	800	500	300
4.4 Special day celebration	1750	350	350	350	350	350
4.5 Extension for biodiversity conservation	1840	330	225	730	325	230
4.6 Monitoring and evaluation	1750	350	350	350	350	350
Sub-total	18740	2630	4125	4880	3525	3580
Grand Total	714530	233440	256395	98750	60895	65050

11.2. Logical Framework Analysis

The logical framework of the SNP and its BZ Management Plan for five-year period 2016–2020 is presented in Annex I.

11.3. Gender Equity and Social Inclusion

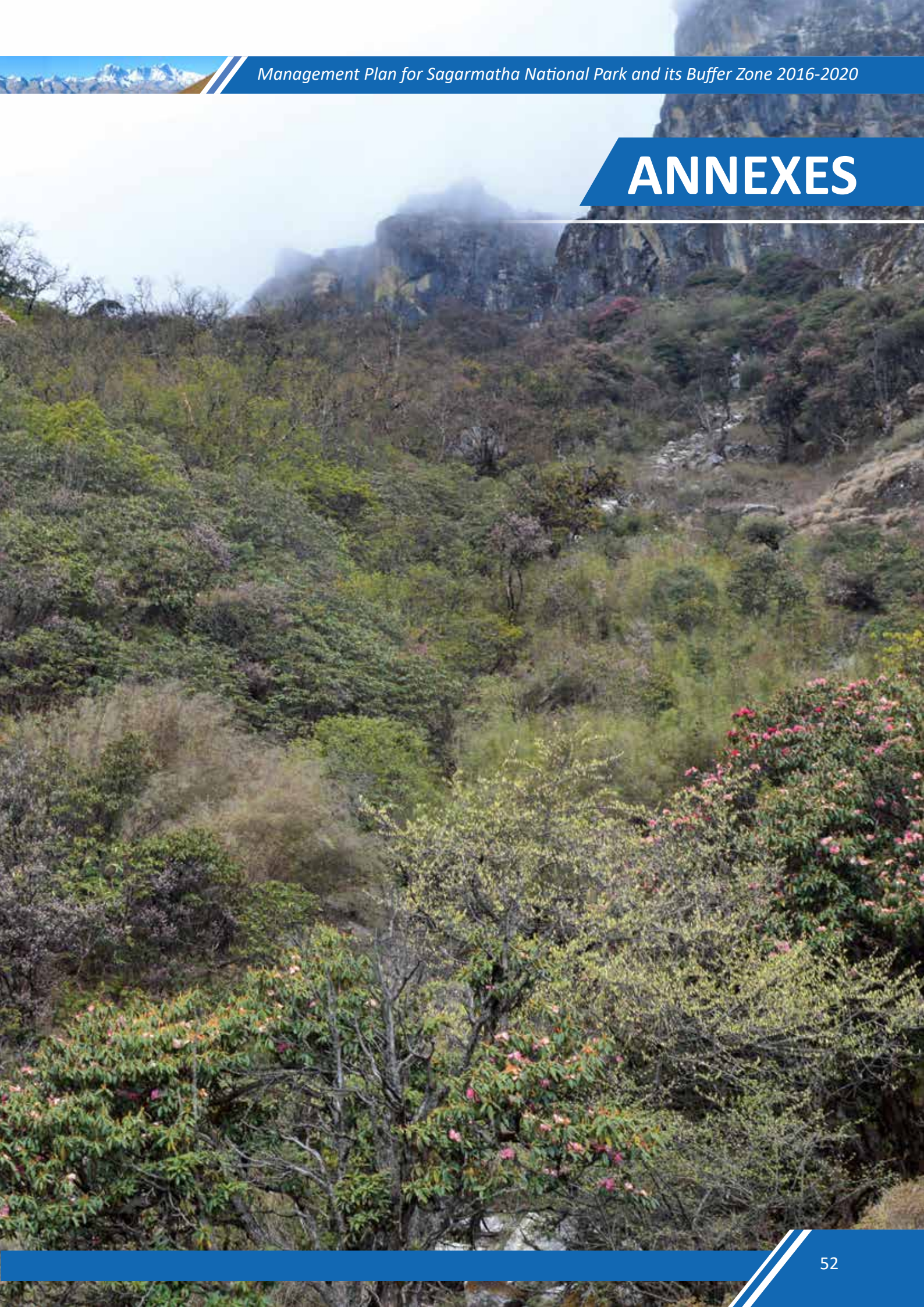
Participation of women and underprivileged community will be ensured in planning and implementation of the BZ programs. In order to prioritize the needs and support to be provided, participatory ranking of the users will be done based on their well-being and proximity of the settlements to the National Park. Priority will be given to the users residing in the off-route villages for supporting them to develop livelihood improvement plan preparation and its implementation.

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ANNEXES





Annex I

Logical Framework of the Management Plan of SNP and its BZ for the Five-year Period 2016–2020

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
Goal			
Enhanced biodiversity and maintained outstanding universal value of the National Park that eventually supports for the welfare of human being in perpetuity	<ul style="list-style-type: none"> ▪ Enhanced diversity richness and status of endangered species ▪ Increased value of the SNP and its BZ ▪ Improved living standard of the local communities 	<ul style="list-style-type: none"> ▪ National inventory reports ▪ ICIMOD, WWF and IUCN reports ▪ Human Development reports ▪ Living standard survey reports 	<ul style="list-style-type: none"> ▪ Supportive policy and priority of the country ▪ No natural calamities
Purpose			
1. 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 and processes	<ul style="list-style-type: none"> ▪ Increased sighting frequency of snow leopard ▪ Increased population of musk deer, red panda and Himalayan tahr ▪ Reduced poaching of musk deer ▪ Improved key habitat in the Park 	<ul style="list-style-type: none"> ▪ SNP and DNPWC annual reports ▪ Wildlife monitoring reports ▪ Media reports ▪ Satellite data analysis 	<ul style="list-style-type: none"> ▪ Adequate budget and staff to implement the Park management activities
2. Promote sustainable tourism and regulate it for maintaining ecological integrity and cultural heritage	<ul style="list-style-type: none"> ▪ Increased visitors' satisfaction ▪ Enhanced employment opportunities 	<ul style="list-style-type: none"> ▪ Visitors survey reports ▪ Economic survey reports 	<ul style="list-style-type: none"> ▪ Conservation-friendly tourism promotion
3. Enhance public stewardship on biodiversity conservation by increasing awareness and improving livelihood of the people living in the buffer zone	<ul style="list-style-type: none"> ▪ Increased awareness ▪ Enhanced conservation-friendly livelihood opportunities 	<ul style="list-style-type: none"> ▪ SNP and BZ reports ▪ Media reports 	<ul style="list-style-type: none"> ▪ Communities are unified and positive to cooperate
4. Strengthen institutional capacity through research, capacity building, coordination and collaboration	<ul style="list-style-type: none"> ▪ Updated database ▪ Enhanced protection and conservation services ▪ Increased joint venture activities, projects and programmes 	<ul style="list-style-type: none"> ▪ Research reports ▪ HRD reports ▪ Media reports ▪ DNPWC reports and records of correspondence 	<ul style="list-style-type: none"> ▪ Effective coordination, collaboration and networking with the stakeholders

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
Output 1			
1.1. Population of key wildlife species such as snow leopard, musk deer, red panda, Himalayan black bear and Himalayan tahr maintained	<ul style="list-style-type: none"> ▪ Increased population of snow leopard, musk deer, red panda, Himalayan black bear and Himalayan tahr 	<ul style="list-style-type: none"> ▪ Wildlife monitoring reports ▪ Research reports 	
1.2. Status of key wildlife species such as snow leopard, musk deer, red panda, Himalayan black bear and Himalayan tahr updated	<ul style="list-style-type: none"> ▪ Updated database of key wildlife species 	<ul style="list-style-type: none"> ▪ Wildlife monitoring reports ▪ Research reports 	
1.3. Poaching of wildlife species controlled	<ul style="list-style-type: none"> ▪ Reduced poaching of musk deer and other wildlife 	<ul style="list-style-type: none"> ▪ SNP progress reports ▪ Media reports 	
1.4. Rangeland condition improved	<ul style="list-style-type: none"> ▪ Critical rangeland identified ▪ Livestock grazing regulated 	<ul style="list-style-type: none"> ▪ Assessment report ▪ Monitoring report 	
1.5. Status of wetland enhanced	<ul style="list-style-type: none"> ▪ Key wetlands identified and mapped ▪ Pollution and encroachment in wetlands controlled ▪ Public awareness on wetland conservation raised 	<ul style="list-style-type: none"> ▪ SNP progress reports ▪ Report submitted to RAMSAR Secretariat ▪ Field reports 	
1.6. World heritage value of the park enhanced	<ul style="list-style-type: none"> ▪ Visitors' response ▪ Public awareness on world heritage ▪ Interpretation facilities regarding WHS ▪ Media coverage 	<ul style="list-style-type: none"> ▪ Visitors survey report ▪ Opinion of the local communities ▪ Online and other media ▪ Reports submitted to the WHC 	
1.7. GLOF risk to the SNP and its BZ minimized	<ul style="list-style-type: none"> ▪ Construction of artificial channel to reduce water level of the Imja Lake to reduce the likely impact of GLOF completed ▪ Early warning system established 	<ul style="list-style-type: none"> ▪ SNP progress reports ▪ Project reports ▪ Media reports 	

