MANAGEMENT PLAN

Fiscal Year 074/075-078/079 (2017/018-2021/022)

SHIVAPURI NAGARJUN NATIONAL PARK AND BUFFER ZONE

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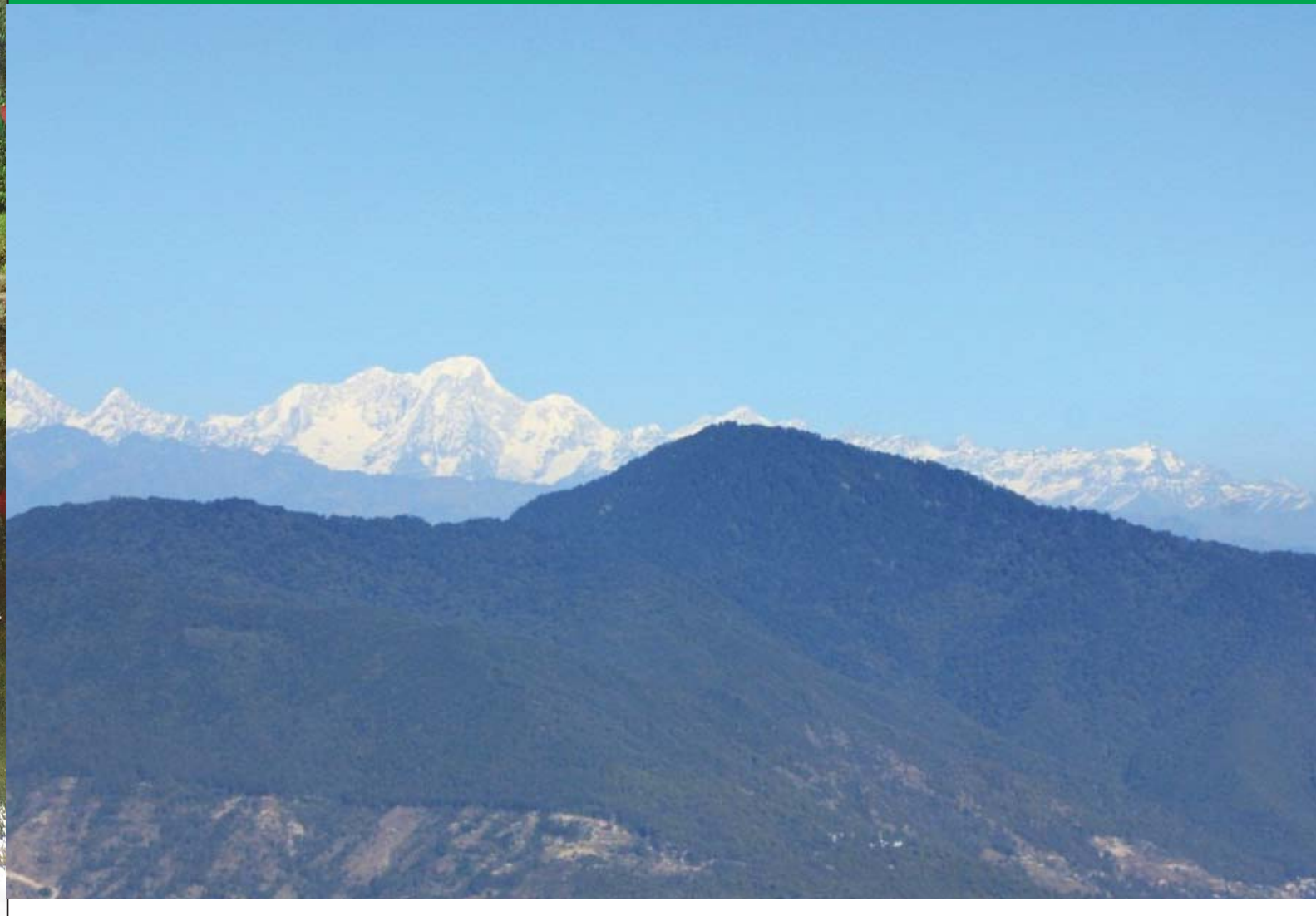

Government of Nepal

Ministry of Forests and Environment

Department of National Parks and Wildlife Conservation

Shivapuri Nagarjun National Park Office

Panimuhan, Kathmandu

IBA

BIRDLIFE IMPORTANT BIRD AND BIODIVERSITY AREA

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Foreword

Established in 1976, Shivapuri Watershed Conservation Area is the first Watershed Conservation Area of the country. In 1978 it was renamed Shivapuri Watershed Protected Area and then Shivapuri Watershed and Wildlife Reserve in 1983. Established in 2002, Shivapuri National Park and later in 2009 Nagarjun Forest was added and renamed as Shivapuri Nagarjun National Park (SNNP) in 2009. The Park is mainly managed for watershed management of Holy Rivers such as Bagmati and Bishnumati, which are the sources of drinking water for 50 population of Kathmandu, capital city of Nepal and carbon sequestration of the metropolitan city. The Buffer Zone (BZ) of the park was gazetted in 2016 with the objective of gaining people's participation in managing park resources for biodiversity conservation and improving livelihood opportunities of the buffer zone communities.

A comprehensive management plan for Shivapuri Nagarjun National Park and Buffer Zone is very important in addressing the emerging issues and challenges and for translating the legislative provision into actions. This management plan (Fiscal Year 074/075-078/078) is prepared for both NP and BZ. This plan has opened up an avenue and paved the way forward for conserving core values of biodiversity, watershed management promoting sustainable and wise use principle of natural resources, including wetlands, regulating tourism and fulfilling the development aspirations of local communities in the buffer zone. With the endorsement of this plan, I am confident that there will be better management of the park and its buffer zone.

The Management Plan of SNNP and Buffer Zone is an outcome of the hard work of SNNP Management Plan Preparation Team and also an example of technical cooperation of experts and other organizations. I would take the opportunity to acknowledge the different stakeholders, including buffer zone communities. Besides, a large number of professionals, practitioners, academicians and other stakeholders have made valuable contributions during its preparation. The Plan formulation process has adopted a participatory approach and followed the prevailing format of the protected areas management plan preparation working procedure, 2073 B.S. endorsed by the DNPWC.

I am sure that this plan will be an important milestone for management of Shivapuri Nagarjun National Park and its Buffer Zone. Finally, I would like to thank all the individuals, organizations and stakeholders who extended their support and cooperation to bring this document to this final stage. At this juncture, I would like to request all the concerned stakeholders in joining hands in translating the vision of this plan into meaningful action.

Man Bahadur Khadka
Director General

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ACKNOWLEDGEMENTS

In the past, draft management plans of the national park were prepared in 1994, 2004 and 2016 but none of them were approved. Although after 23 years, the preparation of the management plan for Shivapuri Nagarjun National Park (SNNP) and Buffer Zone is completed, I strongly believe that this plan will be morally incomplete unless I acknowledge its contributors. The management plan is the outcome of continued support and cooperation of many individuals, organizations and stakeholders who were directly or indirectly involved in management planning and preparation process.

Sincere gratitude goes to Department of National Parks and Wildlife Conservation (DNPWC) for providing funds and Protected Area Management Plan Preparation Working Procedure, 2073 to prepare this plan, and to Center for Green Economy Development Nepal, Baluwatar, Kathmandu and Integrated Development Society Nepal for the partial funding for management plan preparation.

Sincere gratitude goes to the reviewers who provided their valuable time and expertise to improve the quality and content of the management plan. Reviewers: Shyam Sundar Bajimaya, Former Director General, DNPWC, Kathmandu, and Dr. Prof. Madav Bahadur Karki, Former Dean, Institute of Forestry, Pokhara Campus deserve special thanks for providing adorable comments, valuable suggestions and constructive criticisms to bring the plan to this stage.

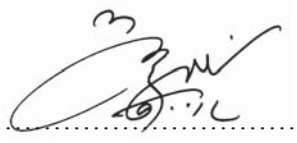
Sincere gratitude goes to the experts and reviewers who provided their valuable time and expertise to improve the quality and content of the management plan. Expert members Dr. Mohan Prasad Wagley, Mr. Shyam Sundar Bajimaya, Prof. Karan Bahadur Shah, Prof. Dr. Bhaiya Khanal, Dr. Bhuvan Kesher Sharma, Dr. Sailendra Pokhrel, Mr. Bhola Dhakal, Mr. Bhogendra Rayamajhii and Mr. Ramchandra Sedai deserve special thanks for providing adorable reports, comments, valuable suggestions and constructive criticisms to bring the plan to the final stage. I would like to thank Lumbini Environmental Services Pvt. Ltd., Kathmandu, for the Initial Environmental Examination work.

Lieutenant Colonel Mr. Biju Gurung of Barda Bahadur Battalion and Lieutenant Colonel Mr. Manoj Thapa of Naya Srinath Battalion are highly acknowledged for their important suggestions in park protection and management issues and its associated mitigation measures.

I would like to acknowledge buffer zone communities who actively participated in the preparation of five years programme details for buffer zone management. I owe special gratitude to Mr. Dhawa Lama, Chairperson of Buffer Zone Management Committee, who played a catalytic role in coordinating and making other necessary arrangements to ensure people's participation in management planning process.I extend my sincere thanks to Chairman of different Buffer Zone User Committees, primarily Mr. Narayan Tamang, Mr. Shyam Kumar Waiba, Mr. Rabi Shrestha, Mr. Narayan Shrestha, Mr. Salikram Chaulagai, Mr. Panchalal Dangol, Mr. Sujan Gurung, Mr. Kumar Tamang, Mr. Nirajan Tamang, and Mr. Jeevan Tamang for their valuable suggestions and significant support. In addition, CFUGs, BZUGs and tourism entrepreneurs also deserves gratitude for supporting in our core endeavor.

At this juncture, I would like to appreciate the work of the Management Plan Preparation Team Members whose continuous hardwork, perseverance and patience have brought the document to this shape. Mr. Amir Maharjan, Planning Officer and Mr. Narayan Rupakheti, Management Officer, Mr. Bishnu Prasad Thapaliya and Santosh Bhagat Assistant Management Officers of DNPWC, Mr. Arjun Bhusal, Mr. Raju Ghimire, Mr. Saroj Mani Poudel, Mr. Aravinda Yadav, Assistant Conservation Officer, Mr. Dil Bahadur Karki, Section Officer, Rangers Mr. Laba Guragain, Mr. Dilli Rai, Mrs. Sumjung Lama, Mr. Anish K.C., Mr. Keshab Dhodari, Mrs. Durga Chaudhary, Mrs. Puspa Mishra, Mr. Yogin Shrestha, Computer Operator and all office staff and buffer zone user committee office assistants, social mobilizers of BZ deserve special appreciation for handling and continuing the plan preparation work at different stages right from its beginning to finalization. At this moment, I would like to express my sincere gratitude to all for their photographs.

Finally, I would like to acknowledge all the people and stakeholders who contributed in the preparation of this plan and hope to receive similar support and cooperation in implementation of the plan as well.



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Kamal Jung Kunwar
Chief Conservation Officer

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

फोन नं. : ४२२०८५०
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४२२७९२६
फ्याक्स नं. ४२२७६७५

संकेत नं. :-
पत्र संख्या :- ०७४।७५ व्य.नं. 226
चलानी नं. :- ९३६८

पो. ब. नं. - ८६०
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मिति :- २०७४।९।१३

विषय :- शिवपुरी नागार्जुन राष्ट्रिय निकुञ्ज र त्यसको मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृत गरिएको सम्बन्धमा ।

श्री शिवपुरी नागार्जुन राष्ट्रिय निकुञ्ज कार्यालय
बुढानिलकण्ठ, पानीमुहान, काठमाण्डौं

प्रस्तुत विषयमा शिवपुरी नागार्जुन राष्ट्रिय निकुञ्ज र त्यसको मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृतिको लागि त्यस कार्यालयको पत्र संख्या २०७४।७५ मिति २०७४।६।३० को टिप्पणी सहित पेश हुन आएको ।

उल्लिखित फाईल उपर कारवाही हुँदा **"स्वीकृत व्यवस्थापन योजनालाई नेपाली भाषामा अनुवाद गरी अंग्रेजी र नेपाली दुवै भाषाको योजनालाई छापेर सरोकारवालालाई वितरण गर्ने"** गरी शिवपुरी नागार्जुन राष्ट्रिय निकुञ्ज र त्यसको मध्यवर्ती क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) मिति २०७४।९।१३ को विभागीय निर्णयानुसार स्वीकृत गरिएको हुँदा स्वीकृत व्यवस्थापन योजना र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन यसैसाथ राखी कार्यान्वयनको लागि पठाईएको व्यहोरा निर्णयानुसार अनुरोध छ ।

२०७४।९।१३

(विष्णु प्रसाद थपलिया)
सहायक व्यवस्थापन अधिकृत

EXECUTIVE SUMMARY

To protect watershed of Holy rivers Bagmati and Bishnumati from heavy deforestation and encroachment initially the Shivapuri Mountain Range was declared as Shivapuri Watershed Conservation Area in 1976. In 1978, it was declared Shivapuri Protected Watershed Area and in 1983 Shivapuri Watershed and Wildlife Reserve. The Shivapuri National Park with an area of 144 km^2 was initially gazetted in 2002. It was renamed as Shivapuri Nagarjun National Park (SNNP) after the addition of Nagarjun forest patch (15 km^2) in 2009 to form the park area of total 159km^2. To achieve the active people's participation in watershed and biodiversity conservation, Buffer Zone (BZ) was declared in 2016, covers an area of 118.61 km^2. around the national park.

The salient features of SNNP include **a**) a major source of fresh water for BZ communities, Kathmandu valley, fulfilling about 50% surface water demand, underground water recharge, irrigation and hydroelectricity, **b**) a sink for air pollution generated by Kathmandu valley, **c**) an important watershed of Holy rivers Bagmati and Bishnumati, **d**) a region of rich biodiversity of the mid–hill region, **e**) an important biological corridor that links north-south, **f**) an important bird area (IBA), **g**) one of the major tourist destination nearby capital city, **h**) a potential area for research and exploration, **i**) a site for conservation education for students and researchers.

The SNNP comprises four types of forests, which supports rich floral and faunal diversity. The SNNP is estimated to possess 1402 species of plants, of which 1114 species of flowering plants, 282 species of nonflowering plants gymnosperm, pteridophytes, and fungi. SNNP is home to one third species of orchids of Nepal (123 species). Similarly, 131 species of pteridophytes, 129 species of mushrooms, have been documented from SNNP. It comprises 124 species of butterflies, 122 species of insectes, 320 species of birds, and 30 species of mammals, including nine threatened species, such as Pangolin, Leopard cat, Clouded leopard, Common leopard, Goral, Himalayan black bear, Assamese monkey.

The BZ covers 118.61 km^2, encompassing parts of different wards of nine municipality and two rural municipality of four districts, is predominantly inhabited by Tamang, Brahmin, Chhetri and other ethnic groups. According to the SNNP survey 2016, the BZ comprises 27797 female and 28677 males to make a total population of 56,474.

The visitor records of SNNP show that the park has been visited by an average of 1,67,500 visitors annually during the last five years. During the fiscal year 2073/74 (July 2016 to June 2017) 16539 foreigners and 193178 Nepali visitors visited the park area. Major attractions of tourism in Shivapuri area are Bagdwar, Bishnudwar, Nagigumba, Shivapuri peak and Sundarijal, and that of Nagarjun area are Ichangu Narayan, Nagarjun and Jamacho.

The management plan emphasis on achieving short term goals and to cover contemporary issues on conservation with the vision of well conserved biodiversity, watersheds in the park and buffer zone for the wellbeing of local and national communities. Similarly, the overall goal of management plan of SNNP is to conserve and maintain biodiversity and natural ecosystems, improve watershed and wetlands, and enhance socio-economic and cultural values of SNNP and BZ.

The management objectives are:

To protect and conserve biodiversity, watershed, wetlands and conserve natural and cultural heritage through capacity building, research, community participation and community development to achieve sustainable development of SNNP and BZ. Specific objectives are:

I. To protect, conserve and document biodiversity with special focus on nationally protected, globally threatened and locally valuable, endangered and endemic species, critical ecosystems, and diverse wildlife habitats.

II. To manage the representative terrestrial and aquatic wildlife habitats and assess periodically habitat to maintain ecological functions and processes of mid-mountain ecosystem.

III. To manage watershed of Holy Rivers such as Bagmati and Bishnumati to improve water quality, hydrological functions and processes in perpetuity.

IV. To regulate and promote sustainable eco-tourism retaining wilderness within the least acceptable change on natural environment and socio-cultural heritage of SNNP and buffer zone.

V. To enhance public participation in biodiversity conservation by raising awareness, and improving livelihoods and minimizing human-wildlife conflicts by initiating effective measures in collaboration with local communities and local level government agencies

VI. To strengthen institutional capacity of park, security and buffer zone through research and capacity building in collaboration with relevant agencies and organizations.

The management goals and objectives of SNNP and BZ are grouped into six components, viz. Park management, watershed and wetland management, BZ management, tourism management, research and monitoring and institutional development.

Park Management

The objective of the park management is to conserve ecosystem and species diversity, and genetic resources. Three outputs have been proposed to address the objective as i) to conserve unique watershed ecosystems of Shivapuri Nagarjun, ii) to ensure viable populations of protected and endangered species, and iii) to improve wildlife habitats. In order to address these outputs various activities have been proposed.