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
Output 2			
2.1. Detrimental effects of tourism to the Park reduced	<ul style="list-style-type: none"> ▪ Change in pollution level ▪ Management of non-degradable garbage 	<ul style="list-style-type: none"> ▪ SNP progress report ▪ SPCC progress report ▪ Observation report 	
2.2. Wilderness of the Park maintained	<ul style="list-style-type: none"> ▪ Crowding avoided in peak seasons ▪ Wildlife sightings along trekking routes 	<ul style="list-style-type: none"> ▪ Tourist records maintained in the Park Office ▪ Observation report 	
2.3. Cultural heritage of the area conserved	<ul style="list-style-type: none"> ▪ Number of renovated monasteries ▪ Number of cultural events organized 	<ul style="list-style-type: none"> ▪ Records at monasteries ▪ SNP and its BZ progress reports 	
2.4. Tourism in the SNP and its BZ diversified	<ul style="list-style-type: none"> ▪ Number of tourism activities available ▪ Number of visitors ▪ Days spent by visitors in SNP 	<ul style="list-style-type: none"> ▪ SNP progress report ▪ Tourism Office report ▪ Visitors survey 	
2.5. Interpretation facilities at the SNP enhanced	<ul style="list-style-type: none"> ▪ Number of interpretation centers ▪ Number of trained Nature Guides 	<ul style="list-style-type: none"> ▪ SNP progress report ▪ Observation report 	
2.6. IT-based system for visitors management in the SNP introduced	<ul style="list-style-type: none"> ▪ Online ticketing system ▪ Visitors tracking system 	<ul style="list-style-type: none"> ▪ SNP progress reports ▪ Project reports ▪ Observation report 	
2.7. Benefit to the local communities through employment and income opportunity increased	<ul style="list-style-type: none"> ▪ Change in income ▪ Employment in tourism sector 	<ul style="list-style-type: none"> ▪ Participatory well-being ranking reports ▪ Economic survey 	
Output 3			
1.1. Awareness level of the local communities regarding biodiversity conservation raised	<ul style="list-style-type: none"> ▪ Participation of the local people in conservation ▪ Support from the local communities in controlling illegal activities in the Park and buffer zone 	<ul style="list-style-type: none"> ▪ SNP and its BZ progress reports ▪ Case study reports ▪ Research reports 	
1.2. Physical infrastructure in the SNP and its BZ developed	<ul style="list-style-type: none"> ▪ Physical facilities in the SNP and its BZ ▪ Condition of the physical infrastructures 	<ul style="list-style-type: none"> ▪ SNP and its BZ progress reports ▪ Work completion report 	

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
1.3. Alternative energy in the SNP and its BZ promoted	<ul style="list-style-type: none"> ▪ Number of micro hydro projects in operation ▪ Households using firewood energy for heating and cooking 	<ul style="list-style-type: none"> ▪ SNP and its BZ progress reports ▪ Household survey report 	
1.4. Participation of the local communities in conservation and community development increased	<ul style="list-style-type: none"> ▪ Number of community meetings ▪ Community-based anti-poaching activities ▪ Volunteer contribution for community development 	<ul style="list-style-type: none"> ▪ SNP and its BZ progress reports ▪ Media coverage ▪ Field reports 	
1.5. Income of the local communities through conservation-friendly livelihood activities increased	<ul style="list-style-type: none"> ▪ Household income ▪ Employment generated 	<ul style="list-style-type: none"> ▪ Economic survey report ▪ SNP and its BZ progress reports 	
1.6. Resilience of buffer zone community to cope with the likely impact of climate change enhanced	<ul style="list-style-type: none"> ▪ Early warning system related to GLOF risk ▪ Institutionalization of GLOF risk management coordination committee ▪ Trained human resource and physical infrastructure to minimize GLOF risk 	<ul style="list-style-type: none"> ▪ SNP and its BZ progress reports ▪ Media reports ▪ Meeting records 	
Output 4			
1.1. Research finding incorporated in park and BZ management	<ul style="list-style-type: none"> ▪ Priority areas of research in SNP and BZ known to stakeholders ▪ Research unit in SNP ▪ Documentation of research reports 	<ul style="list-style-type: none"> ▪ SNP and BZ progress report ▪ Research reports ▪ Monitoring reports 	
1.2. Technical and managerial capacity of the Park Staff and the stakeholders enhanced	<ul style="list-style-type: none"> ▪ Number of trainings conducted ▪ No. of persons involved 	<ul style="list-style-type: none"> ▪ SNP progress report ▪ Post training assessment reports 	
1.3. Collaboration and cooperation with stakeholders strengthened	<ul style="list-style-type: none"> ▪ Number of coordination meetings with stakeholders ▪ Support for conservation from stakeholders 	<ul style="list-style-type: none"> ▪ SNP and BZ progress report ▪ Evaluation report 	

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
1.4. Trans-boundary cooperation with TAR enhanced	<ul style="list-style-type: none"> ▪ Number of trans-boundary meetings ▪ Status of illegal cross border trade of wildlife parts 	<ul style="list-style-type: none"> ▪ SNP and BZ progress report ▪ Evaluation report ▪ Media report 	
Activities			Budget (Rs.)
1. Biodiversity conservation <ol style="list-style-type: none"> 1.1. Complete Park zonation using GIS, and manage the specified zone accordingly 1.2. Construct and upgrade park and security posts in order to ensure protection of the Park 1.3. Establish and operate intelligence network to control poaching and wildlife crime 1.4. Surveillance through regular patrolling effort, sweeping and camping operations and SMART patrolling 1.5. Status update and management of key wildlife species (Snow leopard, Himalayan musk deer, Red panda) 1.6. Establish automated early warning system, and construct artificial channel to lower the water level of the Imja Lake by 3 meters to minimize the potential GLOF risk 1.7. Manage rangelands in order to reduce anthropogenic pressures, and avoid competition between livestock and wildlife species 1.8. Identification, mapping and management of key wetlands 1.9. Mobilize staff and community for fire management in the SNP in order to minimize damage from accidental fires 1.10. Raise awareness on World Heritage value of the Park 1.11. Reconstruction of the Park infrastructures after the damage by the devastating earthquake of April, 2015 1.12. Establish mechanism for wildlife health assessment 			38,64,40,000
2. Tourism promotion and culture conservation <ol style="list-style-type: none"> 1.1. Upgrade the existing trekking routes including bridge and culvert maintenance in the SNP 1.2. Feasibility study for alternative trekking route from Lukla to Namche 1.3. Initiate campaign to limit the road construction work at Surke to safeguard the OUV of the SNP from further deterioration 1.4. Feasibility study to develop ropeway system from Surke to Namche to promote a better system for transportation of materials 1.5. Upgrade and manage the existing Helipads in the SNP 1.6. Establish and operate Counter of the SNP at the Lukla Airport 1.7. Institutionalize the pollution control and solid waste management activities to maintain sanitation in the Everest region 1.8. Develop and empower the Nature Guides to provide quality nature interpretation services to the visitors 1.9. Reconstruct the Visitors Center at Namche to upgrade the Center to a well-equipped Nature Interpretation Center 1.10. Initiate e-ticketing from the Counters at the entry points of the SNP 1.11. Explore potential for tourism promotion/diversification 1.12. Conserve and promote cultural heritage 			11,43,50,000

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
3. Buffer zone management 1.1. Conservation of natural resources in the BZ with active participation of the local communities 1.2. Nursery operation and seedling production 1.3. Seedling plantation in the buffer zone 1.4. Alternative energy promotion: micro-hydro power 1.5. Gazing management in rangelands 1.6. Regulated collection of forest products 1.7. Physical infrastructure development in the buffer zone: bridge/culvert, school buildings, community buildings and trekking trail 1.8. Support the local institutions for institutional strengthening 1.9. Conduct awareness raising activities through mass media 1.10. School program for conservation education 1.11. Skill development training 1.12. Support for income generation activities			19,50,00,000
4. Institutional development 1.1. Monitoring of key wildlife species (Snow leopard, Musk deer, Red panda, Himalayan black bear and Himalayan tahr) 1.2. Status survey of migratory birds in the SNP 1.3. Research on wildlife, its habitat and impact of climate change on biodiversity 1.4. Capacity building trainings: GPS, GIS, Animal handling techniques, SMART patrolling techniques, orientation on biodiversity conservation to protection unit 1.5. Special day celebration- Park establishment Day, Wetland Day, Biodiversity Day, Wildlife Week and Environment Day 1.6. Extension for conservation awareness: Calendar, Booklets, documentary on the SNP as a world heritage site and radio program 1.7. Coordination and collaboration: Local level, district level, national level and landscape level, and trans-boundary meetings			1,87,40,000
Total budget			71,45,30,000



Annex II

List of mammals recorded in the SNP and its BZ

S N	Family	Scientific Name	Common Name	Status			
				NRDB, NPWC	IUCN	CITES	Range
1	Ailuridae	<i>Ailurus fulgens</i>	Red Panda	E,P	EN	I	2800-3900
2	Bovidae	<i>Bos grunniens</i>	Wild Yak	C,P	EN	I	4115-6100
3	Bovidae	<i>Hemitragus jemlahicus</i>	Himalayan Tahr	S	VU		2500-4400
4	Bovidae	<i>Naemorhedus goral</i>	Goral	S	LR/NT	I	
5	Bovidae	<i>Naemorhedus sumatraensis</i>	Mainland Serow	S	VU	I	
6	Canidae	<i>Canis aureus</i>	Golden Jackal	S	LC	III	Up to 4000
7	Canidae	<i>Canis lupus</i>	Grey Wolf	V,P	LC	I	3600-5150
8	Canidae	<i>Cuon alpinus</i>	Wild Dog	V	VU	II	
9	Canidae	<i>Vulpes montana</i>	Mountain Fox	S	LC	III	
10	Cercopithecidae	<i>Macaca mulatta</i>	Rhesus Monkey	S	LR/NT	II	Up to 2900
11	Cercopithecidae	<i>Presbytis entellus</i>	Langur	S	LR/NT	I	Up to 3600
12	Cervidae	<i>Muntiacus muntjak</i>	Barking Deer		LC		
13	Felidae	<i>Panthera pardus</i>	Common Leopard	S	LC	I	Up to 2800
14	Felidae	<i>Uncia uncia</i>	Snow Leopard	E,P	EN	I	3500-5600
15	Leporidae	<i>Lepus oiostolus</i>	Woolly Hare		LC		Up to 4300
16	Moschidae	<i>Moschus chrysogaster</i>	Musk Deer	E,P	LR/NT	I	Up to 3000
17	Moschidae	<i>Moschus fuscus</i>	Musk Deer	E,P	LR/NT	II	Up to 3000
18	Muridae	<i>Alticola roylei</i>	Royal's Vole		NT		
19	Muridae	<i>Alticola strachey</i>	Khumbu Vole				
20	Muridae	<i>Mus musculus</i>	House Mouse		LC		Up to 4300
22	Muridae	<i>Pitymys sikimensis</i>	Alpine Vole		LC		2100-3700
23	Muridae	<i>Rattus rattus</i>	House Rat		LC		Up to 4300
24	Mustelidae	<i>Mustela flavigula</i>	Yellow-throated Marten	S	LC	III	Up to 3000
25	Mustelidae	<i>Mustela kathiah</i>	Yellow-bellied Weasel	S	LC	III	Up to 36600
26	Mustelidae	<i>Mustela sibirica</i>	Siberian Weasel	S	LC	III	1525-4880
27	Ochotonidae	<i>Ochotana macrotis</i>	Long-eared Pika		LC		
28	Ochotonidae	<i>Ochotana roylei</i>	Himalayan Mouse-hare		LC		2000-3700
29	Pteropidae	<i>Cyanoptera sphinx</i>	Short-nosed Fruit Bat		LC		1000-3050
30	Rhinolophidae	<i>Hipposideros armiger</i>	Himalayan Leaf-nosed Bat				upto 3050
31	Sciuridae	<i>Marmota bobak</i>	Himalayan Marmot	S	LC	III	3960-5500
32	Soricidae	<i>Chimarrogale himalayica</i>	Himalayan Water Shrew		LC		upto 1500
33	Soricidae	<i>Nectogale elegans</i>	Elegant Water Shrew		LC		upto 2270
34	Soricidae	<i>Soriculus caudatus</i>	Brown Toothed Shrew		LC		1800-3600
35	Talpidae	<i>Talpa micrura</i>	Himalayan Mole				1000-3000
36	Ursidae	<i>Ursus thibetanus</i>	Himalayan Black Bear	V	VU	I	1000-3000
37	Viverridae	<i>Paguma larvata</i>	Masked Palm Civet	S	LC	III	200-2200

Status

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

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

Annex III

List of birds recorded in the SNP and its BZ

SN	Family	Scientific Name	Common Name
1	Accipitridae	<i>Accipiter gentilis</i>	Northern Goshawk
2	Accipitridae	<i>Accipiter nisus</i>	Eurasian Sparrowhawk
3	Accipitridae	<i>Accipiter virgatus</i>	Besra
4	Accipitridae	<i>Aegypius monachus</i>	Cinereous Vulture
5	Accipitridae	<i>Aquila nipalensis</i>	Steppe Eagle
6	Accipitridae	<i>Aquila chrysaetos</i>	Golden Eagle
7	Accipitridae	<i>Aquilla heliaca</i>	Imperial Eagle
8	Accipitridae	<i>Buteo buteo</i>	Common Buzzard
9	Accipitridae	<i>Buteo rufinus</i>	Long-legged Buzzard
10	Accipitridae	<i>Circus cyaneus</i>	Hen Harrier
11	Accipitridae	<i>Gypaetus barbatus</i>	Lammergeir
12	Accipitridae	<i>Gyps himalayensis</i>	Himalayan Griffon
13	Accipitridae	<i>Hieraetus pennatus</i>	Booted Eagle
14	Accipitridae	<i>Milvus migrans</i>	Black Kite
15	Accipitridae	<i>Pandion haliaetus</i>	Osprey
16	Aegithalidae	<i>Aegithalos iouschistos</i>	Rufous-fronted tit
17	Alaudidae	<i>Alauda gulgula</i>	Oriental Skylark
18	Alaudidae	<i>Calandrella acutirostris</i>	Hume's Short-toe Lark
19	Alaudidae	<i>Calandrella brachydactyla</i>	Greater Short-toed Lark
20	Alaudidae	<i>Eremophila alpestris</i>	Horned Lark
21	Anatidae	<i>Anas acuta</i>	Northern Pintail
22	Anatidae	<i>Anas clypeata</i>	Northern Shoveler
23	Anatidae	<i>Anas crecca</i>	Common Teal
24	Anatidae	<i>Anas penelopa</i>	Eurasian Wigeon
25	Anatidae	<i>Anas querquedula</i>	Garganey
26	Anatidae	<i>Anas strepera</i>	Gadwall
27	Anatidae	<i>Anser indicus</i>	Bar-headed Goose
28	Anatidae	<i>Aythya ferina</i>	Common Pochard
29	Anatidae	<i>Aythya fuligula</i>	Tufted duck
30	Anatidae	<i>Aythya nyroca</i>	Ferruginous Pochard
31	Anatidae	<i>Bucephala clangula</i>	Common Goldeneye
32	Anatidae	<i>Tadorna ferruginea</i>	Ruddy Shelduck
33	Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift
34	Apodidae	<i>Collocalia brevirostris</i>	Himalayan Swiftlet
35	Certhiidae	<i>Certhia familiaris</i>	Eurasian Tree-creeper
36	Certhiidae	<i>Certhia nipalensis</i>	Rusty-flanked Tree-creeper
37	Certhiidae	<i>Troglodytes troglodytes</i>	Winter Wren