Buffer zone management

The objective of Buffer Zone management is to achieve active people's participation in biodiversity conservation. There are twin objectives of BZ are conservation and development of forests in the buffer zone to fulfill the basic needs of daily forest products of BZ communities and upliftment of socio-economic condition of BZ communities through 30-50% park revenue plough back, with eight outputs. The outputs are: i) to ensure sustainable management of natural resources, ii) to enhance socio-economic opportunities, iii) to increase people's engagement in biodiversity conservation, iv) to manage biological corridors and connectivity, and v) to reduce human wildlife conflict vi) to promote ecotourism in the buffer zone, vii) to provide income generation and employment opportunities in the BZ and viii) to create conservation awareness among the local communities. Various activities have been proposed to address the objectives.

Tourism Management

The objective of tourism management is to enhance eco-friendly tourism in SNNP and BZ, with three outputs. The outputs are: i) to preserve cultural heritages, ii) to diversify tourism products, and iii) to increase employment and income generation opportunities. Various activities have been proposed to address the objectives.

Institutional Development

The objective of the institutional development is to enhance management capacity of the park, security personnel and BZ institutions, with four outputs. The outputs are: i) to strengthen management capacity of the park and security personnel, ii) to strengthen BZ institutions, iii) to enhance research and database, and iv) to strengthen monitoring and evaluation system. Various activities have been proposed to address the objectives.

Administrative Framework

The current strength of the SNNP management is 116 field staff led by the Chief Conservation Officer (Gazetted Second Class Officer). There two battalions of Nepal Army for the protection of national park resources. The organization structure in BZ is 310 BZUGs, 11 BZUCs, one BZMC, 2170 local conservation leaders, 54 BZCFUG's, 11 office assistant and six social mobilizers in all BZUC. DNPWC and SNNP will be the main authority for the implementation of the management plan. A total budget of NRs.84,93,50 (in thousands) has been proposed for five years, including Rs.57,43,50 (in thousands) for Park management, Rs.27,50,00 (in thousands) for Buffer Zone management. The local governments (DCCs and the *Gaupalika, Nagarpalika*), the Ministries and their field offices are expected to augment in their respective sectors such as agriculture, forests, livestock, plant resources, public health, soil and watershed conservation, tourism, and women development. The I/NGOs are expected to contribute in their specific fields of interests in biodiversity conservation and sustainable development.

Executive Summary:

Nepali

वि.सं. २००७ देखि २०३२ सालसम्म २५ वर्षको अवधिमा अत्यधिक वन विनाश र अतिक्रमणका कारण पवित्र वाग्मती र विष्णुमती नदीको जलाधार क्षेत्रको विनाश भएकोले यी नदीहरुको जलाधार क्षेत्र संरक्षण गर्न नेपाल सरकारले २०३२ सालमा शिवपुरी जलाधार संरक्षण क्षेत्रको रुपमा घोषणा गरी संरक्षणको शुरुवात गरेको थियो । त्यसको दुई वर्ष पश्चात २०३४ सालमा यसलाई शिवपुरी संरक्षित जलाधार क्षेत्र र वि.सं. २०३९ (सन् १९८३) मा शिवपुरी जलाधार क्षेत्र तथा वन्यजन्तु आरक्षको रुपमा संरक्षण गर्न थालियो । काठमाडौँ, नुवाकोट र सिन्धुपाल्चोक जिल्लाको समुन्द्र सतहदेखि १००० मिटरदेखि २७३२ मिटर उचाईसम्म फैलिएको मध्य पहाडी भूभागको उपोष्णदेखि समशितोष्ण क्षेत्रको १४४ वर्ग किमी क्षेत्रफल रहेको क्षेत्रलाई २०५८ साल (सन् २००२) मा शिवपुरी राष्ट्रिय निकुञ्जको रुपमा घोषणा गरियो । २०६५ (सन् २००९) सालमा १५ वर्ग किमी क्षेत्रफल भएको काठमाडौं र धादिङ जिल्लामा अवस्थित नागार्जुन वन क्षेत्रलाई पनि शिवपुरीमा समावेश गरी शिवपुरी नागार्जुन राष्ट्रिय निकुञ्जको रुपमा घोषणा गरियो । यो राष्ट्रिय निकुञ्ज काठमाडौँ उपत्यकाको उत्तर र पश्चिममा फैलिएको छ र यसले नेपालको संरक्षित क्षेत्र प्रणालीमा मध्य पहाडी भूभागको पारिस्थिकीय प्रणालीको प्रतिनिधित्व गरेको छ । निकुञ्ज र मध्यवर्ती क्षेत्रको जैविक विविधताको संरक्षण र व्यवस्थापनमा स्थानीय बासिन्दाको सक्रिय सहभागिता हासिल गर्न वि.सं. २०७२ (सन् २०१६) मा काठमाडौँ, नुवाकोट, सिन्धुपाल्चोक र धादिङ जिल्लाका ९ नगरपालिका र २ गाउँपालिकाको ११८.६१ वर्ग किमी क्षेत्रफल समेटेर मध्यवर्ती क्षेत्र घोषणा गरिएको छ ।

यो राष्ट्रिय निकुञ्जका मुख्य विशेषताहरु मध्ये क) मध्यवर्तीका सम्पूर्ण र काठमाडौँ उपत्यकाका ५० प्रतिशतभन्दा बढी बासिन्दाका लागि शुद्ध खानेपानी आपूर्ति गर्नु, भूमिगत जलभण्डार, सिंचाई र जलविद्युत उत्पादनका लागि जल प्रवाह गर्नु ख) काठमाडौँ उपत्यकामा उत्सर्जन हुने प्रदुषित वायूलाई कार्वन विच्छेदनका माध्यमबाट काठमाडौँको हावालाई स्वच्छ पार्ने र तापक्रमलाई संन्तुलित गर्ने ग) पवित्र वाग्मती र विष्णुमती नदीको उद्गमस्थल, वाग्मती, विष्णुमती, नदीहरुको जलाधार क्षेत्रको व्यवस्थापन घ) मध्य पहाडी भूभागको जैविक विविधताको संरक्षण र ङ) उत्तर र दक्षिण जोड्ने महत्वपूर्ण जैविक मार्ग च) अन्तर्राष्ट्रिय संरक्षण समुदायले महत्वपूर्ण चरा र जैविक विविधता क्षेत्रको घोषणा गरिएको क्षेत्र छ) नेपालको राजधानी काठमाडौँबाट नजिकै रहेको मुख्य पर्यटकीय गन्तव्यस्थल ज) जैविक विविधता, धार्मिक एवं सांस्कृतिक अध्ययन अनुसन्धानको लागि उपयुक्त क्षेत्र र झ) विद्यार्थी र अनुसन्धानकर्ताका लागि अध्ययन केन्द्रको रुपमा रहेको छ । यस राष्ट्रिय निकुञ्जको उल्लेखित उपादेहताका बाबजुद पनि निकुञ्जको सांगठनीक संरचना, सरोकारवाला निकायसँगको अप्रर्याप्त समन्वय र सहकार्य, जीविकोपार्जनका लागि निर्वाह खालको कृषि प्रणालीमा निर्भरता नै यस राष्ट्रिय निकुञ्ज संरक्षणका मुख्य चुनौतिहरु हुन् । त्यसैगरी विगत १० वर्षसम्ममा मध्यवर्ती क्षेत्र घोषणा हुन ढिलाई हुँदा स्थानीय समुदायमा मानव वन्यजन्तु द्वन्द्व न्यूनीकरण, पर्यापर्यटनको विकास, संरक्षण, सीप विकास, आयमूलक कार्यक्रम र संरक्षण चेतनाको अभिबृद्धि कार्यक्रम सञ्चालनमा कठीनाई उत्पन्न भइरहेको छ ।

यो निकुञ्ज क्षेत्रभित्र चार किसिमका वनका प्रकारहरु पाइन्छन् । वनको विविधताका कारण यो क्षेत्रमा संरक्षित, दूर्लभ, लोपोन्मुख, संकटापन्न र रैथाने प्रजातिका वनस्पति र जीवजन्तुको विविधता रहेको छ । यहाँ पाईने १४०२ प्रजातिका वनस्पति मध्ये हालसम्म १,११४ प्रजातिका फूलफूल्ने र २८८ प्रजातिका फूलनफुल्ने वनस्पति रेकर्ड गरिएको छ । त्यसैगरी यो निकुञ्ज सुनगाभा र सुनाखरीको विविधताले भरिपूर्ण रहेको छ । नेपालमा पाईने सुनगाभा र सुनाखरी मध्ये करिव एक तिहाई अर्थात १२३ प्रजातिका सुनगाभा र सुनाखरीका प्रजातिहरु यहाँ रेकर्ड गरिएका छन् । त्यसैगरी १३१ प्रजातिका pteridophytes, त्यति नै संख्यामा जडिबुटीका प्रजातिहरु रेकर्ड गरिएका छन् । यहाँ १२४ प्रजातिका पुतली तथा मथहरु, १२२ प्रजातिका किटपतंग, ३२० प्रजातिका पंछी, ३० प्रजातिका स्तनधारी

वन्यजन्तुको तथ्याङ्क रेकर्ड गरिएकोछ । तीमध्ये सालक, चरी बाघ, ध्वाँसे चितुवा, चितुवा, घोरल, हिमाली कालो भालु, पहरे बाँदर आदि गरी ९ प्रजातिका वन्यजन्तु संकटापन्न सूचिमा सूचिकृत छन् ।

यस निकुञ्जको मध्यवर्ती क्षेत्र काठमाडौ, नुवाकोट, सिन्धुपाल्चोक र धादिङ जिल्लाको ककनी र शिवपुरी गरी दुई वटा गाउँपालिका शंखरापुर, कागेश्वरी मनोहरा, गोकर्णेश्वर, बूढानीलकण्ठ, टोखा, तारकेश्वर, नागार्जुन, मेलम्ची र धुनीवेशी समेत ९ वटा नगरपालिकाको ११८.६१ वर्ग किलोमिटर क्षेत्रफलमा फैलिएको छ । यस क्षेत्रमा मुख्यत: तामाङ, ब्राह्मण, क्षेत्री र अन्य जातिहरुको बसोबास रहेको छ । वि.सं. २०७३ (सन् २०१६) को सर्भेक्षण अनुसार यस क्षेत्रमा ५६,४७४ जनसंख्या रहेको पाइन्छ भने उनीहरुको मुख्य पेशा कृषि, पशुपालन, सरकारी नोकरी, ज्याला मजदुरी, वैदेशिक रोजगारी, पर्यटन व्यवसाय आदि रहेका छन् ।

विगत आधा दशकको तथ्याङ्को विश्लेषण गर्दा वार्षिक औसत १ लाख ६७ हजार ५ सय पर्यटकहरु यस राष्ट्रिय निकुञ्जमा अवलोकन भ्रमणमा आउने गरेको देखिन्छ । गत आ.व.०७३/०७४ को तथ्याङ्कलाई हेर्दा १६,५३९ जना विदेशी र १,९३,१७८ जना स्वदेशी गरी जम्मा २,०९,७१७ जनालाई निकुञ्ज प्रवेश गरेको देखिन्छ । यस राष्ट्रिय निकुञ्जका मुख्य पर्यटकीय गन्तव्यस्थलहरु मध्ये सुन्दरीजल, वागद्वार, विष्णुद्वार, नागीगुम्बा, शिवपुरी पहाड, जामाचो, पचली भैरव, इचंगु नारायण, नागार्जुन पहाड आदि रहेका छन् ।

स्थानीय समुदायको सर्वोपरि हितका लागि जैविक विविधता र जलाधार क्षेत्रको समुचित संरक्षण गर्ने विषयलाई जोड दिने यस व्यवस्थापन योजनाको दूरदृष्टि रहेको छ । त्यसैगरी निकुञ्ज र मध्यवर्ती क्षेत्रको जैविक विविधता एवं प्राकृतिक सम्पदाको दिगो संरक्षण र उपयोग गर्नु यस व्यवस्थापन योजनाको मुख्य लक्ष्य रहेको छ ।

यस व्यवस्थापन योजनाका उद्देश्यहरु निम्न बमोजिम छन् :

१. संरक्षित, विश्वमै संकटमा परेका र रैथाने वनस्पति र वन्यजन्तुका प्रजाति, पारिस्थिकीय प्रणाली र वन्यजन्तुहरुको बासस्थान संरक्षणमा विशेष ध्यान केन्द्रित गर्दै जैविक विविधताको संरक्षण गर्नु,

२. मध्य पहाडी क्षेत्रको पारिस्थिकीय प्रणालीको प्रतिनिधित्व गरेको पर्यावरणीय प्रकृयाहरुलाई दिगो रुपमा संरक्षण गर्नका लागि वन्यजन्तुहरुको बासस्थानलाई व्यवस्थापन गर्नु,

३. पानीका स्रोत, जलिय प्रणाली र प्रकृयाको दिगो संरक्षण तथा सुधार गर्नका लागि पवित्र वाग्मती र विष्णुमती नदीहरुको जलाधार क्षेत्रको व्यवस्थापन गर्नु,

४. प्राकृतिक स्वरुपमा कुनै दख्खल नपारी प्राकृतिक, सामाजिक र सांस्कृतिक सम्पदामा प्रतिकूल असर नपर्ने गरी दिगो तथा वातावरण मैत्री पर्यापर्यटनको विकास गर्नु,

५. मध्यवर्ती क्षेत्रका स्थानीय समुदायको आर्थिक सामाजिक अवस्थामा सुधार, मानव वन्यजन्तु द्वन्द्व न्यूनीकरण, वनको संरक्षण तथा विकास, पर्यापर्यटनको विकास र संरक्षण चेतना अभिबृद्धिका माध्यमबाट जैविक विविधता संरक्षणमा स्थानीय समुदायको सक्रिय सहभागिता हासिल गर्नु,

६. अध्ययन अनुसन्धान, क्षमता अभिबर्द्धि, समन्वय तथा सहकार्यका माध्यमबाट निकुञ्जका कर्मचारी, निकुञ्ज सुरक्षार्थ तैनाथ नेपाली सेना र स्थानीय समुदायको संस्थागत क्षमता अभिबृद्धि गर्नु ।

व्यवस्थापन योजनाका लक्ष्य र उद्देश्यहरु निकुञ्ज व्यवस्थापन, जलाधार र सिमसार क्षेत्र व्यवस्थापन, मध्यवर्ती क्षेत्र व्यवस्थापन, पर्यापर्यटन व्यवस्थापन र संस्थागत विकास गरी मुख्यत: पाँच खण्डमा बाँडिएको छ । व्यवस्थापन योजनाका लक्ष्य हासिल गर्न निश्चित क्रियाकलाप सहित कार्यगत उद्देश्यहरु तर्जुमा गरिएको छ । वर्तमान योजनामा समेटिएका क्रियाकलापहरु, व्यवस्थापन प्रणाली, छलफल, अन्तर्क्रिया र कार्य क्षेत्रको अवलोकन तथा निरीक्षणलाई आत्मसात गर्दै रणनीतिका आधारमा क्रियाकलापहरु निर्धारण गरिएका छन् ।

निकुञ्जको संरक्षण र व्यवस्थापनको लागि रु.५७ करोड ४३ लाख ५० हजार र मध्यवर्ती क्षेत्रको व्यवस्थापनको लागि रु.२७ करोड ५० लाख गरि जम्मा रु.८४ करोड ९३ लाख ५० हजारको बजेट प्रस्ताव गरिएको छ ।

ACRONYMS

^{0}C	Degree Centigrade
APO	Anti-Poaching Operation
AoR	Area of Responsibility
BBCC	Bagmati Bishnumati Conservation Club
BCN	Bird Conservation Nepal
BRBIP	Bagmati River Basin Integrated Programme
BS	Bikram Sambat
BZ	Buffer Zone
BZMC	Buffer Zone Management Committee
BZCFUG	Buffer Zone Community Forest User Group
BZUC	Buffer Zone User Committee
BZUG	Buffer Zone User Group
CBAPU	Community Based Antipoaching Unit
CF	Community Forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DADO	District Agriculture Development Office
DAG	Disadvantaged Group
DCC	District Coordination Committee
DFO	District Forest Office
DLSO	District Livestock Service Office
DNPWC	Department of National Parks and Wildlife Conservation
FAO	Food and Agriculture Organization
FY	Fiscal Year
GESI	Gender Equality and Social Inclusion
GIS	Geographical Information System
GO	Government Organization
GPS	Global Positioning System
GoN	Government of Nepal
Ha.	Hectare
HAN	Hotel Association of Nepal
HH	Household
HRD	Human Resource Development
HWC	Human-Wildlife Conflict
ICIMOD	International Centre for Integrated Mountain Development
IoF	Institute of Forestry
IGA	Income Generation Activity
INGO	International Non-Governmental Organization
IUCN	International Union for Conservation of Nature and Natural Resources