SN	Family	Scientific Name	Common Name
38	Charadriidae	<i>Ibidorhyncha struthersii</i>	Ibisbill
39	Cinclidae	<i>Cinclus cinclus</i>	White-throated Dipper
40	Cinclidae	<i>Cinclus pallasii</i>	Brown Dipper
41	Columbidae	<i>Columba hodgsonii</i>	Speckled Wood Dove
42	Columbidae	<i>Columba leuconota</i>	Snow Pigeon
43	Columbidae	<i>Columba rupestris</i>	Hill Pigeon
44	Columbidae	<i>Streptopelia orientalis</i>	Oriental Turtle Dove
45	Corvidae	<i>Corvus corax</i>	Common Raven
46	Corvidae	<i>Corvus macrorhynchos</i>	Large-billed Crow
47	Corvidae	<i>Dicrurus leucophaeus</i>	Ashy Drongo
48	Corvidae	<i>Nucifraga caryocatactes</i>	Spotted Nutcracker
49	Corvidae	<i>Pericrocotus ethologus</i>	Long-tailed Minivet
50	Corvidae	<i>Pericrocotus hypoxantha</i>	Yellow-bellied Fantail
51	Corvidae	<i>Pyrhacorax pyrrhacorax</i>	Red-billed Chough
52	Corvidae	<i>Pyrhacorax graculus</i>	Yellow-billed chough
53	Corvidae	<i>Urocissa flavirostris</i>	Yellow-billed Blue Magpie
54	Cuculidae	<i>Clamator jacobinus</i>	Pied Cuckoo
55	Cuculidae	<i>Cuculus canorus</i>	Eurasian Cuckoo
56	Cuculidae	<i>Cuculus poliocephus</i>	Lesser Cuckoo
57	Cuculidae	<i>Cuculus saturatus</i>	Oriental Cuckoo
58	Cuculidae	<i>Hierococcyx sparverioides</i>	Large Hawk Cuckoo
59	Falconidae	<i>Falco columbarius</i>	Merlin
60	Falconidae	<i>Falco peregrinus</i>	Perrgrine Falcon
61	Falconidae	<i>Falco tinnunculus</i>	Common Kestrel
62	Fringillidae	<i>Carduelis flavirostris</i>	Twite
63	Fringillidae	<i>Carduelis spinoiedes</i>	Yellow-breasted greenfinch
64	Fringillidae	<i>Carpodacus erythrinus</i>	Common rosefinch
65	Fringillidae	<i>Carpodacus nipalnesis</i>	Dark-brested rosefinch
66	Fringillidae	<i>Carpodacus pulcherrimus</i>	Beautiful rosefich
67	Fringillidae	<i>Carpodacus puniceus</i>	Red-fronted rosefinch
68	Fringillidae	<i>Carpodacus rodochrous</i>	Pink-browed rosefinch
69	Fringillidae	<i>Carpodacus rodopeplus</i>	Spot-winged rosefinch
70	Fringillidae	<i>Carpodacus rubicilla</i>	Great rosefinch
71	Fringillidae	<i>Carpodacus rubicilloides</i>	Streaked rosefinch
72	Fringillidae	<i>Carpodacus thura</i>	white-browed rosefinch
73	Fringillidae	<i>Emberiza fucata</i>	Chestnut-eared Bunting
74	Fringillidae	<i>Emberiza pusilla</i>	Little bunting
75	Fringillidae	<i>Leucostice brandti</i>	Brandt's mountain finch
76	Fringillidae	<i>Leucostice nemoricola</i>	Plain mountain finch

SN	Family	Scientific Name	Common Name
77	Fringillidae	<i>Loxia curvirostra</i>	Red crossbill
78	Fringillidae	<i>Mycerobas affinis</i>	Collared grosbeak
79	Fringillidae	<i>Nycerobas carripes</i>	White-winged grosbeak
80	Fringillidae	<i>Pinicola subhimachala</i>	Crimson-browed finch
81	Fringillidae	<i>Pyrrhula erythrocephala</i>	Red-headed bullfinch
82	Gruidae	<i>Grus virgo</i>	Demoisella Crane
83	Hirundinidae	<i>Delichon dasypus</i>	Asian house martin
84	Hirundinidae	<i>Delichon nepalensis</i>	Nepal house martin
85	Hirundinidae	<i>Hirundo rupestris</i>	Eurasian crag martin
86	Hirundinidae	<i>Hirundo rustica</i>	Barn swallow
87	Laniidae	<i>Lanius tephronotus</i>	Grey-backed Shrike
88	Laridae	<i>Larus brunnicephalus</i>	Brown-headed Gull
89	Laridae	<i>Larus ridibundus</i>	Black-headed Gull
90	Laridae	<i>Sterna hirundo</i>	Common Tern
91	Muscicapidae	<i>Chaimarrornis leucocephalus</i>	White-capped Water Redstart
92	Muscicapidae	<i>Copsychus saularis</i>	Oriental Magpie Robin
93	Muscicapidae	<i>Enicurus scouleri</i>	Little Forktail
94	Muscicapidae	<i>Eumyias thalassina</i>	Verditer Flycatcher
95	Muscicapidae	<i>Ficedula strophciata</i>	Rufous-gorgeted Flycatcher
96	Muscicapidae	<i>Ficedula superciliaris</i>	Ultramarine Flycatcher
97	Muscicapidae	<i>Ficedula tricolor</i>	Slaty-blue Flycatcher
98	Muscicapidae	<i>Grandala coelicolor</i>	Grandala
99	Muscicapidae	<i>Hodgsonius phaenicuroides</i>	White-bellied Redstart
100	Muscicapidae	<i>Luscinia brunnea</i>	Indian Blue Robin
101	Muscicapidae	<i>Luscinia pectoralis</i>	White-tailed Rubythroat
102	Muscicapidae	<i>Luscinia svecica</i>	Bluethroat
103	Muscicapidae	<i>Montocola rufivetris</i>	Chestnut-bellied Rock Thrush
104	Muscicapidae	<i>Muscicapa ferruginea</i>	Ferruginous Flycatcher
105	Muscicapidae	<i>Myophonus caeruleus</i>	Blue Whistling Thrush
106	Muscicapidae	<i>Niltava sundara</i>	Rufous-bellied Niltava
107	Muscicapidae	<i>Phoenicurus erythrogaster</i>	White-winged Redstart
108	Muscicapidae	<i>Phoenicurus frontalis</i>	Blue-fronted Redstart
109	Muscicapidae	<i>Phoenicurus hodgsoni</i>	Hodgson's Redstart
110	Muscicapidae	<i>Phoenicurus ochruros</i>	Black Redstart
111	Muscicapidae	<i>Phoenicurus schisticeps</i>	White-throated Redstart
112	Muscicapidae	<i>Rhyacornis fuliginosus</i>	Plumbelous Water Redstart
113	Muscicapidae	<i>Saxicola ferrea</i>	Grey Bushchat
114	Muscicapidae	<i>Saxicola torquatta</i>	Common Stonechat
115	Muscicapidae	<i>Tarsiger chryseus</i>	Golden Bush Robin

SN	Family	Scientific Name	Common Name
116	Muscicapidae	<i>Tarsiger cyanurus</i>	Orange-flanked Bush Robin
117	Muscicapidae	<i>Tarsiger indicus</i>	White-browed Bush Robin
118	Muscicapidae	<i>Turdus albocinctus</i>	White-collared Blackbird
119	Muscicapidae	<i>Turdus kessleri</i>	Kessler's Thrush
120	Muscicapidae	<i>Turdus merula</i>	Eurasian Blackbird
121	Muscicapidae	<i>Turdus ruficollis</i>	Dark-throated Thrush
122	Muscicapidae	<i>Turdus viscivorus</i>	Mistle Thrush
123	Muscicapidae	<i>Zoothera dixonii</i>	Long-tailed Thrush
124	Muscicapidae	<i>Zoothera mollosima</i>	Plain-backed Thrush
125	Nectariniidae	<i>Aethopyga gouldiae</i>	Mrs Gould's Sunbird
126	Nectariniidae	<i>Aethopyga ignicauda</i>	Fire-tailed sunbird
127	Paridae	<i>Parus ater</i>	Coal Tit
128	Paridae	<i>Parus dichrous</i>	Grey-crested Tit
129	Paridae	<i>Parus monticolus</i>	Green-backed Tit
130	Paridae	<i>Parus rubiventris</i>	Rufous-vented Tit
131	Passeridae	<i>Anthus godlewskii</i>	Blyth's pipit
132	Passeridae	<i>Anthus hodgsoni</i>	Olive-backed pipit
133	Passeridae	<i>Anthus roseatus</i>	Rosy pipit
134	Passeridae	<i>Montacilla citreola</i>	Citrine wagtail
135	Passeridae	<i>Montacilla alba</i>	White wagtail
136	Passeridae	<i>Montacilla cinerea</i>	Grey wagtail
137	Passeridae	<i>Montifringilla ruficollis</i>	Rufous-necked snowfinch
138	Passeridae	<i>Montifringilla adamsi</i>	Black-winged snowfinch
139	Passeridae	<i>Passer dimesticus</i>	House sparrow
140	Passeridae	<i>Passer montanus</i>	Eurasian tree sparrow
141	Passeridae	<i>Passer rutilans</i>	Russet sparrow
142	Passeridae	<i>Prunella collaris</i>	Alpine accentor
143	Passeridae	<i>Prunella fulvescens</i>	Brown accentor
144	Passeridae	<i>Prunella himalayana</i>	Altai accentor
145	Passeridae	<i>Prunella rubeculoides</i>	Robin accentor
146	Passeridae	<i>Prunella strophiatea</i>	Rufous-breasted accentor
147	Phasianidae	<i>Ithaginis cruentus</i>	Blood Pheasant
148	Phasianidae	<i>Lerwa lerwa</i>	Snow Partridge
149	Phasianidae	<i>Lophophorus impejanus</i>	Himalayan Monal
150	Phasianidae	<i>Lophura leucomelanos</i>	Kalij Pheasant
151	Phasianidae	<i>Tetraogallus tibetanus</i>	Tibetan Snowcock
152	Phasianidae	<i>Tragopan satyra</i>	Satyr Tragopan
153	Picidae	<i>Debdrocopos darjellensis</i>	Darjeeling woodpecker
154	Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe
155	Rallidae	<i>Fulica atra</i>	Common Coot

SN	Family	Scientific Name	Common Name
156	Regulidae	<i>Regulus regulus</i>	Goldcrest
157	Scolopacidae	<i>Actitis hypoleucos</i>	Common sandpiper
158	Scolopacidae	<i>Calidris temminckii</i>	Temminck's Stint
159	Scolopacidae	<i>Gallinago gallinago</i>	Common Snipe
160	Scolopacidae	<i>Gallinago nemoricola</i>	Wood Snipe
161	Scolopacidae	<i>Gallinago solitaria</i>	Solitary Snipe
162	Scolopacidae	<i>Scolopax rusticola</i>	Eurasian Woodcock
163	Scolopacidae	<i>Tringa nebularia</i>	common Greenshank
164	Scolopacidae	<i>Tringa ochropus</i>	Green Sandpiper
165	Scolopacidae	<i>Tringa totanus</i>	Common Redshank
166	Scolopacidae	<i>Xenus cinereus</i>	Terek Sandpiper
167	Sitiidae	<i>Tichodroma muraria</i>	Wallcreeper
168	Strigidea	<i>Anthene noctua</i>	Little owl
169	Strigidea	<i>Bubo bubo</i>	Eurasian Eagle Owl
170	Strigidea	<i>Strix aluco</i>	Tawny Owl
171	Sylviidae	<i>Alcippe vinipectus</i>	White-browed fulvetta
172	Sylviidae	<i>Cettia brunnifrons</i>	Grey-sided bush warbler
173	Sylviidae	<i>Garrulax affinis</i>	Black-faced Laughinthrush
174	Sylviidae	<i>Garrulax erythrocephalus</i>	Chestnut-crowned Laughingthrush
175	Sylviidae	<i>Garrulax lineatus</i>	streaked Laughinthrush
176	Sylviidae	<i>Garrulax ocellatus</i>	Spotted Laughinthrush
177	Sylviidae	<i>Heterophasia capsitrata</i>	Rufous sibia
178	Sylviidae	<i>Minla strigula</i>	Chestnut-tailed minla
179	Sylviidae	<i>Paradoxornis fulvifrons</i>	Fulvous parrotbill
180	Sylviidae	<i>Phylloscopus affinis</i>	Tickell's leaf warbler
181	Sylviidae	<i>Phylloscopus chlorontus</i>	Lemon-rumped warbler
182	Sylviidae	<i>Phylloscopus fulligiventer</i>	Smoky warbler
183	Sylviidae	<i>Phylloscopus inornatus</i>	Yellow-rumped warbler
184	Sylviidae	<i>Phylloscopus maculipennis</i>	Ashy-throated warbler
185	Sylviidae	<i>Phylloscopus magnirostris</i>	Large-billed leaf warbler
186	Sylviidae	<i>Phylloscopus pulcher</i>	Buff-barred warbler
187	Sylviidae	<i>Phylloscopus reguloides</i>	Blyth's leaf warbler
188	Sylviidae	<i>Phylloscopus trochiloides</i>	Greenish warbler
189	Sylviidae	<i>Pnoepyga albiventer</i>	Scaly-breasted wren babbler
190	Sylviidae	<i>Seicercus burkii</i>	Golden-spectacled warbler
191	Sylviidae	<i>Seicercus whistleri</i>	Whistler's warbler
192	Sylviidae	<i>Yuhina gularis</i>	Stripe-throated yuhina
193	Sylviidae	<i>Yuhina occipitalis</i>	Rufous-vented yuhina
194	Upupidae	<i>Upapa epops</i>	Coomon Hoopoe



Annex IV List of Herpetofauna Recorded in SNP and its BZ

SN	Family	Scientific Name	Common Name
Amphibians			
1	Bufonidae	<i>Bufo himalayanus</i>	Himalayan toad
2	Bufonidae	<i>Bufo melanostictus</i>	Black toad, common toad
3	Bufonidae	<i>Bufo stomaticus</i>	Marbled toad
4	Ranidae	<i>Euphlyctis cyanophlyctis</i>	Green toad
5	Ranidae	<i>Limnonectes sp.</i>	Cricket frog
6	Ranidae	<i>Paa liebigii</i>	Liebig's frog
7	Ranidae	<i>Paa polunini</i>	Langtang Frog
Reptiles			
8	Agamidae	<i>Calotes versicolor</i>	Common garden lizard
9	Agamidae	<i>Laudakia tuberculata</i>	Tuberculated agama
10	Colubridae	<i>Amphiesma parallela</i>	Boulenger's keelback
11	Colubridae	<i>Amphiesma platyceps</i>	Eastern keelback
12	Colubridae	<i>Elaphe hodgsonii</i>	Himalayan trinkt snake
13	Colubridae	<i>Oligodon erythrogaster</i>	Red-bellied kukri snake
14	Colubridae	<i>Pseudoxenodon macrops macrops</i>	Western large-eyed false cobra
15	Scincidae	<i>Scincella ladecense himalayanus</i>	Himalayan/Glacier skink
16	Viperidae	<i>Agkistrodon himalayanus</i>	Himalayan pit viper
17	Viperidae	<i>Ovophis monticola monticola</i>	Mountain pit viper
18	Viperidae	<i>Trimeresurus albolabris</i>	White-lipped tree viper

Annex V Existing Security Posts in SNP and its BZ

S. N.	Post	Post Type			Location	Remarks
		Park	Army	Combined		
1	Namche			√	National Park	National Park and Company HQ
2	Sangboche	√			National Park	
3	Furte	√			National Park	
4	Thame		√		National Park	
5	Tashinga	√			National Park	
6	Dole	√			National Park	
7	Debuche	√			National Park	
8	Monjo	√			Buffer Zone	National Park Entry Point
9	Lukla			√	Buffer Zone	

Annex VI

Existing organizational composition of the staff in SNP

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	2	
3	Section Officer	Gazetted Class Third	Administration	General Administration	1	
4	Account Officer	Gazetted Class Third	Administration	Account	1	
5	Ranger	Non-gazetted Class First (Tech)	Forest	National Parks and Wildlife	5	
6	Computer Operator	Non-gazetted Class First	Miscellaneous	Miscellaneous	1	
7	Accountant	Non-gazetted Class First	Administration	Account	1	
8	Kharidar	Non-gazetted Class Second	Administration	General Administration	3	
9	Senior Gamescout	Non-gazetted Class Second	Forest	National Parks and Wildlife	12	
10	Senior Gamescout	Non-gazetted Fourth Second	Forest	National Parks and Wildlife	1	
11	Gamescout	Non-classed	Forest	National Parks and Wildlife	39	
12	Office Helper	Non-classed	Administration	General Administration		
Total					68	