Km	Kilometer
Km^2	Square Kilometer
KMTNC	King Mahindra Trust for Nature Conservation
LAC	Limit of Acceptable Change
LHF	Leasehold Forest
MoFE	Ministry of Forests and Environment
MIST	Management Information System Tool
NBSAP	National Biodiversity Strategy and Action Plan
np	Nepal
NPR	Nepalese Rupee
NTFPs	Non-timber Forest Products
NTNC	National Trust for Nature Conservation
PA	Protected Area
PES	Payment for Environment Services
PRA	Participatory Rural Apprisal
SAARC	South Asian Association for Regional Cooperation
SAWEN	South Asia Wildlife Enforcement Network
SNNP	Shivapuri Nagarjun National Park
SOP	Standard Operating Procedure
SWOT	Strength Weakness Opportunity Threat
TAAN	Travel Agency Association of Nepal
TNA	Training Needs Assessment
TOT	Training of Trainers
UNDP	United Nations Development Programme
VDC	Village Development Committee
WCCB	Wildlife Crime Control Bureaue

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Title	Shivapuri Nagarjun National Park and Buffer Zone
Location	Central Nepal
Gazette notification	Shivapuri Watershed and Wildlife Reserve (1983); Shivapuri National Park (2002), Shivapuri Nagarjun National Park (2009), Buffer zone (2016)
IUCN category	National Park II
District (s)	Kathmandu, Nuwakot, Sindhupalchowk and Dhading
Coordinates	Shivapuri : Latitude 27^0 43' - 27^0 52' N, Longitude 85^0 13' - 85^0 45' E Nagarjun : Latitude 27°43' to 27°46' N and Longitude 85°13' to 85°18' E
Physiographic zone	Middle Mountain
Major landscapes	Shivapuri, Nagarjun, Kakani, Manichud, Chisapani
Total area	159 km^2 (Shivapuri :144 $km^2$and Nagarjun: 15 km^2)
Elevation range	960 m - 2732 m
Climate and weather	Monsoonal climate
Bioclimatic zone	Mid Hills
Average temperature	Maximum (22.7^0), Minimum (0.30^0 C)
Mean annual rainfall	2727 mm
Park headquarters	Panimuhan, Budhanilkantha, Kathmandu
Park Posts and Entry Piont	13 (in 3 Sectors: Sundarijal, Dhakalchaur and Nagarjun)
Nepal Army protection unit	12 Security posts in Shivapuri (Lipikot Barrack) and 8 Security posts in Nagarjun (Nagarjun Barrack)
Biodiversity:	Flora and Fauna
Flora /Forests	Four types of forest: Lower mixed hardwood forest, Chirpine forest, Upper mixed hardwood forest, and Oak forest
Flowering plants	1114 species
Economic plants	102 species of medicinal plants, 49 species of edible plants
Endemic plants	16 species
Fauna	124 species of butterflies, 30 species of mammals, 320 species of birds
Buffer Zone	Declared in 2016
Area and Coverage	118.61km^2, Former 29 VDCs (total and partial) and 149 wards adjoining the park area (9 Municipalities and 2 Rural Municipalities) of Kathamandu, Nuwakot, Sindhupalchok and Dhading
Major ethnic groups	Tamang, Brahmin, Chhetri, and others
Population	12,352 HHs, 56,474 population with 27,797 female and 28,677 male (SNNP survey, 2016)
Occupation	Agriculture, animal husbandry, daily wage labor

Tourism: Major attractions	*Shivapuri*: Bagdwar, Sundarijal, Bajrayogini, Bishnudwar, Bishnudwar, Manichud, Naagigumba, Sundarijal, Tarkeshowar *Nagarjun*: Ichangu Narayan, Jamacho, Pachali Bhairab
Annual tourist visit	1,32,697 (domestic), 10,655 (foreigner) from July 2015 to June 2016)
Annual revenue collection / trend	Rs. 161, 59,847.60 in FY (072/073) / increasing
Major Issues	Human Wildlife Conflict, dependency on park resources, poverty, encroachment, forest fire, water pollution and poor tourism infrastructure

Major legal provisions and arrangements related to PAs and biodiversity conservation

National policies and legislations
Climate Change Policy, 2011
National Wetland Policy 2013
Forest Policy, 2071
National Conservation Strategy for Nepal 1988
National Biodiversity Strategy and Action Plan (20014-2020)
Nepal Environment Policy and Action Plan 1993
National Parks and Wildlife Conservation Act 2029 B.S. (1973) and amendments
International Trade in Endangered Wildlife and Plants Control Act, 2074 (2017)
Forest Act, 1993
Environment Protection Act 2053 BS (1996)
Water Resources Act 1992
Aquatic Animal Protection Act 1961
NPWC Regulations 2030 B.S. (1974) and amendments
Environment Protection Regulation 2054 BS (1997)
Buffer zone Management Regulations 2052 BS (1996)
SNNP Buffer Zone Management Guidelines, 2073 B.S. (2017)
International conventions and treaties
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1975
Convention on Biological Diversity 1992
United Nations Framework Convention on Climate Change 1992

1.1 Approaches and Methods

Reviewing and updating of management plan of SNNP and buffer zone adopted a seven-step simple process that included literature review, field observations, consultations, analysis of information, draft preparation and review, central level workshop and incorporation of feedbacks and finalization of the plan .

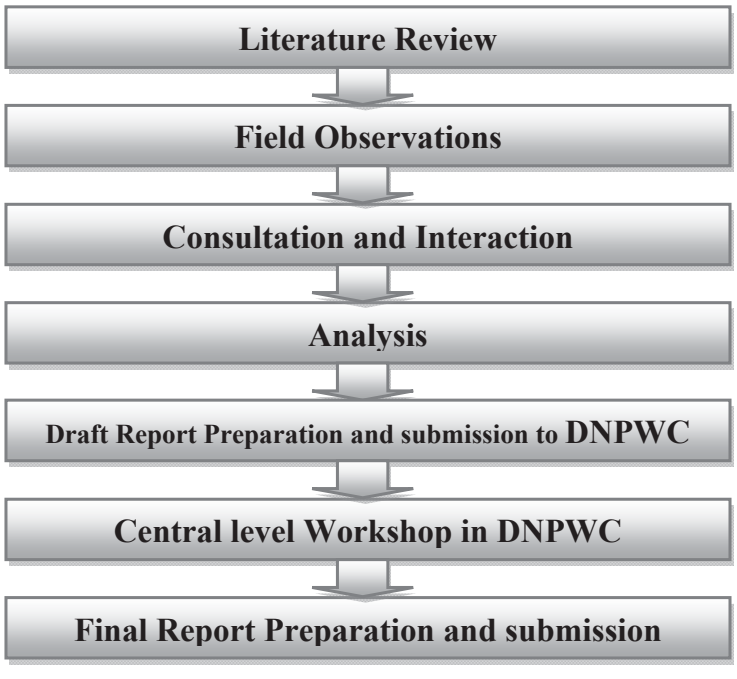


Figure 1: Steps in preparing Management Plan

1.1.1 Literature Review

Detail survey of relevant literature available in libraries was conducted. In addition online publications have been also accessed, and compiled. Approved management plan of Chitwan National Park and BZ, Sagarmatha National Park, Draft management plan of SNNP 1994 and 2016 have been consulted. This exercise was useful to find out gaps and recent progress on PA management, contemporary management issues and suitable programmes and activities.

1.1.2 Field visits and Observations

The management plan preparation team with experts visited the Park and BZ to observe existing management scenario and consult with BZ communities. Major management issues were identified prior to the visit in order to observe recent progress and gaps. Recent management challenges were also observed during the field visit.

Expert team members

1. Dr. Mohan Wagley, Former Planning Division Chief, MoFSC and DG, DSCWM-Watershed Expert
2. Mr. Shyam Sundar Bajimaya, Former DG, DNPWC- Buffer Zone Expert
3. Prof. Karan Bahadur Shah - Mammals and Herpetofauna Expert
4. Prof. Bhaiya Khanal, Ph.D - Insects including butterfly expert

5. Dr. B. K. Sharma -Plant Expert

6. Mr. Bhola Dhakal - GIS Expert

7. Mr. Bhogendra Rayamajhi - Avifauna Expert

1.1.3 Consultation and Interaction

A consultation meeting with experts was held at SNNP headquarter, Panimuhan on April 6, 2017. The discussion was mainly focused on Management Plan prepration planning. Similarly, formal and informal interaction meetings were held at the park with Nepal Army, park staff, BZUC chairpersons, office assistant, social mobilizers, BZ UGs/ UCs at various stages.

1.1.2 Analysis and Drafting

The collected information was analyzed qualitatively and the results were used to refine the vision, goals and objectives of the park and buffer zone outlined during the consultation meeting held on May 16, 2017. These goals and objectives led to designing strategies and activities which were brought into a logical framework for an easy monitoring and evaluation of the plan. Then, a Draft Plan was prepared, reviewed internally and submitted to DNPWC for critical review.

Part A
The Existing Situation

CHAPTER 1

Introduction of the Protected Area

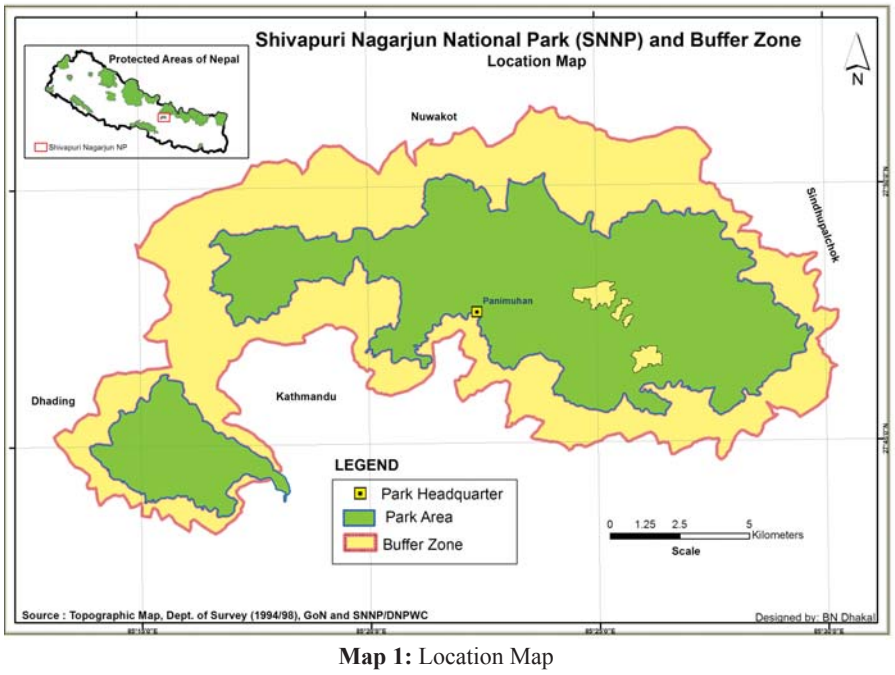
1.1 Name, Location, Constitution and Extent

1.1.1 Name

Shivapuri Nagarjun National Park

1.1.2 Location

Geographically Shivapuri forest located within 27°45' to 27°52' N latitude and 85°16' to 85°45' E longitude and Nagarjun forest is located within 27°43' to 27°46' N latitude and 85°13' to 85°18' E longitude. It covers parts of Kathmandu, Nuwakot, Sindhupalchowk and Dhading districts of Central Nepal and elevation range from 960 (Narsingh Ghat) to 2732 (Shivapuri peak) from msl. Out of 20 protected areas of Nepal, it is the only protected area that falls entirely within the middle mountain range of central Nepal and represents its biodiversity.



Map 1: Location Map

1.1.3 Constitution and Extent

Shivapuri Nagarjun National Park (SNNP) initially established as Shivapuri Watershed Conservation Area in 1976, Shivapuri Protected Watershed Area in 1978, as Shivapuri Watershed and Wildlife Reserve in 1983, as Shivapuri National Park (144 km^2) gazette in 2002 and Nagarjun forest area (15 km2) was added and renamed as SNNP in 2009 under National Park and Wildlife Conservation

Act, 1973. It is situated on the Northern fringe of Kathmandu valley, and the Park headquarters (Panimuhan) is just 12 km away from the center of Kathmandu city (Sundhara) (Map 2).

SNNP is linked with road-networks from the Kathmandu city to its entrance gate Panimuhan/ Budanilakantha, Jagaat/Tokha, Sundarijal and Fulbarigate/Nagarjun. The Park is surrounded by 111 km long mud mortar stone-wall in Shivapuri and 29 km in Nagarjun sector. Inside the park, in Shivapuri block there are 95 km long forest road and 83 km foot trails constructed for trekking and jungle walk. In Nagarjun sector there are 31 km long forest road and 9 km foot trails constructed for nature hiking and jungle walk. The park is a true representation of the mid hills in the protected area system of Nepal.

The park area is surrounded by heavy sub-urban population. The buffer zone (BZ) of SNNP was declared in the year 2072 (2016). It covers an area of 118.61 km^2. occupying the part of the Kathmandu, Nuwakot, Sindhupalchok and Dhading districts of central Nepal. A total of 56,474 (female- 27,797, male- 28,677) population reside in total 12,352 household in the BZ. The ultimate goal of buffer zone is to achieve the active people's participation for the biodiversity conservation of national park and buffer zone. There are two objectives of BZ, the first one is to conserve and manage forests in the BZ to fulfill the daily basic needs of forest products to the local communities residing in the periphery of the SNNP. Second objective is to plough back 30-50% of its annual income of SNNP for the upliftment of socio-economic condition of the buffer zone communities. The major programmes of BZ are conservation, human wildlife conflict mitigation and compensation, community development, ecotourism development, skill and income generation and conservation education.

Table 1: Area coverage of SNNP

SN	Locality	Area (square kilometer)				
		Sindhupalchok	Nuwakot	Dhading	Kathmandu	Total
1	Shivapuri area	13	36	0	95	144
	%	9.03	25.00	0.00	65.97	100
2	Nagarjun area	0	0	7.3	7.7	15
	%	0.00	0.00	48.67	51.33	100
	Grand total	13	36	7.3	102.7	159
	% (Both)	8.18	22.64	4.59	64.59	100.00

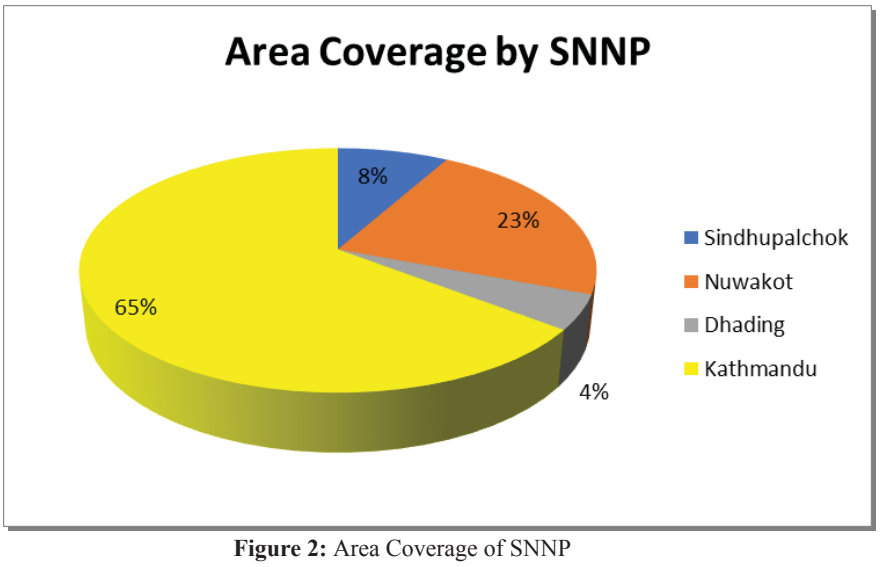
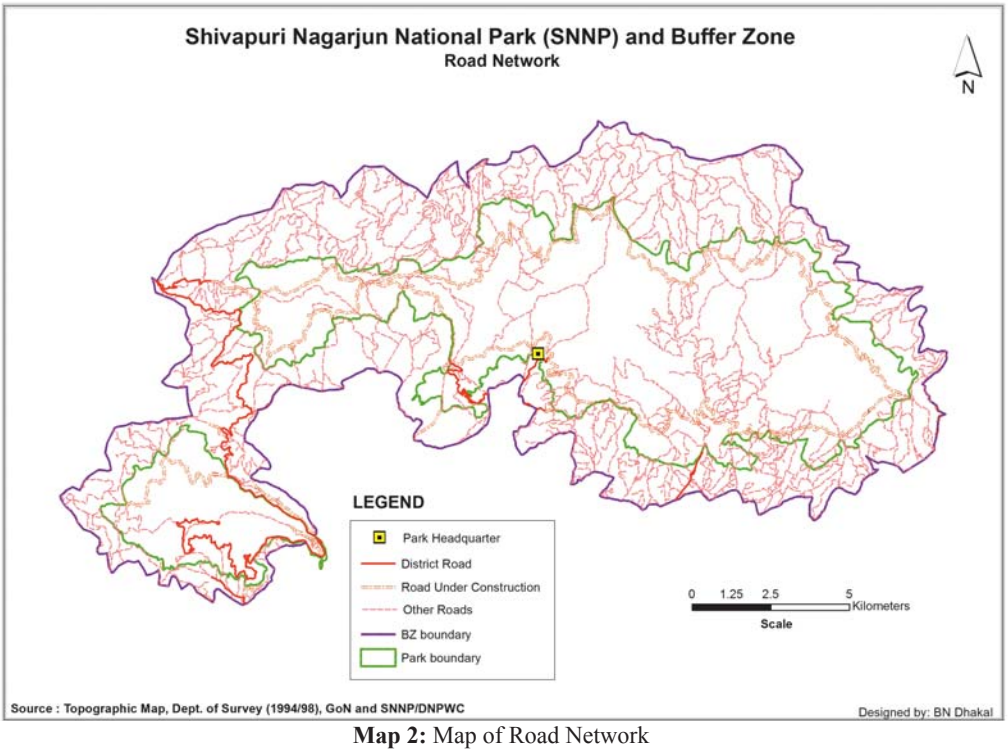


Figure 2: Area Coverage of SNNP

1.2 Access

SNNP is connected with networks of roads and trekking routes. The public buses and microbuses services are available to reach the park entry points. Common routes are Sundhara - Jamal - Maharajgunj - Budhanilkantha - Panimuhan - Baghdhwor, Sundhara - Chabahil - Sundarijal - Mulkharka - Chisapani, Sundhara - Chabahil - Sankhu - Manichud, Sundhara - Jamal - Samakhusi - Tokha - Jhor - Gurjebhanjyang, Sundhara - Jamal - Balaju - Fulbarigate - Jamacho, Sundhara - Jamal - Balaju - Kakani. Visitors can enter into the park through the following 9 entry points viz. Chisapani, Jhule, Sundarijal, Mahankal, Panimuhan, Tokha/lipikot, Jagaat/Gurjebhanjyang, Kakani, Mudhku, and Fulbarigate/Nagarjun paying entry fees on site.