Annex VII

Tourist record of Sagarmatha National Park

SN	Fiscal Year	No. of visitors	Remarks
1	1975-76	3600	
2	1976-77	3550	
3	1977-78	3650	
4	1978-79	3850	
5	1986-87	8135	
6	1987-88	8405	
7	1988-89	7878	
8	1989-90	8196	
9	1990-91	8785	
10	1991-92	11318	
11	1992-93	12180	
12	1993-94	12549	
13	1994-95	13388	
14	1995-96	15529	
15	1996-97	17067	
16	1997-98	17890	
17	1998-99	21394	
18	1999-00	26483	
19	2000-01	25292	
20	2001-02	19678	
21	2002-03	19300	
22	2003-04	21396	
23	2004-05	19063	
24	2005-06	20036	
25	2006-07	25814	
26	2007-08	30599	
27	2008-09	28784	
28	2009-10	31126	
29	2010-11	33390	
30	2011-12	35531	
31	2012-13	36650	
32	2013-14	35171	
33	2014-15	34412	

Annex VIII

Buildings and other properties damaged due to the devastating Earthquake of April, 2015 in SNP

S. N.	Building name and location	No. of rooms	Damage type		Budget for construction / maintenance (Rs.)	Remarks
			Minor	Major		
1	Office Building, Namche-1	11		√	2,00,00,000	Park HQ
2	Staff Quarter, Namche-1	3		√	35,00,000	
3	Staff Quarter, Namche-1	3		√	35,00,000	
4	Assistant Warden Quarter, Namche-1	4	√		5,00,000	
5	Meeting Hall (Golghar), Namche-1	1	√		5,00,000	
6	Visitors' Center, Namche-1	5	√		10,00,000	
7	Kitchen Building, Namche-1	2			15,00,000	
8	Toilet outside the Office Building, Namche-1	2		√	5,00,000	
9	Toilet outside the Staff Quarter, Namche-1	1		√	3,00,000	
10	Debuche Post, Khumjung-6	4	√		10,00,000	
11	Tasinga Post, Khumjung-2	3		√	50,00,000	
12	Sangboche Post, Khumjung-1	3		√	50,00,000	
13	Furte Post, Namche-4	3		√	35,00,000	
14	Jorsalle Post, Chaurikharka-1	11	√		10,00,000	
15	Toktok security Post, Chaurikharka-5	3		√	40,00,000	
16	Toilet of Toktok Post, Chaurikharka-5	3		√	6,00,000	
Total					5,14,00,000	



Annex IX

Activities and budget of the Management Plan for the SNP and its BZ for five-year period 2016-2020

Budget in thousand Rupees

SN	Activities	Unit	Qty.	Rate	Total Amount	Year I		Year II		Year III		Year IV		Year V	
						Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1	Biodiversity conservation				386440		183310		173520		14270		7620		7720
1.1	Park zonation				1100		0		600		300		100		100
1.1.1	GIS-based mapping for Park zonation	Times	1	300	300	0	0	1	300	0	0	0	0	0	0
1.1.2	Stakeholders consultation and ground verification	Times	2	100	200	0	0	2	200	0	0	0	0	0	0
1.1.3	Orientation on Park zonation	Times	4	100	400	0	0	1	100	1	100	1	100	1	100
1.1.2	Publication of park zonation output	Times	1	200	200	0	0	0	0	1	200	0	0	0	0
1.2	Park and security posts				50500		20000		16500		8000		3000		3000
1.2.1	Construction of range posts	No.	2	5000	10000	1	5000	1	5000	0	0	0	0	0	0
1.2.2	Construction of park posts	No.	3	3500	10500	2	7000	1	3500	0	0	0	0	0	0
1.2.3	Construction of security posts	No.	3	5000	15000	1	5000	1	5000	1	5000	0	0	0	0
1.2.4	Maintenance of park posts	No.	10	500	5000	2	1000	2	1000	2	1000	2	1000	2	1000
1.2.5	Maintenance of security posts	No.	10	500	5000	2	1000	2	1000	2	1000	2	1000	2	1000
1.2.6	Facilities upgrade at posts	Times	10	500	5000	2	1000	2	1000	2	1000	2	1000	2	1000
1.3	Intelligence network				3200		700		600		600		700		600
1.3.1	Formation and orientation	Times	2	100	200	1	100	0	0	0	0	1	100	0	0
1.3.2	Mobilization of informant network	Person	5	600	3000	5	600	5	600	5	600	5	600	5	600
1.4	Park patrolling				5700		1540		1040		1040		1040		1040
1.4.1	Sweeping and camping operations	Times	30	50	1500	6	300	6	300	6	300	6	300	6	300
1.4.2	Initiate real time SMART patrolling	Times	1	500	500	1	500	0	0	0	0	0	0	0	0
1.4.3	Field equipment purchase	Times	5	500	2500	1	500	1	500	1	500	1	500	1	500
1.4.4	Operation of real time SMART patrolling	Months	60	20	1200	12	240	12	240	12	240	12	240	12	240
1.5	Species conservation				6500		1200		1700		1200		1200		1200
1.5.1	Snow leopard conservation	Times	5	500	2500	1	500	1	500	1	500	1	500	1	500
1.5.2	Musk deer conservation	Times	5	400	2000	1	400	1	400	1	400	1	400	1	400
1.5.3	Red panda conservation	Times	5	300	1500	1	300	1	300	1	300	1	300	1	300
1.5.4	Feasibility for blue sheep translocation	Times	1	500	500	0	0	1	500	0	0	0	0	0	0

SN	Activities	Unit	Qty.	Rate	Total Amount	Year I		Year II		Year III		Year IV		Year V	
						Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1.6	GLOF risk minimization				264740		132740		130500		500		500		500
1.6.1	Monitoring the changes at Imja lake	Months	12	20	240	12	240	0	0	0	0	0	0	0	0
1.6.1	Establish early warning system	No.	1	2000	2000	1	2000	0	0	0	0	0	0	0	0
1.6.2	Construction of controlled drainage at Imja lake	No.	1	260000	260000	0.5	130000	0.5	130000	0	0	0	0	0	0
1.6.3	Institutional support for disaster risk management committee	Times	5	500	2500	1	500	1	500	1	500	1	500	1	500
1.7	Rangeland management				950		0		150		500		150		150
1.7.1	Mapping of important rangelands	Times	1	500	500	0	0	0	0	1	500	0	0	0	0
1.7.2	Orientation on rotational grazing	Times	3	150	450	0	0	1	150	0	0	1	150	1	150
1.8	Wetland management				1800		300		900		300		0		300
1.8.1	Wetland inventory and status update	Times	1	500	500	0	0	1	500	0	0	0	0	0	0
1.8.2	RIS update	Times	1	400	400	0	0	1	400	0	0	0	0	0	0
1.8.3	Wetland conservation campaign	Times	3	300	900	1	300	0	0	1	300	0	0	1	300
1.9	Fire management				1750		330		530		330		230		330
1.9.1	Mapping of fire prone areas	Times	1	300	300	0	0	1	300	0	0	0	0	0	0
1.9.2	Firefighting training	Times	3	100	300	1	100	0	0	1	100	0	0	1	100
1.9.3	Mobilize staff and local people for fire fighting	Times	30	25	750	6	150	6	150	6	150	6	150	6	150
1.9.4	Media campaign for fire prevention	Times	10	40	400	2	80	2	80	2	80	2	80	2	80
1.10	Enhancing world heritage value				1700		100		1100		100		300		100
1.10.1	Installation of world heritage plaque	No.	1	500	500	0	0	1	500	0	0	0	0	0	0
1.10.1	Public awareness activities	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
1.10.1	Poster publication	Times	2	200	400	0	0	1	200	0	0	1	200	0	0
1.10.2	Status update and reporting	Times	1	300	300	0	0	1	300	0	0	0	0	0	0
1.11	Reconstruction after earthquake				46500		26000		19500		1000		0		0
1.11.1	Office building construction at park HQ	No.	1	20000	20000	0.5	10000	0.5	10000	0	0	0	0	0	0
1.11.2	Staff quarter construction	No.	3	4000	12000	2	8000	1	4000	0	0	0	0	0	0
1.11.3	Building maintenance	No.	10	500	5000	4	2000	4	2000	2	1000	0	0	0	0
1.11.4	Trekking trail maintenance	km	30	150	4500	20	3000	10	1500	0	0	0	0	0	0
1.11.5	Bridge and culvert maintenance	No.	5	1000	5000	3	3000	2	2000	0	0	0	0	0	0
1.12	Wildlife health management				2000		400		400		400		400		400