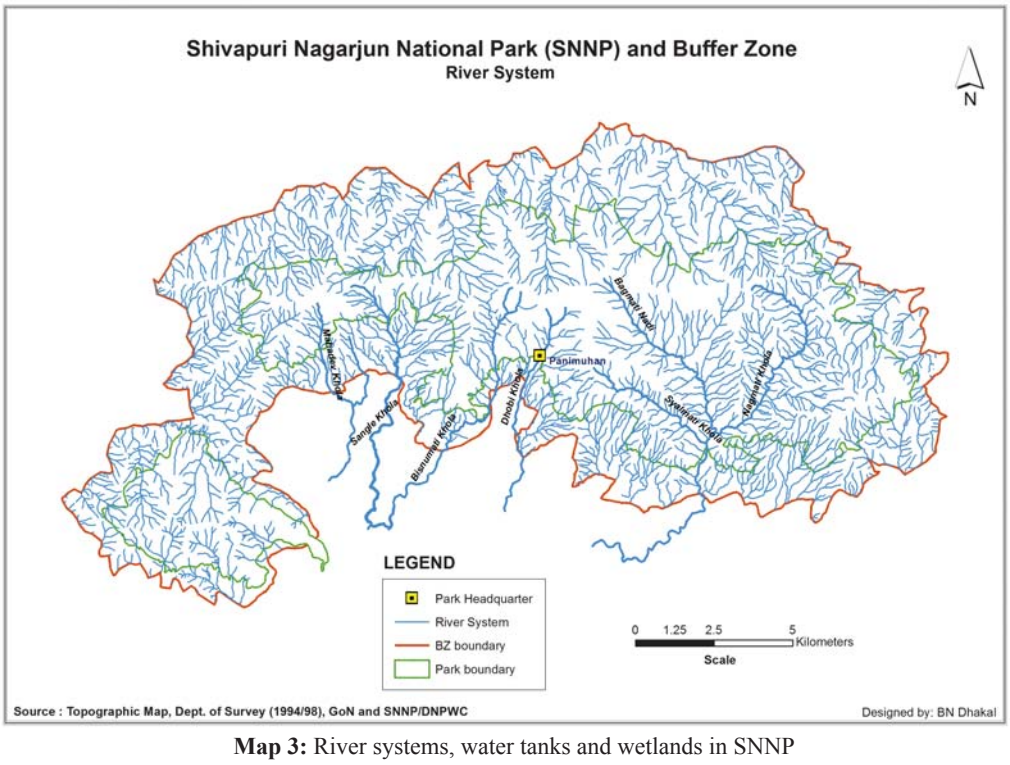
Map 2: Map of Road Network

1.3 Statement of Significance

SNNP was initially established as watershed conservation area for conservation and management of watershed of Holy rivers Bagmati and Bishnumati. Rana royalties collected water from the foothill of Shivapuri Mountain is called Muhaan pokhari or Paanimuhan since 1950 B.S. (1893 AD). The Park signifies high biological and cultural diversity. Some of the significant highlights of the park are:

1. Source of Fresh Water and Watershed of Holy Rivers Bagmati and Bishnumati:

SNNP is a water tower for Kathmandu valley and buffer zone communities of SNNP fulfilling nearly 50 percent of the water demand for Kathmandu valley population. More than 30 million liters of water is tapped daily from Bagmati, Syalmati, Bishnumati, Rudramati, Sangala, TusalKhola, Salinadi, MahadevKhola, Nagmati by Kathmandu Upatyaka Kanepani limited (KUKL) for supplying drinking water to Kathmandu valley. The largest one is Sundarijal catchment (32.7 km2), which drains into Bagmati. Besides, drinking water SNNP largely supports the ground water recharge, hydroelectricity production and irrigation facilities in agricultural fields of downstream especially in Kathmandu Valley.



Map 3: River systems, water tanks and wetlands in SNNP

Watershed management and conservation of Holy rivers viz. Bagmati, Bishnumati, Trisuli, and Indrawati are the prime significance of this park. It reduces soil eosin and landslides in the watershed. So, it reduces property and human loss from flooding and safeguards the agriculture land in the down stream.

2. Region of rich biodiversity conservation:

The park harbors representatives of biodiversity hotspot of the mid–hill of central Nepal. The park symbolizes high biological and cultural diversity. It consists of a total of 1402 plant species and of which 16 species are endemic. Angiosperms are the dominating flora of the park comprising 1114 species. Faunal diversity of the park includes 30 species of mammals among them six species are threatened. Two species of Pangolin, Leopard cat, Clouded leopard, Assamese monkey are listed in protected animals under the National Parks and Wildlife Conservation Act, 2073. Common Leopard, Langur, Himalayan Black Bear, Yellow Throated Martin, Barking Deer and Samber Deer are found in the park. Similarly, the region is home to 320 species of birds (SNP and BCN 2007), Likewise, 9 amphibians and 20 reptiles in the park (Shah, 2016) and 108 species of butterflies are found (Khanal, 2009) in SNNP.

3. Cultural heritage:

Shivapuri peak and Jamacho are the holy shrines for both Hindus and Buddhists while the holy rivers Bagmati and Bishnumati originates from Bagdwar and Bishnupaduka respectively. Jamacho, Buddha Gufa, Pachali Bhairab at Nagarjun are also famous religions sites in the park. Baghdhowar, Bishnudhowar, Sundarimai, Kageshowori, Manichud, Tarakeshowr and Nagigumba are the popular religious sites in the park.

CHAPTER 2

Background Information and Attributes

2.1 Boundaries

2.1.1 Legal

Covering an area of 159 km^2 of Kathmandu, Nuwakot, Dhading and Sindhupalchok districts of central Nepal, the park stretches about 20-24 km East-West and about 8-10 km North-South in Shivapuri with 144 km^2 and a separate patch of Nagarjun forest of 15 km^2. The park boundary is well demarcated with stone wall around the Park. The boundary wall runs along number of former Village Development committees (VDCs) that include Talakhu, Chhap, Likhu, Sikere, Samundradevi, Sunkhani and Thanapati of Nuwakot District in the North and Jitpurphedi, Kavresthali, Sangla, Jhormahankal, Tokha Chandeshori, Bisnu-Budhanilkantha, Chapali Bhadrakali, Baluwa, Nayapati, Sundarijal, Gagalphedi, Bajrayogini and Lapsiphedi of Kathmandu district in the South. Bhotechaur and Haibung of Sindhupalchok district lies in the Eastern boundary while Okharpauwa and Kakani of Kakani Rural municipality of Nuwakot district lies in the Western boundary of the Park in Shivapuri area. Similarly, the Nagarjun patch is also well demarked by 29 km long boundary wall and runs along Bhimdhunga, Ramkot, Ichangunarayan, Goldhunga, Jitpurphedi and Chhatredeurali former VDCs.

Boundary of Shivapuri Nagarjun National Park

A. **Shivpuri block**

East: - From Manichur *lek,* through Haibung to Chisapani (the tri-district meeting point of the boundary of Kathmandu, Nuwakot, Sindhupalchok).

West: Along the side of the Neupane village of Nuwakot to the boundary of Kakani Agriculture Farm, to motor road toward Khanikhola trishuli to Panchmane.

North:- From the top of Neupane gau to Khari Bhanjyang, to the top of Gurung gau village, to Gurje, to Arkhaule, to Siketar village to Bhorlang danda to Haibung.

South:- Panchmane to Dhalkechhap, to Alle devisthan, to boundary of Kateri village, to Lamichhane village, to the top of Sangla, to Jhor village, to Taulung village, to Tarebhir of Baluwa VDC, to Sundarijal and Mahankal, to Kafle danda of Gagalfedi to the trail from Manichur to Bajrayogini.

B) Nagarjun Block :

East:- From Dumrini, pani to Balaju bypass, to Balaju park, to the settlement of goldhunga VDC.

West: From Thumki, to Damdame, to Kakare village to Gairigau to the wall at Sanogau to the settlement at Chhatre deurali VDC of Dhading.

North:- From Tilkhoriya, to Dandagau, to Thulogau, to Chipalibot, to Mudkhudhoka, to Baikhu, to the wall at Nakhandol, to the settlement at Jitpurfedi and Goldhunga VDC.

South:- From Thaplegau, to Bhirkot Nayagau, to Badridanda, to Narayansthan, to Ichangu to Gangko, to Raniban to the wall at Tandol village.

Boundary of Buffer Zone

East: Pati Bhanjyang (X = 85.45627, Y = 27.84346) along the road to Sandantole, Haibung Mahadevasthan Secondary School, Gurung village and Soti river confluence upto main irrigation channel of Bhotechaur (X= 85.48860, Y=27.80983) . Continue to Khawas tole (X=85.49506, Y= 27.79706), Bhumethan hill and Motor way to Chauki Bhanjyang, Chiring river towards Ghatte River confluence. Further Motor way from Jhule Khola to Dhara Bhanjyang, Lama Nachne hill, Saile river to Manilingeshwor Mahadev river confluence.

South: Manilingeshwor Mahadev river confluence towards Bhorletar village (X= 85.43625, Y= 27.74962) along the road, Bagmati river bridge, Nayapati Chandikashwori Secondary School towards Dhoka Bhanjyang and Suryamati river confluence. Further straight along ridges of Koudol (X= 85.38248, Y= 27.76945) to Mailo Bhote rock and Badepakha to Rudreshwor Mahadev temple. Further along the river towards way to Taulung (X=85.36475, Y=27.78100) and Pancheshwor Manhadev temple, Chhoiling monastery, Bishnumati river towards Lude river confluence. Further straight to Tokha Ganesh temple and Sapana tirtha river towards way to Sangla, Kavresthali and Jitpurphedi connecting road (X=85.32686, Y=27.78505) towards Tinpiple market and Thanagadhi to Krishna Pranami temple. Further Ghampe river (X=85.28383, Y= 27.76070) to Phuyalthok, Gholdhunga's Nagarjun Secondary school and Nagin river to Lolang bridge and way to old Guheshwori temple towards Lakha Paata park boundary. Toudol Siddhi Ganesh temple motor way to Dalle junction, Nasidhoka junction, Tingharetallo junction, Gairi village, Halchowk to straight to the culvert of Bhadramati river (X=85.27119, Y= 27.72673), uphill to the confluence of the stream from dadagaun, to the road seto gumba through the stream to Sakhahiti river. Further by motor way to Sidheshwor Mahadev temple upto Bhimdhunga, Bhimsensthan temple and Mahesh Narayan river (X=85.22883, Y= 27.74120).

West: Mahesh Narayan river to Bhimdhunga Lamidada road to Bhangyang Pokhari. Further Siranchaur river, Ghatte river, Dhadebesi (X=85.23950, Y= 27.77430) to Kolpu and Naagdol river confluence. Further to Dandagau and Mahalaxmi temple to Kolpu river bridge. Further straight along river to Kaule Bhanjyang (X=85.24664, Y=27.81562) Swara river, Thansing village (X= 85.26108, Y= 27.82815) to old road uptoThulo Chhahare river.

North: Thulo Chhahare river to Thanapati temple, Moktan village, Kotthok village (X=85.31541, Y= 27.84698), Pandey tole, Gurje river confluence and Samundradevi temple. Further to Lapse river, Mohorthok Ghatta, Deureli Chiyandada top (X=85.37383, Y=27.84815) to Sikre river to Narsingh ghat of Likhu river upto Pati Bhanjyang.

2.1.2 Legislations

2.1.2.1 National Parks and Wildlife Conservation Act, 2029 (1973)

The Clause 3 (1 Ka) of the fifth amendment of NPWC Act, 2029 has made it mandatory that national park, wildlife reserve and conservation area has to be conserved and managed by the approved management plan. The management plan shall be approved by the DNPWC.

2.1.2.2 International Trade in Endangered Wildlife and Plant Control Act, 2074 BS, (2017)

International Trade in Endangered Wildlife and Plant Control Act, 2074, generally known as CITES Act, has recently been enacted. This Act has authorized Chief Conservation Officer or officer assigned by him/her of the protected area to work as Investigation Officer in illegal wildlife trade case and to file case in District Court as per the Clause 23.

2.1.2 Ecological

It is the only protected area that falls entirely within the middle mountain range of Nepal and represents its biodiversity. The name of the Park is derived from Shivapuri Peak of 2,732 m altitude and Nagarjun forest. Nagarjun forest is the separate island and there is no more forest corridor between Shivapuri and Nagarjun forest.

2.2 Geology and Soil

- ***Geology***

  Physio-graphically, SNNP lies in a transition zone between subtropical and temperate region. The dominant rocks are gneiss and magnetite with mica schist and pegmatic granite. The soils of the area range from loamy sand on the northern side to sandy loam on the southern slope.

- ***Land Use***

  The land use pattern in and around SNNP is predominated by forest followed by shrub land, cultivated land and grass land respectively. The cover of forest land is 118.391 km^2 (74.45%), followed bush/shrub land 32.52 km^2 (20.45%), grassland 5.13 km^2 (3.22%), cultivated land 2.86 Km^2 (1.80 %) and other features such as cliffs, building, pond/ lakes cover holds 0.088 Km^2 (0.055 %) (SNNP, 2017).

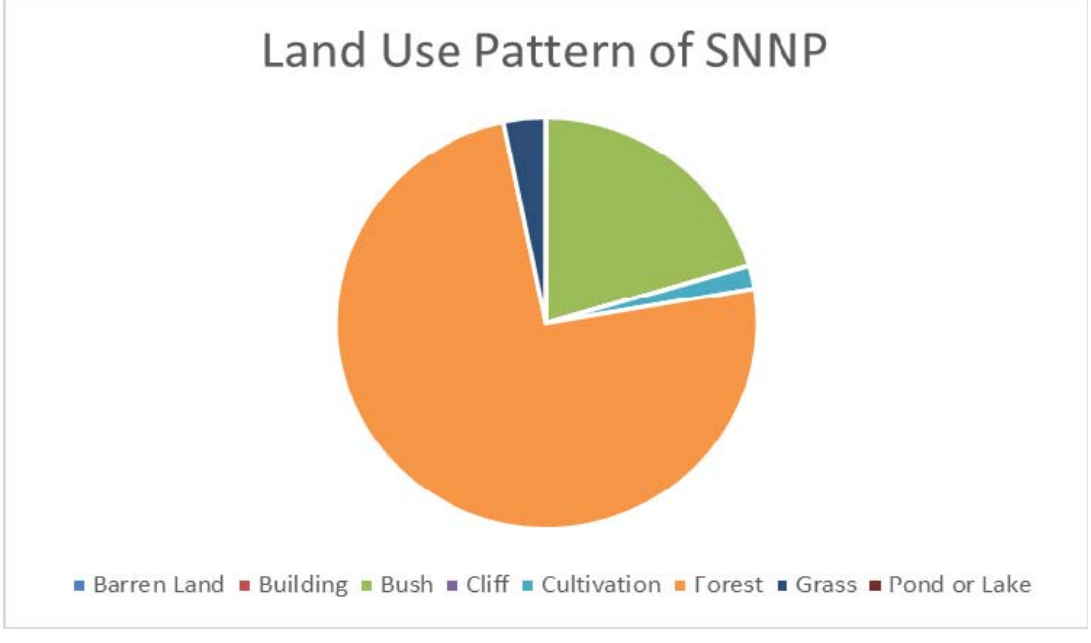
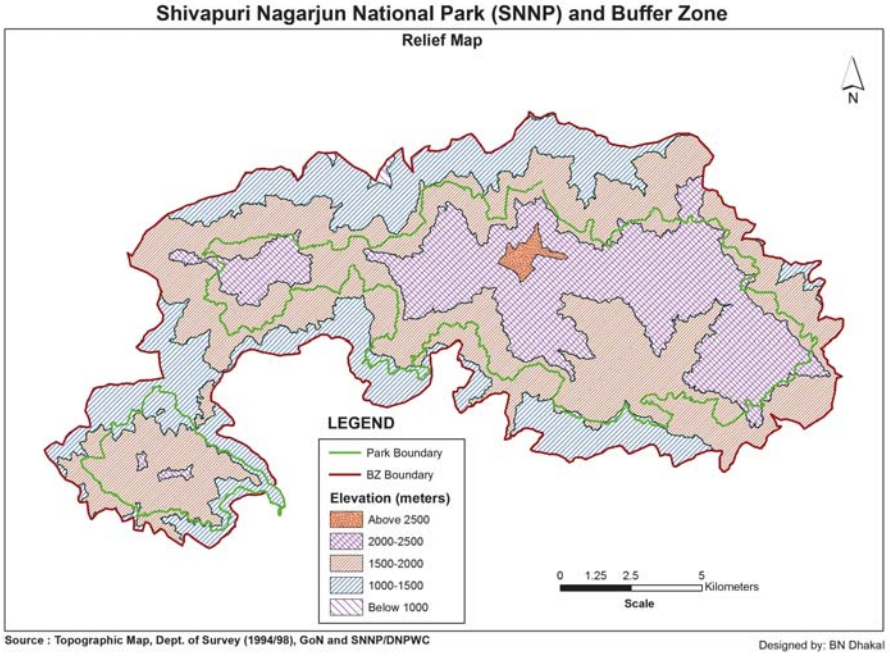


Figure 3: Land use pattern in SNNP

2.3 Topography and Drainage

2.3.1 Topography

Topography of SNNP is mostly mountainous with steep slopes of >30 % at least in 50% of the total area of the park. Because of the steep topography and the nature of soil, soil erosion is very high particularly in the northern part of the park (Samundradevi, Sikre and Talakhu villages). Landslides, gullies, sheet erosion in the sloping terraces, and stream bank erosion are common in northern slope of Shivapuri block. Major causes of such hazards include construction of road on steep southern and northern slopes, seasonal excessive forest fire and deforestation. Elevation of the park ranges from 960 m to 2732 msl at Shivapuri peak.

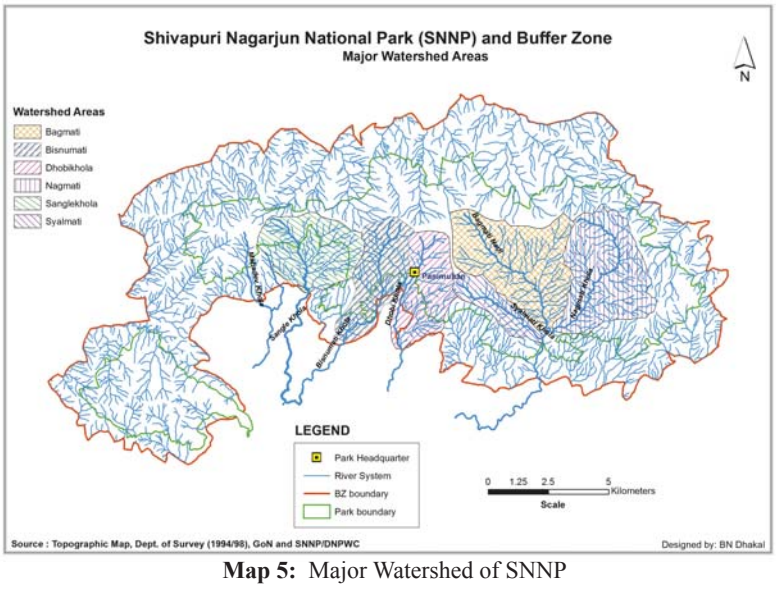


Map 4: Relief Map of SNNP

2.3.2 Drainage

Shivapuri is the origin of some important river systems including Bagmati, Bishnumati, Nagmati, Syalmati, Rudramati, and Ikshumati. There are some sub-watersheds of small streams including Rudramati, Mahadev, Chahari, Yagyamati, Sani and Thuli shyalmati and Dhobi Kholas. Tributaries of Likhu and Sindhu Khola draining to the Northern side also originate from the Park.

SNNP originated water ultimately reaches to the major rivers including Bagmati, Saptagandaki and Saptakoshi (SNNP 2063/064). Most of the wetlands drain to Bagmati catchment but few to Trishuli through Likhu khola towards North and few to Indrawati thourgh sindhu khola towards East (SNNP 2063/064). Bagmati, Syalmati, Nagmati, Bishnumati, Allekhola drains to Bagmati whereas Chisapani Khola, RolcheKhola, KakaniKhola drains to Trishuli river. Rivers like Nhyukhola, Thado Khola and Haibung khola joins Indrawati river (SNNP 2063/064). Man-made and natural reservoirs and ponds (e.g. Sundarijal and Dhap) are for specific purposes such as hydropower, drinking water, and irrigation. Rivers, streams, and reservoirs provide source of drinking water for wildlife, livestock, and people, irrigation for agriculture land and hydropower (Map 5).



Map 5: Major Watershed of SNNP

2.4 Climate

Shivapuri has subtropical to warm temperate climate. The 33 years (1985-2017 AD) climatic data of the weather station at Kakani (altitude 2066 m.) provided by Department of Hydrology and Meteorology shows the record of average maximum temperature of 19.9^{0}C and that of average minimum temperature of 11.15^{0}C. The mean annual precipitation was 236.5 mm mostly occurring during monsoon period.

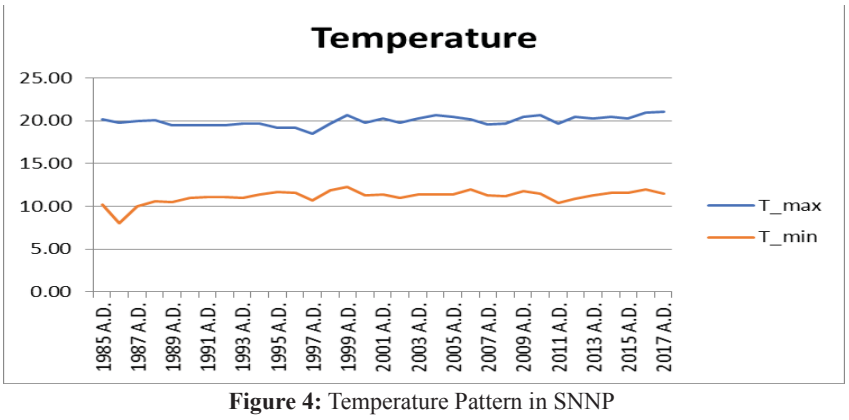


Figure 4: Temperature Pattern in SNNP

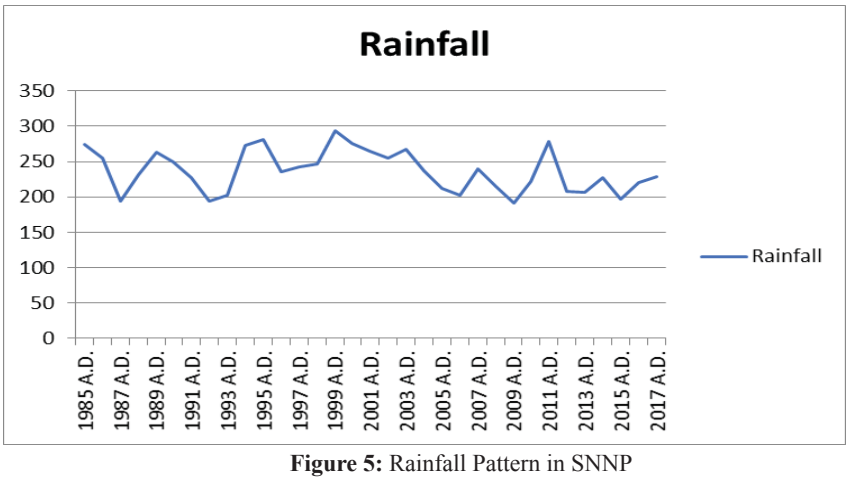


Figure 5: Rainfall Pattern in SNNP

2.5 Biodiversity Status

A. Floral Diversity

Floral diversity is quite high in SNNP due to its location, altitudinal and climatic variations. The park is located in sub-tropical and lower temperate zone of Nepal. It harbors a total of 1402 plant species. About 129 species of mushrooms and nearly 22 species of macro fungi have been reported. There are more than 1114 flowering plants including 16 endemic species. The SNNP comprises four types of forests viz. (i) Lower mixed hardwood forests, (ii) Chirpine forests, (iii) Oak forests and (iv) Upper mixed hardwood forests, which support rich faunal and floral diversity with a number of threatened and endemic wildlife species. *Schima wallichii, Castanopsis indica, Alnus nepalensis, Pinus roxburghii, Quercus semicarpifolia, Quercus lanuginose, Rhododendron arboreum* are the dominant vegetation in this park (SNNP, 2016).

2.5.1 Ecosystems

Distinct and diverse physiographic condition presents 5 ecosystem types and 4 forest types in SNNP (Table 2). Out of available 52 forest ecosystem types in the midhill physiographic region of Nepal, this national park represents 9.6% (n= 5) of them. These ecosystems of SNNP represents about 0.4% of their total area (20,970 km^2) within the country. Among the available ecosystem types, more area (3,769 ha) is occupied by "Collinean oak-mixed broadleaf forest" followed by "*Schima wallichii, Pinus roxburghii* mesohygrophytic" (2,545 ha) and "Mountain Oak (*Quercus semecarpifolia*)" (2,192 ha) respectively (Table 3).

Table 2: Ecosystem diversity of SNNP

SN	Categories	Number
1.	Forest types	4
2.	Ecosystem types	5
3.	Physiographic regions	1
4.	Climatic zones	2

Table 3: Area representation of Mid-hills ecosystems in SNNP (ha)*

SN	Ecosystem types	In SNNP	In Nepal	% in SNNP
1.	Mountain Oak (*Quercus semecarpifolia*)	2192	649000	0.3
2.	Collinean oak-mixed broadleaf forest	3769	542000	0.7
3.	*Schima wallichii*, *Castanopsis indica* hygroph	243	523000	0.05
4.	*Schima wallichii*, *Pinus roxburghii* mesohygrophytic	2545	223000	1.1
5.	*Pinus roxburghii* xerophytic forest	352	160000	0.2
Representation of Midhills ecosystems (%)				0.4

* Assessment was based on the areas inside Shivapuri Watershed and Wildlife Reserve (Source: BPP, 1996)

Park forests (n = 4) are distributed within the mosaics of middle hill physiographic region of two, subtropical and temperate, climatic zones. Lower mixed hardwood (Schima-Castanopsis) forest (1,000m - 1,500m), Chirpine forest (1,000m – 1600m), Upper mixed hardwood forest (1,500m - 2,300m) and Oak forest (2,300m – 2,700m) are principal forest types of SNNP.

2.5.2 Species

Though SNNP occupies 0.19% area of Nepal (147,181 km^2), it represents 8 % (n = 1,402) floral species available in the country (n = 17,199). In terms of number, angiosperms are the dominating flora of this park (n = 1,114) followed by fungi (n = 151), pteridophytes (n = 131) and gymnosperms (n = 6) respectively. The comparative data illustrated the higher representation of orchid's species (32.3%) (n=123) followed by monocot species (28.3%) and pteridophytes (24.5%) found in the country. This park incorporated 16 endemic plants representing 5.7% of the available endemic flowering plants (n = 282) of Nepal (Table 4).

Table 4: Plant Diversity of SNNP up to family level

Types	Number			Comparative Data	
	Family	Genera	Species	Total in Nepal	% in SNNP
Angiosperm	141	632	1402	6,973	17.9
Monocot	18	154	325	1150	28.3
Dicot	124	478	789	5,823	13.5
Endemic	--	--	16	282	5.7
Orchid	1	45	123	381	32.3
Gymnosperm	3	6	6	31	19.4
Pteridophytes	20	49	131	534	24.5
Fungi	--	--	151	2025	6.04

(BPP, 1995), (SNNP, 2010)

a. Noteworthy species

Among recorded flora of SNNP, one species is near threatened (*Juglans regia*) and one species is endangered (*Taxus wallichiana*). Based on the floral dispersal within the national park, 1400-1600m elevation ranges is floristically rich area (Figure no. 6). Total number of plant species recorded within these elevation ranges are 523 (BPP, 1995).

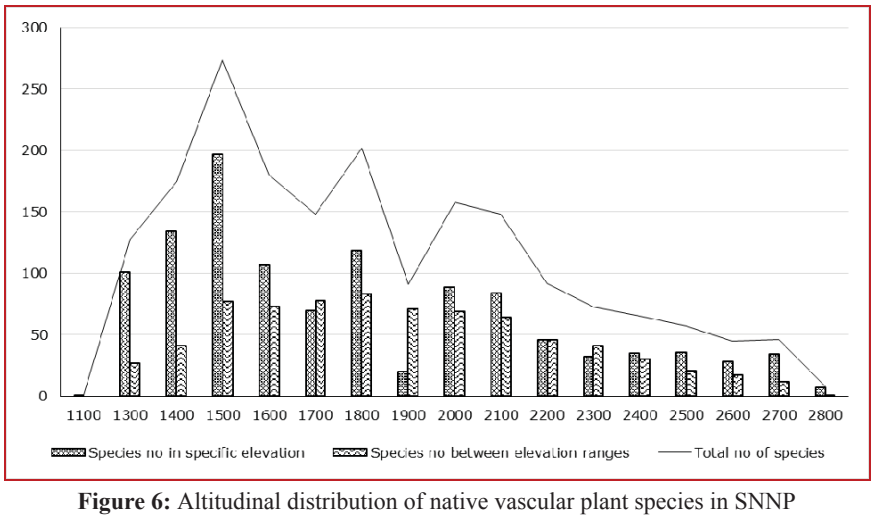


Figure 6: Altitudinal distribution of native vascular plant species in SNNP

2.5.3 Conservation significance

This national park includes nationally and globally threatened floral species. There are two species of nationally protected plant species in SNNP. Similarly, one endangered and one near threatened plant species are found in the park. There are 126 and 2 floral species enlisted in CITES II and III appendices respectively are available in SNNP (Table 5).

Table 5: Conservation significance of SNNP flora

Status	No in Nepal*	No in SNNP	% in SNNP
Endangered	2	1	50.0
Vulnerable	5	--	0.0
Near Threatened	2	1	50.0
GoN (Protected)	18	3	16.7
CITES I	2	--	0.0
CITES II	458	126	27.5
CITES III	4	2	25.0

***GoN/MoFSC, 2014**

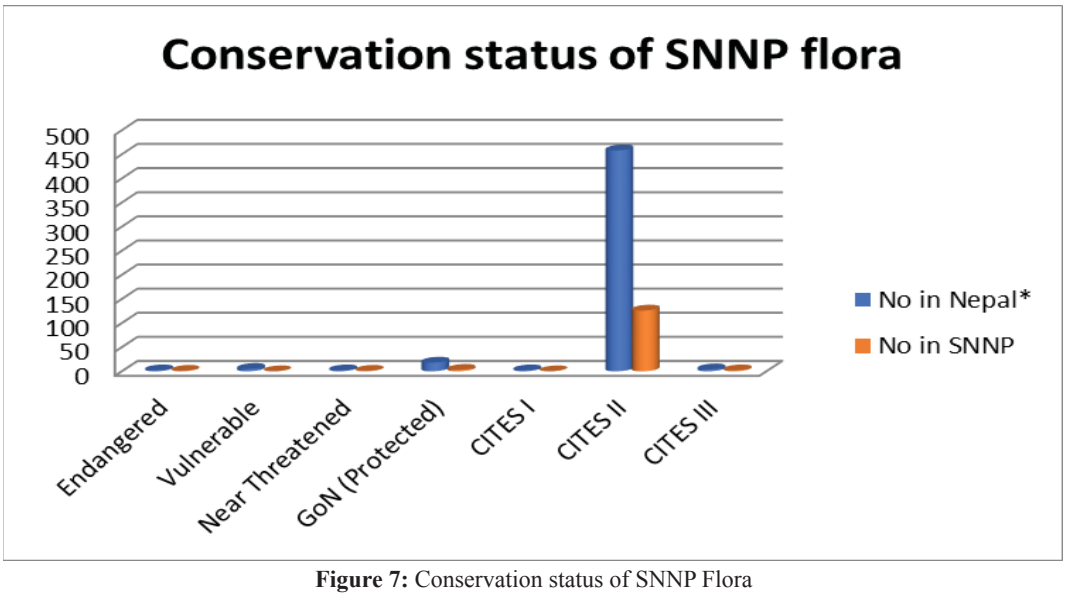


Figure 7: Conservation status of SNNP Flora

Table 6: Forest habitats and altitudinal distribution of Flora and Fauna in SNNP

Forest type or Habitat	Altitude (m)	Flora	Fauna
Lower mixed hardwood	1000-1500	*Schima wallichii* *Castanopsis indica* *Alnus nepalensis* *Anthocephalus cadamba* *Prunus cerasoides*	Wild boar (*Sus scrofa*) Barking deer (*Muntiacus muntjak*) Rhesus monkey (*Macaca mulatta*) Langur (*Semnopithecus schistaceus*) Indian hare (*Lepus nigricollis*)
Chir pine forest	1000-1600	*Pinus roxburghii* *Castanopsis indica* *Myrica esculenta* *Pyrus pashia*	Same as above

Forest type or Habitat	Altitude (m)	Flora	Fauna
Oak forest	2300-2700	*Quercus semecarpifolia* *Eurya acuminata* *Ilex dipyrena* *Michelia champaca* *Rhododendron arboreum* *Symplocos* species.	Wild boar (*Sus scrofa*) Barking deer (*Muntiacus muntjak*) Porcurpine (*Hystrix indica*)
Upper mixed hardwood forest	1500-2700	*Acer* species*, Aesculus indica, Alnus nepalensis, Betula alnoides, Celtis australis, Fraxinus floribunda, Juglans regia, Salix* species, *Quercus* species	Himalayan goral (*Naemorhedus goral*) Himalayan black bear (*Ursus thibetanus*) Yellow-throated marten (*Martes flavigula*) Wild boar (*Sus scrofa*)

(Source: Amatya 1993; Kattel 1993)

b. Faunal diversity

Butterflies and Insects

Nepal so far represents 660 species of butterflies which is 3.30% in global context (Smith 1989). More than 360 species of butterflies have been recorded in Kathmandu and its surrounding hills (Khanal and Smith 1997). Shivapuri Nagarjun National Park is one of the potential spots where distribution of butterflies has interestingly been displayed at different altitudinal pockets. Study conducted in the past revealed the existence of 108 species of butterflies in this park (Khanal, 2013). However, altogether 124 species of butterflies have been reported. Rare and endangered species like *Papilio krishna* (Papilionidae), a IUCN red listed species has been reported at an elevation of 2120m of this mountain forest. Distribution patterns of Nepalese butterflies are varied with respect to physiographic zones which include 51% in Terai and Siwalik zone, 88% in middle zone and 13% in the highland zone of the country (BPP, 1995).