SN	Activities	Unit	Qty.	Rate	Total Amount	Year I		Year II		Year III		Year IV		Year V	
						Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
1.12.1	Health condition assessment of key wildlife	Times	5	200	1000	1	200	1	200	1	200	1	200	1	200
1.12.2	Disease surveillance	Times	5	200	1000	1	200	1	200	1	200	1	200	1	200
2	Tourism promotion and culture conservation				114350		12500		43750		39600		9750		8750
2.1	Trekking route management				11150		0		850		3000		4150		3150
2.1.1	Upgrade the existing trekking trail	km	30	150	4500	0	0	0	0	10	1500	10	1500	10	1500
2.1.2	Bridge and culvert maintenance	No.	15	300	4500	0	0	0	0	5	1500	5	1500	5	1500
2.2.3	Feasibility study to develop ropeway system from Surke to Namche	Times	1	1000	1000	0	0	0	0	0	0	1	1000	0	0
2.2.4	Feasibility for alternative trail	Times	1	700	700	0	0	1	700	0	0	0	0	0	0
2.1.5	Campaign to limit motor-able road at Surke	Times	3	150	450	0	0	1	150	0	0	1	150	1	150
2.2	Develop facilities for visitors				58400		300		28900		26400		1400		1400
2.2.1	Establish a counter of SNP at Lukla airport	No.	1	1000	1000	0	0	1	1000	0	0	0	0	0	0
2.2.2	Maintain and manage helipads	No.	4	600	2400	0	0	1	600	1	600	1	600	1	600
2.2.3	Construction of interpretation center	No.	1	50000	50000	0	0	0.5	25000	0.5	25000	0	0	0	0
2.2.4	Develop e-ticketing system for visitors	Times	1	1500	1500	0	0	1	1500	0	0	0	0	0	0
2.2.5	Operate e-ticketing system	Times	4	500	2000	0	0	1	500	1	500	1	500	1	500
2.2.6	Nature guide management (Training and registration)	Times	5	300	1500	1	300	1	300	1	300	1	300	1	300
2.3	Sanitation in Everest region				30000		11200		12200		2200		2200		2200
2.3.1	Awareness campaign on pollution control	Times	5	200	1000	1	200	1	200	1	200	1	200	1	200
2.3.2	Support SPCC for garbage management	Times	5	1000	5000	1	1000	1	1000	1	1000	1	1000	1	1000
2.3.3	Establish community based garbage management museum in SNP	Times	1	20000	20000	0.5	10000	0.5	10000	0	0	0	0	0	0
2.3.4	Operate museum	Years	4	1000	4000	0	0	1	1000	1	1000	1	1000	1	1000
2.4	Tourism diversification and management				3300		0		800		1500		500		500
2.4.1	Feasibility study for cycling route	Times	1	300	300	0	0	1	300	0	0	0	0	0	0
2.4.2	Feasibility study for skydiving and paragliding	Times	1	500	500	0	0	0	0	0	0	0	0	1	500

SN	Activities	Unit	Qty.	Rate	Total Amount	Year I		Year II		Year III		Year IV		Year V	
						Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
2.4.3	Develop rescue center and operate	Center	1	1500	1500	0	0	0	0	1	1500	0	0	0	0
2.4.4	Rock climbing site management in Phortse	Times	1	500	500	0	0	1	500	0	0	0	0	0	0
2.4.5	Feasibility study for bungy-jump, canoeing and ski in SNP	Times	1	500	500	0	0	0	0	0	0	1	500	0	0
2.5	Culture conservation				11500		1000		1000		6500		1500		1500
2.5.1	Support for maintenance of monasteries	No.	5	1000	5000	1	1000	1	1000	1	1000	1	1000	1	1000
2.5.2	Construction of Buddha statue in Namche	No.	1	5000	5000	0	0	0	0	1	5000	0	0	0	0
2.5.3	Support for cultural event	Times	3	500	1500	0	0	0	0	1	500	1	500	1	500
3	Buffer zone management				195000		35000		35000		40000		40000		45000
3.1	BZMC and BZUC program activities				195000		35000		35000		40000		40000		45000
3.1.1	Conservation program				58500		10500		10500		12000		12000		13500
3.1.2	Community development program				58500		10500		10500		12000		12000		13500
3.1.3	Income generation and skill development program				39000		7000		7000		8000		8000		9000
3.1.4	Conservation education program				19500		3500		3500		4000		4000		4500
3.1.5	Administrative cost				19500		3500		3500		4000		4000		4500
4	Institutional management				18740		2630		4125		4880		3525		3580
4.1	Monitoring, survey and research				9000		1100		2100		2100		1600		2100
4.1.1	Monitoring wildlife (Snow leopard, Musk deer, Red panda, Himalayan black bear and Himalayan tahr)	Times	5	500	2500	1	500	1	500	1	500	1	500	1	500
4.1.2	Status report publication	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
4.1.3	Migratory and other bird survey in SNP	Times	2	500	1000	1	500	0	0	1	500	0	0	0	0
4.1.4	Monitoring the impact of climate change in tree species in SNP	Years	4	1000	4000	0	0	1	1000	1	1000	1	1000	1	1000
4.1.5	Tourism impact monitoring in SNP	Times	2	500	1000	0	0	1	500	0	0	0	0	1	500
4.2	Capacity building				2000		200		600		550		400		250
4.2.1	Annual sharing and team building workshop	No.	5	100	500	1	100	1	100	1	100	1	100	1	100

SN	Activities	Unit	Qty.	Rate	Total Amount	Year I		Year II		Year III		Year IV		Year V	
						Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount	Qty.	Amount
4.2.2	Orientation on anti-poaching and legal issues	No.	2	150	300	0	0	1	150	0	0	1	150	0	0
4.2.3	Wildlife handling training	No.	2	150	300	0	0	0	0	1	150	0	0	1	150
4.2.4	Orientation to protection unit on conservation	No.	2	100	200	1	100	0	0	1	100	0	0	0	0
4.2.5	Field techniques and equipment training	No.	1	200	200	0	0	0	0	1	200	0	0	0	0
4.2.6	Wildlife health assessment training	No.	1	200	200	0	0	1	200	0	0	0	0	0	0
4.2.7	Training on SMART patrolling	No.	2	150	300	0	0	1	150	0	0	1	150	0	0
4.3	Coordination and collaboration				2400		300		500		800		500		300
4.3.1	District level coordination meeting	No.	5	100	500	1	100	1	100	1	100	1	100	1	100
4.3.2	Tourism coordination committee meeting	No.	10	100	1000	2	200	2	200	2	200	2	200	2	200
4.3.3	Landscape level meeting- MBNP & GCA	No.	2	200	400	0	0	1	200	0	0	1	200	0	0
4.3.4	Trans-boundary meeting with QNR	No.	1	500	500	0	0	0	0	1	500	0	0	0	0
4.4	Special day celebration				1750		350		350		350		350		350
4.4.1	Park establishment day	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
4.4.2	Wetland day	Times	5	50	250	1	50	1	50	1	50	1	50	1	50
4.4.3	Biodiversity day	Times	5	50	250	1	50	1	50	1	50	1	50	1	50
4.4.4	Wildlife week	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
4.4.5	Environment day	Times	5	50	250	1	50	1	50	1	50	1	50	1	50
4.5	Extension for biodiversity conservation				1840		330		225		730		325		230
4.5.1	Annual progress report publication	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
4.5.2	Calendar publication	Times	2	100	200	1	100	0	0	0	0	1	100	0	0
4.5.3	Printing on cup regarding WHS	Times	3	30	90	1	30	0	0	1	30	0	0	1	30
4.5.4	Printing on Cap regarding SNP	Times	2	25	50	0	0	1	25	0	0	1	25	0	0
4.5.5	Documentary on SNP and its management	Times	1	500	500	0	0	0	0	1	500	0	0	0	0
4.5.6	Radio program	Times	5	100	500	1	100	1	100	1	100	1	100	1	100
4.6	Monitoring and evaluation				1750		350		350		350		350		350
4.6.1	Monitoring the progress by internal team	Times	15	50	750	3	150	3	150	3	150	3	150	3	150
4.6.2	Evaluation by DNPWC and ERFD	Times	10	100	1000	2	200	2	200	2	200	2	200	2	200
Total					714530		233440		256395		98750		60895		65050