The elevation wise diversity represented 41 species at 1400 m, 44 species at 1900 m, 17 species at 2400 m and 6 species at 2700 m and total is 108 species (Khanal, 2009).

Table 7: Diversity, Distribution, and Status of Butterfly species at Shivapuri Forest

Elevation (m)	Total number of species	No. of rare species / Uncommon species
1400	20	11 / 3
1400	21	10 / 2
1900	20	12 / 3
1900	24	9 / 2
2400	17	3 / 3
2700	6	2/ 0

Source: Khanal, 2009

As pollinators, butterflies are extremely important to people, biodiversity, and their ecosystems. Habitat specialist butterflies and moths can disappear rapidly if the environment they rely on changes. Habitat loss is the main cause of the decline of butterflies and moths. Land management techniques such as the intensification of farming and forestry, roads and climate change all have an impact.

No detail information is available on butterflies of Nagarjun forest though other insects like beetles (Coleoptera) and bugs (Hemiptera) have been little explored in this forest. Sundarijal is more explored for beetles and bugs and little information on insects of Kakani is available.

Relict Himalayan Dragonfly *(Epiophlebia laidlawi)* is a rare dragonfly belonging to the family Epiophlebiidae and order Odonata. The Epiophlebiidae is the only existing family in the suborder Anisozygoptera, which holds just two species. They are relict species of a once widespread group. One species, *Epiophlebia laidlawi* has been reported in Shivapuri forest of SNNP.

Status of Pisces

Field surveys were undertaken in December 2012 at the Dhap and in January at the Nagmati Dam site to establish the presence of fish. Fish survey sampling sites at the Dhap site, Nagmati Dam site and at the confluence of the Nagmati and Bagmati rivers. The field survey at the Dhap in the impoundment and in the river downstream identified only one species which is very common and found in almost every natural water body in Nepal, the Creek Loach (*Schistura beavani*). This is a fish of minor interest and is mentioned under 'Least Concern' in the IUCN list. The fish survey at the Nagmati Dam site showed a poor fish assemblage as well. One single species, Snow Trout (*Schizothorax richardsonii*) was found in a very low number. The fish survey study concludes that the low numbers and existence of only 2 fish species are more due to natural causes than disturbance. This is due to the physiography, low connectivity and high elevations upstream of proposed dam site, at Nagmati (BRBIP, 2012).

Status of Herpetofauna

The SNNP and BZ have excellent habitats for common to rare and endangered species of herpetofauna. It represents highly diversified faunal elements of sub-tropical to temperate zone characteristics. Although no detail surveys of the park's herpetofauna has been carried out so far, however an overview of the available literature, interviews and interactions with local communities during field visit has revealed that

in terms of faunal richness the area is second to none of the any protected area of the country. Because of its proximal vicinity with the capital city Kathmandu importance of its faunal value is remarkable.

Table 8: List of the species of herpetofauna recorded from SNNP.

S.N.	Species	Common Name	IUCN	CITES
1.	*Hoplobatrachus tigerinus*	Indian Bullfrog		II
2.	*Ptyas mucosus*	Rat Snake		II
3.	*Naja naja*	Common Cobra		II
4.	*Naja kaouthia*	Monocled Cobra		
5.	*Ophiophagus Hannah*	King Cobra		II

Legends: II = CITES Appendix

Amphibians

Occurrence of nine species of amphibians (Annex III) were confirmed from the area based on various sources. However, a detail survey of the area will definitely reveal presence of more species due to its vastness and high habitat diversity. One species of frog, Indian bull frog, *Hoplobatrachus tigerinus* recorded from the area is included in Appendix II of the CITES.

Like some other parts of the country frogs of Paa, and *Chaparana spp.* are collectively known as Paha and eaten as delicacy as well as used as medicine by some local people. The over-exploitation of some frog species for food and medicine purpose may endanger the survival of the species in the area (DNPWC, 2011).

Reptiles

Lizards

Based on literature (Pokharel et al., 2011; Shah and Tiwari, 2004), interviews and direct observation six species (Annex III) of lizard are recorded from the area, however a detail survey on this group will reveal presence of more species in the area. among the recorded lizard Bengal monitor, *Varanus bengalensis* is included in the CITES Appendix- I.

Snakes

Based on interviews, literature and direct observation 14 species (Annex III) of snake are recorded from the area; however, a detail survey will reveal presence of more species in the area. Out of 14 species five species are poisonous including three deadly poisonous species of cobra. Among the recorded species king cobra and common cobra bear special account for the area and hence worth to mention here.

The king cobra is largest poisonous species of snake not only in Nepal but throughout the world (Shah and Tiwari, 2004). The species is recorded from the core area, as well as Buffer Zones and agriculture land close to the BZ of the park

(Shah, 2016). The common cobra is also recorded from the core area and BZ of the park. Among the recorded snakes four species are listed in Appendix- II. Three species of snake recorded from the area are listed in Appendix I (one species) and II (two species) and one species is included as vulnerable in IUCN Red Data Book.

Status of Avian fauna

The park has 320 species of birds including 117 migratory birds. Among the total species of birds recorded in the park, 120 are wetland dependent, 80 are winter migrants, 6 are summer migrants, 28 are residential and 6 are vagrant. 22 globally threatened species like endangered Slender-billed Vulture, White-rumped Vulture and Red-headed Vulture. Other common bird species are white backed vulture, Himalayan griffon (Nepali & Suwal, 2007), dark kite, hen harrier, goshawk, sparrow hawk, sikhra, common buzzard, Asian black eagle, steppe eagle (BPP, 1995), magpies, kalij pheasant, leaf birds, flycatcher, bushchat, babblers, cuckoos, bulbul, swift, warblers. Importantly, the Spiny babler (*Turdoides nipalensis*), Wren babbler (*Pnoepyga pusilla*) are the endemic birds found in Shivapuri Nagarjun National Park.

Out of 320 species of birds found in the park, conservation action plan should be initiated for at least 14 threatened species, i.e. Spiny Babbler (*Turdoides nepalensis*), Oriental Hobby (*Falco severus*) Grey-sided Laughing Thrush (*Garrulax caerulatus*), Cinerous vulture (*Aegypius monachus*) and other site-specific bird in SNNP. A yearly or (once in Two Year Time) monitoring of migratory birds would be an asset in studying climate change, habitat change and or other related factors in relation to bird migration (BCN, 2011).

Status of Mammals

The area harbors fairly common to endangered species of mammal. They are distributed throughout the area from 1300m to as high as 2700m in the temperate forest. Presence of 30 species (Annex I) is confirmed through direct observation, indirect observation, interviews and literature review (Baral and Shah, 2008; Shrestha and Basnet, 2005). Among 30 species of mammals recorded from the area, four species are listed in protected list of Nepal government's National Parks and Wildlife Conservation Act 1973 (2029 BS), eight are listed in IUCN Red Data Book and 12 are included in the CITES Appendices (eight in Appendix-1 and four Appendix-II). A brief account of a few mammal species recorded from the area is provided as follows:

Table 9: List of the major mammal species recorded from the SNNP.

S. No.	Scientific Name	Common Name	National Parks and Wildlife Conservation Act, 1973	IUCN	CITES
1.	*Rusa unicolor*	Sambar Deer		V	
2.	*Capricornis thar*	Himalayan Serow		NT	I
3.	*Naemorhedus goral*	Himalayan Goral		NT	I
4.	*Panthera pardus*	Leopard			I
5.	*Neofelis nebulosa*	Clouded Leopard	P	V	I
6.	*Felis chaus*	Jungle Cat			II
7.	*Prionailurus bengalensis*	Leopard Cat	P		II
8.	*Ursus thibetanus*	Himalayan Black Bear		V	I
9.	*Macaca assamensis*	Assam Macaque	P	NT	II
10.	*Macaca mulatta*	Rhesus Macaque			II
11.	*Semnopithecus schistaceus*	Nepal Grey Langur			I
12.	*Lutra lutra*	Eurasian Otter		V	I
13.	*Manis pentadactyla*	Chinese Pangolin	P	E	I

Legends: P = Protected, E= Endangered, V = Vulnerable, NT= Nearly Threatened, I, II, = CITES Appendices (Source: Baral & Shah, 2008)

Threats

Illegal Hunting

Poaching of wildlife is another issue of great concern especially within the BZ areas. Barking deer, wild boar, porcupine, and kalij pheasants are easily targeted when they visit the crop fields. Respondents from most of the villages claimed that hunting occurs everywhere, however it takes place as a retaliation against crop damage or to control further loss of the crops. But primary purpose of illegal hunting seems to be to procure meat, skin, economic gain, livestock and crop protection are secondary purposes. Mostly indigenous traps are used to kill the wildlife.

Habitat degradation

The major problem confronted by wildlife in the area is degradation of their habitats by humans through several anthropogenic activities. Deliberate as well as accidental forest fire is serious problem of great concern in the area. Local villagers enter the core area for exploitation of the natural resources and other purposes. These activities not only disturb the wildlife but may drive them away to areas of sub-optimal habitat.

Livestock grazing has tremendous negative impacts on the wildlife because they not only compete with herbivore wildlife for food, interfere in their normal biological activities but also sharing of common habitats may spread some contagions livestock diseases to them.

CHAPTER 3

Past and Present Management Practices

3.1 Conservation History

This park initially established as Shivapuri Watershed Conservation Area in 1976 declared as SNP in 2002 and SNNP in 2009. SNNP is one of the Important Bird and Biodiversity Area (IBA) declared in 2005. Likewise, government of Nepal declared the Buffer Zone of SNNP in 2016.

Table 10: Historical summary of SNNP

Year	Significant Events
1950 to 1976	Heavy Deforestation and Encroachment in the Holy Rivers Bagmati and Bishnumati's Watershed Areas
1976 AD	Shivapuri Watershed Conservation Area Project established by the designation of Shivapuri Watershed Conservation Area and Shivapuri Watershed Development Board under the Development Board Act 1956. The Board was under the chairmanship of Secretary of the Ministry of Forests and Soil Conservation
1978 AD	Shivapuri Protected Watershed Area. The Board came under the chairmanship of a member of the Royal family
1983 AD	Initially Shivapuri Area demarcated by Gazette notification under the Shivapuri Watershed Conservation Area, and later declared as Wildlife Reserve under the NPWC Act 1973
1984 AD	Shivapuri Watershed and Wildlife Reserve Development Board was established under the Development Board Act 1956 to replace the 1976 designation
1985 AD	Shivapuri Watershed Management and Fuel Wood Plantation Project (1985-1992) with the support of FAO (Phase1) was initiated
1992 AD	Shivapuri Integrated Watershed Development Project with support of FAO, Phase II (1992-1997) was initiated
1995 AD	Shivapuri Management Plan was prepared and technically approved by FAO and Project Steering Committee
1997 AD	Completion of FAO Project Phase II. (1997-1999 extension of the project)
1999 AD	From the decision of Council of Minister, the chairmanship of the existing board was brought under the Chief of Shivapuri project
2002 AD	Change of protected area status from Shivapuri Watershed and Wildlife Reserve to Shivapuri National Park
2003 AD	GoN brought a policy to give some protected areas including Shivapuri National Park to non-governmental organizations for management
2004 AD	Preparation of Shivapuri National Park Management Plan by the then KMTNC (but it was not approved by the government)
2005 AD	Important Bird and Biodiversity Area (IBA)
2009 AD	Nagarjun forest patch included and named as Shivapuri Nagarjun National Park

Year	Significant Events
2012 AD	Preparation of Shivapuri Nagarjun National Park Management Plan (but it was not approved by the government)
2016 AD	Buffer Zone Declaration, 2072 BS
2017 AD	Buffer Zone Management Guidelines, 2073 BS

3.2 National Park Protection

Protection Unit

Nepal Army bears the responsibility of protecting the Park. For the protection of Shivapuri area the chief of the protection unit is stationed at Lipikot Barrack, Budhanilkantha, Kathmandu. Besides, the headquarters of the protection unit, there were 20 army posts all over the park (Shivapuri only) before insurgency and later they were limited to 9 posts during insurgency. Now, there are 12 and 8 army protection units in Shivapuri and Nagarjun respectively including Head quarter. For the protection of Nagarjun area, chief of the protection unit is stationed at Nagarjun Barrack, Fulbari Gate, Nagarjun. It is necessary to revive all the posts as they were before for the effective conservation. There is a good coordination between the park administration and protection units in conservation and protection of the Park.

Illegal felling, forest fire, grazing, illegal collection of forest products, poaching of endangered and other wildlife species for illegal trade of their body parts has been a major challenge for park management. To curb these illegal activities more effectively and efficiently, the national park is divided into three sectors and the area of responsibility assigned therewith. Three sector level offices are operational in Nagarjun, Sundarijal and Dhakalchaur. The anti-poaching operations operated by the park along with the army have always been crucial to control illegal activities. Besides these, formation of Community based Anti-Poaching Operation (CBAPO) groups has been important in intelligence gathering and public awareness against forest and wildlife crimes. The national park's sectors, posts and entry points has been allocated accoding to Annex XII for the better vigilace in the area of responsibility. At present, the mobilization of army is not limited to the core area of the park. Existing Standing Operation Procedures (SOP) provides right and duty to army to launch park protection activities in buffer zone as well. There are altogether 39 posts /units (20 of Nepal army and 19 of national park) located in national park to ensure protection of park resources, wild animals and their habitat. Out of these posts, nine are with army unit only, three are with national park staff only and the 11 have both units. The list of the different security posts in the park area is in Annex XII. Staffs/Army deployed in these posts patrol their respective areas regularly to ensure that there are no illegal activities in the core area and buffer zone of the park. Patrolling is done mostly either on foot or by using vehicle depending upon situation. In addition to regular patrolling efforts, real time patrolling, sweeping and camping operation is also adopted in sensitive areas. Night patrolling has also been in practice in the park and buffer zone as per need.

3.3 Habitat Management

In order to maintain mosaic of suitable habitat in the park, management of forest, grasslands and wetlands has been in practice as habitat management intervention. Regular grassland management has been carried out by cutting, uprooting of weeds and burning.

Rivers, streams, water sources are polluted by garbage, pesticides and chemical fertilizers used in agricultural fields in the buffer zone. Most serious problem is the pressure for construction of intake dams in the streams inside the park for the collection of water for drinking and other commercial purposes. Nagarjun is comparatively drier than the other parts of the park.

3.4 Anti-poaching and Intelligence Gathering

The park has a network of informant for intelligence gathering. The park has created an anti-poaching unit under *mudda saakhaa* (prosecution section). Apart from building effective intelligence network to monitor and prevent illegal activities, this unit raids and seizes illegal wildlife products. Real Time Patrolling is particularly active in monitoring of patrolling and other operations conducted by the security staffs. A comprehensive protection strategy has been brought about and appreciable reduction in illegal activities is expected to be achieved with the implementation of this strategy. Besides these, the regular coordination meeting conduct monthly has been providing significant support in anti-poaching.

In order to make anti-poaching operations more effective, district level Wildlife Crime Control Bureau (WCCB) has been formed in Kathmandu Valley of three districts. The bureau of Kathmandu Valley is respectively coordinated by the District Forest Officer of Kathmandu District Forest Office. The bureau comprises of the officer representatives from District Administrative Office, Metropolitan Police Office, Armed Police Force, National Investigation Department, District Attorney General Office, Shivapuri Nagarjun National Park Office, District Forest Office, Lalitpur, District Forest Office, Bhaktapur, two battalions of SNNP and other relevant government offices as well.

3.5 Tourism and Interpretation

SNNP due to its scenic attraction and varied biodiversity is a promising site for ecotourism development. There is a long history of tourism development in Shivapuri area. Historically Dr. Francis Hamilton was the first who conducted botanical survey in 1920 at Shivapuri hill and Dr. Hudson, Ambassador of UK, collected and studied birds. The main attraction of the park is scenic view, biodiversity, forest environment, wilderness, avifauna, spiritual fitness, religious site, trekking, hiking and soft adventure. Besides, the park has high potential to promote an ecotourism center, which may generate financial resources, needed for Park management and income generating opportunities to the locals. Currently, domestic tourism is developed in the periphery of the important religious sites like Baghdhowar, Bishnudwar, Shivapuri peak, Nagiguma, Sundarijal, Jamacho etc. and the scenic-spots like Kakani and Chisapani.

Since the park is the source of drinking water to Kathmandu, concessionaires have been avoided inside the Park. However, there are few lodges in Mulkharka village located within the park boundary. The park is popular for hiking and cycling. However, these activities have certain impacts particularly on drinking water since the forest roads are not properly located and managed.

The Kathmandu based tour/trek operators conduct regular tourism activities like a day-hike to Shivapuri Peak, viewing a snow pear panorama of other Himalaya. This has become the most popular activity, followed by bird watching, Jungle walk and cycling the surroundings; endemic tours like watching butterfly, dragonflies, as well as transition to the long trek packaged to Helambu and Lamtang and a short trek packaged to Nagarkot from Chisapani. For Nepali visitors, educational visits, meditation and religious ceremony are the major activities. An average duration of the tourism activities is of one day. Thus, SNNP deserves immense tourism potential.

Tourism Infrastructure:

SNNP is linked by some major road-networks from the valley: Sundarijal, Budhanilkantha, Tokha, Kakani and Nagarjun. Inside the Park, there is 95 km long forest road, 83 km foot trails in Shivapuri and 33 km long forest road and 10 km foot trails in Nagarjun, constructed for trekking and village walks. The park, thus, has significantly improved the road network and trails making it easily accessible.

Visitor Inflow:

The visitor records of SNNP show that the park has been visited by an average of 1,67,500 visitors annually during the last five years. The total number of tourist visited in the park has been reached from 10850 in FY 2051/52 to 209717 by the FY 2073/74 (SNNP 2017). Total number of foreign visitors visiting SNNP was 16539 during FY 2073/74, of which 1444 foreign visitors visited during shrawan and bhadra. up to 3823 during Chait/Baishakh of 2073/2074. Foreign tourist visit this park in two main seasons in september/ october and april/ may, like the general pattern of tourist flow in Nepal.

Baishakh (April/May) is the month of festival *(mela)* in Baghdwar, Bishnudwar, Manichud, Kageshwori, Sundarimai, Pachali bhairab and Jamacho. During the religious fetes, a significant number of devotees visit the religious sites from different routes

3.6 Research and Monitoring

SNNP is one of the best studied protected areas in this region. The ecology of the common leopard was studied by research institute and more recently by park office. Other mammals studied include Monkey, Himalayan Black Bear, Goral and others. The avifauna is well documented, with research including surveys of wetland species. Scientist from Natural History Museum has studied the butterflies and moths. There are few ongoing research studies on various aspects of park management, human wildlife conflict and insects. Individual researcher and universities are involved in these research

activities. However, the park is among the best studied parks, the linkage between research and management is still poor. Apart from these, a number of research activities have been conducted by national and international universities, institutions, organizations and persons basically on fauna like leopard, Assamese monkey, insects, avifauna, etc. Some of these researches have been found important for decision making and implementation of suitable activities. The researches on status, habitat, ecology and conflict are other topics of researches conducted to date.

3.7 Human-Wildlife Conflict

The protection of the park has resulted in increase in the status of wildlife population. In recent years, human-wildlife conflict is becoming one of the major hindering factors for maintaining harmonious relationships with local people and increase people's participation in conservation. The park has set and implemented several attempts to minimize the conflict. Human casualty, livestock depredation and crop raiding are major causes of conflict.

SNNP is adopting the strategy of human-wildlife co-existence rather than conflict. Relief scheme and buffer zone programme is being launched and systematized. In order to assist victims for their damage and provide quick treatment, relief scheme has been formulated and support is provided under quick response mechanism. Long-term solutions are required to minimize the level of conflict. Support for crop composition change, construction of permanent and safe structures would be the remedial solutions. Similarly, 25% of the total budget of BZ has been assured through the provision in SNNP-BZ Management Guideline, 2073 B.S. for human wildlife conflict compensation and relief.

Table 11: The information of the damage causing wildlife in the national park area.

Name of the species	Pest on Agriculture	Pest on livestock	Used as food	Used in medicine	Cultural importance
Assamese monkey	√				
Rhesus monkey	√				
Langur	√				
Golden jackal	√	√		√	
Himalayan black bear	√			√	
Yellow-throated marten	√	√			
Leopard		√		√	√
Clouded leopard		√		√	
Barking deer	√		√	√	
Goral antelope			√		

Name of the species	Pest on Agriculture	Pest on livestock	Used as food	Used in medicine	Cultural importance
Himalayan serow			√		
Red flying squirrel	√			√	√
Masked palm civet	√			√	
Large Indian civet	√				
Porcupine	√		√	√	√
Birds (kalij pheasants)	√		√		
Frogs			√	√	

3.7.1 Crop raiding and livestock depredation by wildlife

Invasion of wildlife in the surrounding area has tremendously increased after the designation of Shivapuri as a protected area resulting high crop damage and livestock depredation. Invasion of wild animals is triggered mainly due to the increasing wildlife population [mainly of Wild Boar, Monkey, Porcupine and Barking deer (Bajracharya, 2009)]. Eight types of wild pests were identified in SNNP (Purkait, 2008). Wild boar, Monkey, Porcupine, Rat, and birds were crop raiders while Leopard, Jungle cat and Black kite were livestock depredators.

The most destructive wild animal in terms of crop damage appears to be wild boar, preferably damage maize, millet and most of the tuber family plants such as yam, potato etc. However, birds, monkeys and porcupine are also reported as serious pests to crop. Total economic loss due to crop depredation by Porcupine itself was Rs. 1,91,639.06 per annum (Purkai, 2008) and Rs. 3,906.87 to Rs. 4,077.43 (Kaway, 2010) per household. The problem has become so severe that the farmers have to abandon many hectares of cultivable land. It was also estimated that the total loss of crops per annum is 16,234 kg, and the collapsing of the existing stone wall at several places. HMG/N 1996 has reported lack of adequate resources and legal basis for relief support resulted in abandonment of about 431 ha of agricultural land along the bordering settlements of the park.

In addition to crop raiding, some isolated cases of livestock depredation by wild animals are also reported. Due to the excessive pressure on their habitat, there may be some possibilities that the wild animals may harm to human beings as well.

3.8 Administration and Organization

The park management is well structured with technical, administrator, finance and BZ support units according to revised SNNP Organization and management structure. The Chief Conservation Officer (Gazetted II Class Officer) is the chief of the park administration, accompanied by five Assistant Conservation Officers (Gazetted III Class Officers) and other staff. Two Nepal Army battalions deployed for the park and park resources protection.

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

3.9.1 Strengths

- Watershed conservation and management of Holy Rivers Bagmati and Bishnumati
- Drinking water, irrigation, recharge of ground water sources to Kathmandu valley
- Carbon sequestration of Kathmandu valley, it is the lifeline of Kathmandu
- Biodiversity hotspot of mid-mountain
- Renowned nearby destination for nature hiking, bird watching, mediation and nature-based tourism from the capital city of Nepal
- Substantial revenue from tourism which has been ploughed back for conservation and socio-economic development through buffer zone;
- Encouraging partnership with local communities and stakeholders, including national and global conservation organizations in future.
- Two battalions with numbers of security posts for park protection and adequate number of park staff for the conservation and management.

3.9.2 Weakness

- No maintenance of boundary wall
- Inadequate reconstruction of infrastructure after earthquake.
- Inadequate budget and resources
- Inadequate research on impact of climate change and problematic animals
- Not effective communication and transportation system
- Unsystematic water resources management
- Lack of fire management plan
- No separate regulation of SNNP

3.9.3 Opportunities

- Improving vegetation cover in watershed area for better supply of quality and quantity of drinking water.
- Participation of buffer zone communities in biodiversity conservation
- Increasing population of key wildlife species such as common leopard
- Diversifying eco-tourism through involvement of local people
- Research opportunities through collaboration with academic and conservation partners
- Potential for self-sufficiency in financial resources required for conservation from ecotourism, water utilization and implementing Payment for Environment services (PES)
- Potential to serve as role model in protected area management for similar type of habitats (Learning centre, centre of excellence, state of the art, etc.)

3.9.4 Threats

- Poaching to be a threat as long as traditional use and market value for illegal wildlife parts exists;
- Grassland degradation from natural succession;
- Concentrated tourism; Site-specific tourism;

- Local people's heavy dependency on park for forest resource;
- Increasing human-wildlife conflict;
- Uncertain adverse impact of climate change on biodiversity
- Garbage pollution in wetland habitat including rivers.
- Four villages (Mulkharka, Okhreni, Chilaune and Kunegau) are inside the park
- Risk of seasonal forest fire in pine forests particularly in dry areas.
- Exploitation of water resources
- Inadequate budget for the management and conservation of the park
- Delay in reconstruction of national park and security posts
- Encroachment in park and BZ.
- Haphazard development activities especially road network in the park and BZ
- Rapidly changing land use pattern in the park and BZ.
- Management of river based forest products in the BZ.

Part B
The Proposed Management

CHAPTER 4

Vision, Goal and Objectives

4.1 Vision Statement

Well conserved biodiversity and watersheds in the Park and BZ for the wellbeing of local and national communities.

4.2 Management Goal

Conserve and maintain biodiversity and natural ecosystems, improve watershed and wetlands, enhance socio-economic and cultural values of SNNP and its BZ.

4.3 Management Objectives

To protect and conserve biodiversity, watershed, wetlands and conserve natural and cultural heritage through capacity building, research, community participation and community development to achieve sustainable management of SNNP and BZ. Specific objectives are:

I. To protect, conserve and document biodiversity with special focus on nationally protected, globally threatened and locally valuable, endangered and endemic species, critical ecosystems, and diverse wildlife habitats;

II. To manage the representative terrestrial and aquatic wildlife habitats and assess periodically habitat to maintain ecological functions and processes of mid-mountain ecosystem;

III. To manage watershed of Holy Rivers such as Bagmati and Bishnumati to improve water quality, hydrological functions and processes in perpetuity;

IV. To regulate and promote sustainable eco-tourism retaining wilderness within the least acceptable change on natural environment and socio-cultural heritage of SNNP and buffer zone;

V. To enhance public participation in biodiversity conservation by raising awareness, and improving livelihoods and minimizing human-wildlife conflicts by initiating effective measures in collaboration with local communities and local level government agencies;

VI. To strengthen institutional capacity of both park, security and buffer zone through research, capacity building in collaboration with relevant agencies and organizations;

4.5 Major challenges in achieving Objectives

There are several challenges in achieving desired condition of the park. The challenges for controlling some of the problems that may hinder to attain the set objectives are:

Objective 1

To protect, conserve and document biodiversity with special focus on nationally protected, globally threatened and locally valuable, endangered and endemic species, critical ecosystems, and diverse wildlife habitats:

- Illegal felling of trees
- Poaching of wildlife
- Inadequate infrastructure and limited budget for its maintenance
- Insufficient budget for park management
- Little linkages between research and management need
- Limited mobility inside the park during monsoon

Objective 2

To manage the representative terrestrial and aquatic wildlife habitats and assess periodically habitat to maintain ecological functions and processes of mid-mountain ecosystem:

- Encroachment
- Over use of water resources
- Accidental forest fire
- Habitat Fragmentation due to road networks and other infrastructures development.
- Conversion of grassland into forest land
- Pollution in wetlands

Objective 3

To manage watershed of Holy River such as Bagmati and Bishnumati to improve water quality, hydrological functions and processes in perpetuity:

- Existence of four villages (Mulkharka, Okhreni, Chilaune and Kunegau) in the watershed of Bagmati river
- Illegal felling of trees and collection of forest products
- Haphazard infrastructure development especially road network in the watershed of Bagmati river
- Traditional resource dependency of the people living in the buffer zone of the park
- Pollution in rivers and scattered garbage in the park and BZ from visitors
- Use of chemical fertilizers and pesticides in the agricultural land of Bagmati watershed area
- Low level of awareness and poverty of the people living in the watershed
- Over harvesting of water resources
- Inadequate research, monitoring and baseline data on hydrological functions; and watershed

Objective 4

To regulate and promote sustainable eco-tourism retaining wilderness within the least acceptable change on natural environment and socio-cultural heritage of SNNP and buffer zone:

- Concentrated tourism activities in the park
- Inadequate exploration of tourism opportunities in buffer zone
- Poor tourism infrastructure development
- Disturbance to wildlife and habitat from concentrated tourism
- Lack of separate unit and dedicated staff to look after tourism management (services and facilities)
- Lack of tourist information centres
- Ineffective measures to manage crowd and garbage
- Inadequate tourism services and facilities
- Inadequate coordination among the relevant agencies and stakeholders

Objective 5

To enhance public participation in biodiversity conservation by raising awareness, improving livelihoods and minimizing human-wildlife conflicts by initiating effective measures in collaboration with local communities and local level government agencies:

- Inadequate conservation awareness programme in BZ
- Human casualties, crop damage and livestock depredation by wild animals straying out from the park
- Inadequate income generation, employment and livelihood opportunities for the local people
- Limited revenue generated by the park office and inadequate budget for conservation, mitigating human wildlife conflict, community development, conservation education, ecotourism development, income generation and skill development activities in the buffer zone
- Forest fire, grazing and high dependency of people on the park resources
- Four villages inside the park and large number of people residing in the buffer zone; and
- Ineffective relief and rehabilitation delivery mechanism and inadequate relief amount

Objective 6

To strengthen institutional capacity of park, security and buffer zone through research, capacity building in collaboration with relevant agencies and organizations.

- In adequate research activities and research priority not identified
- Inadequate implication of research on management
- Limited budget for ecological monitoring and research
- Inadequate management-oriented research and adaptive management
- Inadequate plan and fund for training and exposure visit
- Inadequate budget and staffs for community mobilization; and
- Insufficient incentives, rewards, amenities and welfare for park, army staff for their motivation

CHAPTER 5

Management Strategies

1.1. Boundaries

1.1.1. Legal

Shivapuri Nagarjun National Park and its buffer zone were declared according to the provision made in the National Parks and Wildlife Conservation Act, 1973. The boundary of this National Park and buffer zone is well defined and duly notified with the publication in Nepal Gazette. The area of park is well demarcated on ground with natural features such as rivers, ridges and other land use. The land in periphery comprises the buffer zone and there is no ambiguity and dispute on boundaries of national park and buffer zone at present.

1.1.2. Administrative

The core area and buffer zone of SNNP falls under four districts of Nepal, viz. Kathmandu, Nuwakot, Sindhupalchowk and Dhading Districts.

1.1.3. Ecological

This has been dealt in 2.1.2. in chapter II.

1.1.4. Sectorial Division

The park is divided into 3 sectors for management. These sectors are Sundarijal, Dhakalchaur, and Nagarjun. Each sector has its own area of responsibility.

Zonation

Since the park is designated to ensure the management of watershed of Bagmati, Bishunumati, Trishuli and Indrawati rivers. It also designated to ensure the better quality and quantity of water resources for Kathmandu valley. Further more to ensure the viable population of wildlife, viz. common leopard, clouded leopard, himalayan black bear, pangolin, leopard cat, barking deer, assamese monkey, spiny babbler, king cobra, etc., the heart and soul of this plan lies in watershed management and maintaining the present wildlife population of the park through stringent protection and appropriate management measures. In order to reduce conflict and maximize the efforts to protect, maintain and enhance the wildlife habitat, the following zones are proposed:

1.2 Management Facility Zone

This is the zone inside the park occupied by the infrastructures developed for office and accommodation for park staff and army personnel. It comprises of the area occupied by the security posts (Army and

National Park) established and operated in SNNP. The area of management facility zone is 0.42sq.km (approx.). (Assuming the area covered by a post on average is 100m radius).

Zone uses by others

Some other organizations occupied some land area viz, Nepal Army staff college, Nepal Army Alle barrack, Nepal Scout training centre, former king Palace in Nagarjun, water collection reservoirs, intake and some religious sites. Nagigumba is surrounded by the park.

5.2.1 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 9 entry points for the visitors to access the park (Map 6). There are three rights of ways (Balaju to Mudkhu, Tokha to chhahare via gurje bhanjyang and Bangesalla to Dandaganu). The forest road length is 128 km and 90 Km foot trail falls in utility zone in the entire park. There are few tourism infrastructures developed inside the park, a few view towers. The main objective managing this zone is to regulate tourism in the core area to minimize the disturbance to wildlife and its habitat, minimum impact on water resources and to enhance visitors' satisfaction, (birding, cycling, recreational, cultural) through providing wilderness experience. The area under utility zone is 0.725 sq.km (assuming the width of road as 6.5m, including road track, side drainage and narrow buffer strip).

5.2.2 Core Zone

The area of the national park except the area allocated for management facilities, tourism routes and public right of ways, falls under this zone. The basic objective of this zone is to manage water resources, watershed and maintain suitable habitat for wildlife and to encourage research and science-based management intervention.