Annex X

List of the activities proposed during the consultative meetings of the BZUCs

a. Namche Buffer Zone User Committee

7. Identification of cycling trail and initiate cycling in buffer zone as a tourism activity;
2. Managing skydiving and paragliding in buffer zone;
3. Introducing adventurous activities such as bungee jumping, jeep lining, canoeing, skiing, kayaking etc;
4. Establishment and operation of ropeway from Surke to Namche for goods and materials transportation;
5. Establishment and operation of cable car for tourists from Namche to Kongde;
6. Construction of rock climbing and ice climbing training site in buffer zone;
7. Establishment of Tea shop in Topdanda by Buffer Zone User Committee;
8. Upgrading museum at Sagarmatha National Park, Namche;
9. Establishment of rescue center in Namche;
10. Establishment of local mini-grid integrating all micro-hydro projects in Namche, Khumjung and Chaurikharka VDCs;
11. Construction of micro-hydro project in Thesyo khola and Mulpani of Namche;
12. Electrification of every settlements within Namche VDC;
13. Construction and operation of aged care facility in Thesyo village;
14. Construction of drinking water facility in every settlements of Namche VDC;
15. Maintenance and reconstruction of trekking trails;
16. Nursery operation and seedling production in Phurte and plantation in suitable sites;
17. Protection of plantation area through boundary wall and fencing construction;
18. Construction of play ground in Thamichowa area;
19. Construction of picnic spot in Thesyo area;
20. Extension of telephone line in every settlements of Namche VDC;
21. Construction of necessary towers in Namche for strengthened communication facility;
22. Training on agriculture, livestock management and other skill development;
23. Construction of trekking route from Thame to Rolwaling through Tashilapcha pass;
24. Construction of Potter shelter in Nangpala;
25. Construction of Buddha Statue in suitable site in Namche;
26. Construction and operation of tourist lodge with 40 bed capacity in Namche;
27. Construction of green house for promoting agriculture;
28. Construction of staff quarter in Namche and
29. Alternative energy promotion in Namche.

b. Khumbi Yulha Buffer Zone User Committee

7. Maintenance and reconstruction of trekking trails;
2. Soil conservation activities in Khumjung, Ward No. 2 to 7;
3. Nursery operation, seedling production and plantation;
4. Construction of drinking water supply facility in Khumjung, Ward No. 1 to 5;
5. Construction of waste water and sewage management canal in Khumjung, ward No. 1 to 5;
6. Construction of Helipads in every major settlements of Khumjung VDC;
7. Electrification in every settlements in Khumjung VDC;
8. Develop master plan of Khumjung vDC
9. Placement of notice boards in public places;
10. Identification of cycling trail and initiate cycling in Khumjung;
11. Construction of public toilet;
12. Provide support to Khumbu Bijuli Company (KBC) for expanding electricity facility in Khumjung;
13. Construction of community buiding for Khumjung Youth Club;
14. Extension of telephone line in every settlements of Khumjung VDC;

15. Construction of towers as per need for the effective communication facility in Khumjung VDC;
16. Construction of micro-hydro in Gokyo, Thaknak, Dole, Pheriche, Dingboche and Pangboche;
17. Construction of mini-grid in Namche, Khumjung and Chaurikharka VDC and integrating every micro-hydro in this mini-grid;
18. Establishment of Khumbu climbing center;
19. Construction of Phortse-Thaknak bridge;
20. Construction of Chukung bridge;
21. Construction of waste water and sewage management canal in Khumjung-7, Dingboche;
22. Upgrade micro-hydro in Phortse;
23. Maintenance and reconstruction of monasteries in Khumjung;
24. Construction of community building in Khunde and Pangboche;
25. Construction of boundary wall and fencing in plantation area;
26. Construction of training site for rock climbing and ice climbing;
27. Conservation of Sherpa culture;
28. Establishment and operation of drinking water company in private land;
29. Establishment and operation of furniture industry in appropriate private land;
30. Continuation of three hotels operated by Sagarmatha National Park;
31. Construction of green house for promoting agriculture;
32. Soil erosion control in Khumjung-2, Dole;
33. Construction of play ground in Khunde;
34. Construction and operation of rescue center in Khumjung;
35. Construction of trekking trail in Tauche View Point;
36. Construction of indoor swimming pool in Khumjung;
37. Construction of staff quarter in Khumjung;
38. Alternative energy promotion and
39. Identification and promotion of adventurous tourism activities in Khumjung.

c. Chaurikharka Buffer Zone User Committee

7. Construction of drinking water facility in Chaurikharka- 2;
2. Stone paving around Chhorten in Chaurikharka-2;
3. Maintenance of trekking trail in Chaurikharka-2;
4. Establishment of revolving fund for income generation activities;
5. Construction of improved water turbine in Chaurikharka-2, 4, 7 and 9;
6. Management of Maane in Chaurikharka-2, 3, 5 and 9;
7. Support to Buffer Zone User Groups for office management;
8. Support for community forest management;
9. Support for biogas plant construction in Chaurikharka- 3 and 6;
10. Maintenance of community building in Chaurikharka- 1, 5 and 6;
11. Construction of community building in Chaurikharka- 4, 5 and 6;
12. Nature trail management in Chaurikhraka- 1, 5 and 6;
13. Construction of Teachers' quarter in Chaurikharka- 1 and 6;
14. Maintenance and reconstruction of trekking trail;
15. Construction of swimming pool and nature garden;
16. Soil erosion control activities in Chaurikharka- 1 to 9;
17. Construction of community building in Chaurikharaka- 4, 5 and 6;
18. Construction of drinking water facility in Chaurikharka- 3, 4, 6, 7 and 9;
19. Strengthening capacity for fire prevention and control;
20. Exploring and marketing of new tourism sites in Chaurikharka VDC;
21. Construction of view tower and other infrastructure for eco-tourism promotion in Chaurikharka;
22. Construction of skiing and climbing center in Lungding ;

23. Training on Amchi- Traditional Tibetan Health Care;
24. Establishment of depot for kerosene and Liquid Petroleum Gas (LPG);
25. Conservation awareness through mass media;
26. Construction of infrastructure for ice training in Thadokoshi;
27. Conservation and management of Raniban;
28. Nursery operation, seedling production and plantation;
29. Construction of iron bridge in Chaurikharka- 4, , 7 and 8;
30. Construction of drinking water facility in Chaurikharka- 1 and 4;
31. Construction of waste water and sewage canal in Chaurikharka- 1 and 8;
32. Construction of public toilets;
33. Construction of tourist park;
34. Construction of rock climbing site;
35. Construction of badminton hall;
36. Construction of park in Jopake;
37. Management of Triveni temple;
38. Management of museum;
39. Identification of cycling trail and initiate cycling in Chaurikharka;
40. Stone paving in trekking trail;
41. Conservation of Nagthan in Chaurikharka- 5;
42. Construction of micro-hydro in Chaurikharka- 1, 4, 5 and 9;
43. Identification and conservation of Red Panda zone;
44. Training on home stay tourism management;
45. Training on house wiring and plumbing;
46. Support for health posts management;
47. Support for police post construction;
48. Construction of RCC bridge in Chaurikharka-7;
49. Construction of suspension bridge in Chauikharka- 4 and 7;
50. Support for school building construction in Chaurikharka-9;
51. Construction of trekking trail in Abrek Dudhkunda;
52. Construction of hydropower in Lumding khola;
53. Construction of evacuation center in Muse;
54. Construction of Pashang Lhamu gate in Lukla;
55. Exposure visits to other protected areas of the country and abroad;
56. School program for Sherpa language teaching;
57. Initiate adventurous activities such as bungee jump and jeep lining;
58. Initiate rafting and canoeing from Larcha Dovan to Ghat;
59. Construction and operation of cable car in Dudhkunda and Kongde;
60. Construction and operation of rope way from Surke to Namche for goods and materials transportation;
61. Construction of fire control room;
62. Support for biogas promotion and LPG and kerosene depot;
63. Promotion of steel and iron furniture as a substitute to wood in the area;
64. Promote organic vegetable farming and support for marketing it;
65. Training on livestock husbandry;
66. Training on food processing;
67. Support for green house construction;
68. Support for Pashang Lhamu Museum construction;
69. Construction and management of Tenzing-Hillary park;
70. Construction of grain storage center;
71. Establishment of Non-timber Forest Products processing center and
72. Establishment of multi-purpose nursery.



Annex XI Management Plan Review Team

SN	Name	Designation	Organization	Remarks
1	Mr. Krishna Prasad Acharya	Chief Planning Officer	Ministry of Forests and Soil Conservation	
2	Mr. Fanindra Raj Kharel	Director General	Department of National Parks and Wildlife Conservation	
3	Mr. Gopal Prakash Bhattarai	Deputy Director General	Department of National Parks and Wildlife Conservation	
4	Dr. Maheshwar Dhakal	Deputy Director General	Department of National Parks and Wildlife Conservation	
5	Mr. Shyam Sundar Bajimaya	Former Director General	Department of National Parks and Wildlife Conservation	
6	Mr. Buddi Sagar Poudel	Research Officer	Department of Forest Research and Survey	







Government of Nepal

Ministry of Forests and Soil Conservation

Department of National Parks and Wildlife Conservation

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