Table 12: Management Zones

S.N.	Name of the zone	Area(Sq km)	Remarks
1	Management Facility Zone	0.42 km^2	Area occupied by the limited infrastructure developed for the management of park
2	Uses of park area for other purposes	0.32 km^2	Area occupied by other organizations
3	Utility Zone	0.72 km^2	Sundarijal, Panimuhan to Baghdwor area and Fulbari to Jamacho for regulated fire line, tourism and public right of way
4	Core Zone	157.54 km^2	Area of the national park except the area allocated for management facilities, tourism routes and public right of way

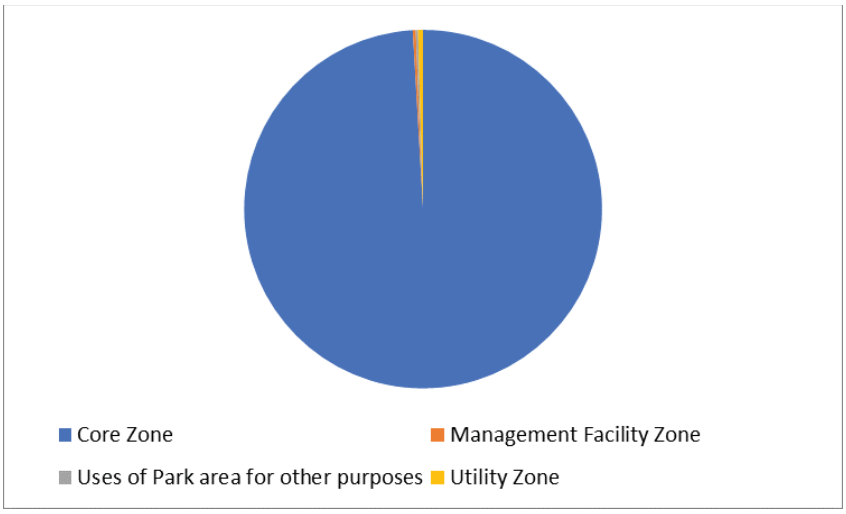


Figure 8 : SNNP Management Zones

5.3 Theme Plans

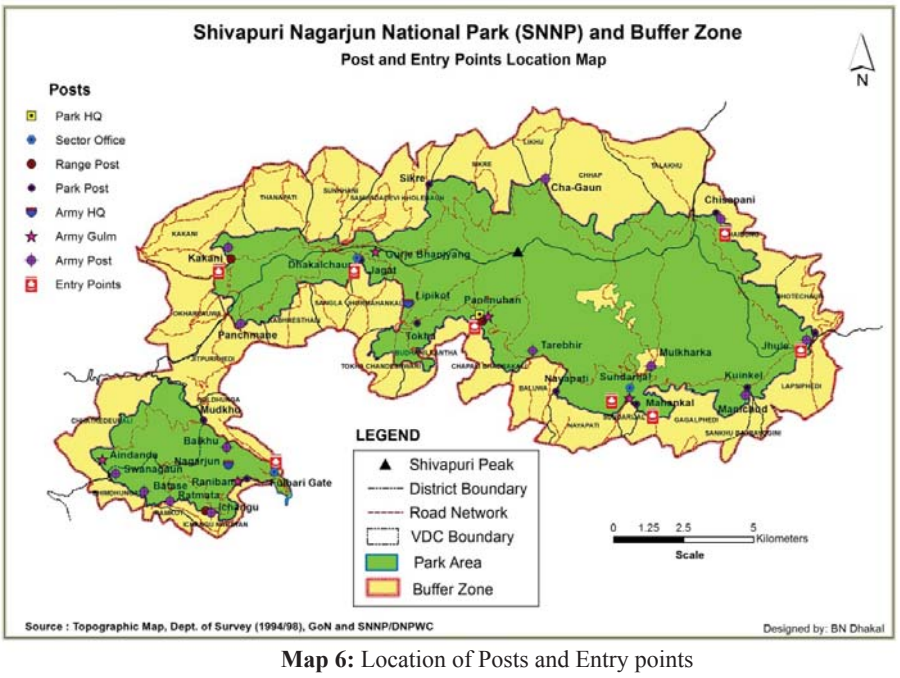
5.3.1 Protection and Conservation of Biodiversity

Of the five broad thematic areas, two thematic areas, *viz.* protection and conservation of biodiversity, and habitat management are covered in this chapter. The remaining three are dealt in separate chapters.

5.3.1.1 Park Protection

Context and Issues

SNNP has witnessed several management modality in its history of four decades in park protection. The concept of protection was started with watershed conservation area in 1970s whereas the Government has deployed Nepal Army for wildlife reserve in 1983. There are 31 park posts and security posts (National Park, Army and combined) at present located in core and buffer zone of the



Map 6: Location of Posts and Entry points

park (Map 6). Positive correlation has been observed between the number of park security posts and park, water sources and watershed protection.

On the other side, there is a negative correlation between the number of security posts and number of illegal forest products collection. Due to insurgency, security posts decreased and limited in 8 posts altogether. Thus, the park security is regarded as a pre-requisite for the successful management of SNNP taking common leopard population as an indicator. Therefore, the heart and soul of this management plan lies 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 and transportation facilities and highly dedicated army personnel and park staff for regular patrolling of the park. This theme covers general protection of wildlife and its habitat that includes control of illegal activities like poaching, encroachment, grazing and collection of forest products and safeguarding watershed, water resources and biodiversity.

Strategy

- prepare a patrolling plan, root and map
- identify the poaching prone area
- to conduct training and exposure to the front-line staff of army and park
- To strengthen the informants networks in and around the NP
- To establish CBAPO's among the youth in the BZ

Activities

- Establish new security posts in strategic area of the park,
- Strengthen the capacity of security personnels

5.3.2 Habitat Management

5.3.2.1 Grassland Management

Context and Issues

Grassland has a fundamental role to play in wildlife conservation as it is a good foraging ground for prey base. Grasslands are being converted into woodland resulting in the decrease of grassland area in recent years. There are few studies conducted on grassland ecology. Limited management intervention and maintenance of pure grassland patches in the park has been a challenge. Some of the issues associated with the grasslands of SNNP are to maintain the structural and functional attribute of the grassland so as to provide optimal foraging opportunities to the prey, invasion of grassland by weeds and unpalatable species and the impact from uncontrolled burning. Lack of record of grasslands and their characteristics and invasion of grasslands by trees and weeds are the major issues in the grassland management. Assessments made so far have shown that area infested by *lantana camera* is not suitable habitat for herbivores.

A diversity of native plants, shrubs, and trees provide food, cover, and nesting sites. Opening should be created in areas where ungulate is present. Grassland birds also need open patches. Such opening needs to be near any permanent waterhole.

Grassland supports several species of insects for their shelter, food and to complete their life history. Different species of grasses and herbaceous plants are sources of food for most of the species of small blues butterflies (Lycaenids) and some Skippers (Hespriids). These are good indicators of different species of grasses as their larval food grasses vary species wise. Any kind of impact on grassland may lead to disappear these butterflies and many other insect species. Grassland dependent species of butterflies of SNNP recorded in previous study (Khanal, 2013).

Strategies and Activities

It is evident that many types of grasslands in SNNP is either converted into woodlands or invaded by non-palatable weeds. The patch of grassland fully converted into woodland or fully invaded with weed and unpalatable grasses like *Lantana, Eupatorium and others* are the first priority for management intervention.

Survey and Mapping

Strategies

- Survey, classification and mapping of grasslands based on the use and potential for herbivores, birds and butterflies.
- Mapping encroachment zone from invasive and woody perennial species

Activities

- Maintain grassland 100 ha. area in the next five years.
- Inventory and monitor grassland and species.
- Revise and update the ecosystem types in the park and BZ
- Prepare and implement habitat management action plan (e.g. grassland, forest and wetland)
- Conduct assessment of alien and invasive species in the park

Removal and Control of Invasive Species

Strategies

- Prevent the regeneration of Lantana and other invasive species in the whole park in next five years

Activities

- Remove and control two main problematic invasive species
- Uproot, dry and burn before their seed gets matured

Controlled Burning and Grass and tree Cutting

Strategy

- Cut and/or controlled burn to remove dry, coarse and unpalatable grasses and allow to produce new flush which are highly palatable and nutritious.

Activities

- Maintain grassland by cutting and/or controlled burning in the next five years

5.3.2.2 Wetland Management

Context and issues

Water is a basic component of wildlife habitat which is the limiting factor in many wildlife habitats during dry season. The wetlands of SNNP and BZ include Dhap water hole, Bagmati, Bishnumati rivers and their tributaries. Bagmati River Basin Integrated Programme has been constructing Dhap Dam for harvesting water during summer season. It helps to increase water flow in autumn, winter, and spring season in Holy River Bagmati. Besides, rivers are polluted by rural wastes, pesticides and chemical fertilizers used in agricultural fields. Wetland is equally significant in management of aquatic life, water bird and butterfly habitat. Such area is source of sodium for many species of butterflies. Lack of Sodium leaves impact in the fertility of butterfly species. Many butterfly species are seen sipping liquid at moist trail which is their Sodium intake.

Strategies

- Prepare inventory of wetlands and conduct assessment for water quality and quantity
- Strengthen awareness programmes
- Prepare site management plan of Dhap, Bagmati and Bishnumati Rivers

Activities

- Clean and remove garbage in wetlands (Bagmati, Bishnumati etc.)
- Assess water quality in regular intervals
- Conduct wetland conservation education, interaction, stakeholders meeting etc. regularly.
- Implement the activities prescribed in the site management plan of Dhap reservoir, Bagmati and Bishnumati rivers.

PRIORITY AREAS

At Strategic Level

I. Maintain healthy wetland ecosystem in and around Bagmati and Bishnumati rivers
II. Promote sustainable wetland based eco-tourism
III. Raise community awareness on wetland conservation
IV. Facilitate scientific research and monitoring
V. Ensure the sustainable and perpetual water source

At Site Level

VI. Take actions to control pollution of Bagmati and Bishnumati rivers
VII. Discourage forest products harvest and stop poaching

5.3.3 Fire Management

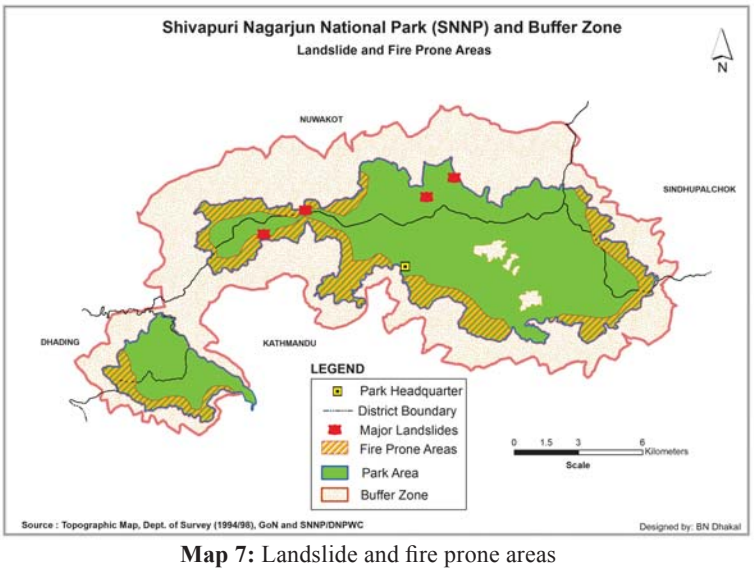
Context and Issues

Fire is a management tool for setting back succession and has been used in grassland management. However, accidental fire has many detrimental effects in protected areas as it harms watershed, water holding capacity, micro-fauna and alters habitat. The main objective of fire management in SNNP is to prevent wildfire so as to avoid the adverse effects of fire on watershed, water holding capacity, wildlife and their habitat.

Fire is a menace in SNNP. A regular Fire Monitoring Unit (such as Anti-Poaching Unit) be formed and it should be active in fire prone-season. Fire prone areas are mapped and vigilance be increased in fire prone-season. Buffer zone communities be well informed in each fire prone season, school programme must be effective in this regard. Local tourism entrepreneurs and nature guides be given special requests through media or any other means of fire hazards and its drawbacks in tourism and biodiversity.

Many insect groups decline markedly immediately after fire, with the magnitude of reduction related to the degree of exposure to the flames and mobility of the insects. Niche diversity is lower in recently burned habitat, and the rate of insect increase following fire also relates to the species' ability to gain access to the re-growing vegetation.

Forest fire in protected areas though is seldom can destroy low flying butterflies which specially depend on ground flora. The life stage of such species like egg, larva, pupa and adults are destroyed by fire. Forest fire may also affect larger butterflies which fly higher up and escape fire situation. Their eggs if laid on shrubs or ground flora are destroyed by fire including their larval and pupa stages. Species of Ground insects like beetles (Coleoptera), bugs (Hemiptera) flies (Diptera) etc are also equally impacted by forest fire.



Map 7: Landslide and fire prone areas

Forest fire and burnt of leaflitter and, surface run off will be increased and less water holding capacity. Due to forest fire increased floods in the downstream less water discharge in rivers during winter and spring season.

Strategy

- Make a fire management plan;
- Develop a network of fire line;
- Clear fire line and forest roads well before the fire season;
- Identify fire prone areas by using mapping based on satellite imagery analysis or using the web-based fire mapper and managed accordingly for prevention.

Activities

- Early collection of burning materials on the basis of burning regime and creation of firebreaks annually
- Create awareness
- Restrict to carry lighting materials inside the park
- Make waterhole in the fire prone area
- Actively participate local communities in fire control
- Form Quick Response Team (QRT) at BZUC level
- Conduct fire control training to park, army personnel and QRT team members
- Strengthen coordination among the concerning agencies.

5.3.4 Wildlife Health Management

Context and Issues

There is the likelihood of interactions between wild animal and domestic livestock sharing the same forestlands or waterholes as there are villages around the park. Since there is the risk of transferring disease from livestock to wild animals and vice versa, health monitoring and surveillance for important wild animal diseases should be done regularly.

Strategies

- Formulate a protocol for wildlife health monitoring and disease surveillance
- Coordinate with relevant veterinary institutions and expedite the veterinary hospital
- Build the capacity of existing staff to handle the upcoming situation

Activities

- Support for immunize livestock every year against endemic diseases within the radius of 2 km in buffer zone
- Develop proper arrangement for quick communication so that management action for wildlife health management could be taken on time
- Coordinate with Veterinary Offices, Central Zoo and seek their support whenever required
- Build the capacity of frontline staff to recognize, record and report disease or poor health condition of animals or plants
- Report and document mortality of the wild animals immediately after it comes to notice of any staff as part of disease surveillance strategy

5.3.5 Encroachment Management

Context and Issues

Encroachment particularly occurred in park boundary, inside the park and in BZ by local people and religious sites. The core area of SNNP and BZ forests encroached from the local people.

Strategies

- Prepare inventory of encroached land,
- Strengthen awareness programmes
- Prepare encroachment evacuation plan

Activities

- Assess encroached area at regular intervals
- Conduct interaction, stakeholders meeting etc. regularly with law enforcement agencies, local level government and BZUC
- Prepare and implement evacuation plan
- Conduct regular patrolling to control the future encroachment
- Create awareness among the people.

5.3.6 Anti-poaching and Intelligence Gathering

Context and Issues

The park has a network of informants for intelligence gathering. Apart from building effective intelligence network to monitor and prevent illegal activities, the park protection authority arrested persons, raids and seizes illegal forest products and wildlife products. So, action should be regularly made to strengthen anti-poaching and intelligence gathering.

Strategies

- Co-ordinate with Nepal Army stationed at the park and, other relevant law enforcement agencies, WCCBs, and APO network in controlling illegal activities
- Institutionalize the CBAPOs and mobilize conservation-clubs

Activities

- Strengthen Kathmandu valley Wildlife Crime Control Bureau (WCCB) and extend coordination with adjoining four district forest offices, *viz.* Kathmandu, Nuwakot, Sindhupalchowk and Dhading.
- Strengthen APU and intelligence network
- Strengthen coordination and develop effective information sharing mechanism with the Nepal Army and other related law enforcement agencies
- Strengthen and enhance Real Time Patrolling to cover all security posts throughout the park
- Initiate long-term surveillance of sensitive area and suspected persons
- Institutionalize Community based Anti-Poaching Operation(CBAPO)
- Build capacity of informants to ensure their approach of intelligence gathering is not invasive
- Regulate information purchasing mechanism
- Disseminate information of legal punishment for involvement in poaching and illegal wildlife trade
- Encourage and mobilize conservation-clubs, students, teacher's network forum and local clubs to fight against poaching and illegal activities.

CHAPTER 6

Research, Monitoring and Capacity Building

6.1 Research

Research provides the scientific basis for the management of protected area. In order to ensure effective management, there should be sufficient information on bio-physical, hydrological, ecological, eco-tourism and socio-cultural aspects of protected areas. Research and monitoring is important for every protected area as it helps to develop database and supports in decision making process. 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. SNNP is among well studied PA's in this region which has been a very good learning ground in watershed, payment for ecosystem services, human wildlife conflict, wetland and water resources, religious sites, wildlife species, and its habitat management. However, there is a need of continuous research and monitoring in order to tackle the emerging challenges in park management as the nature is dynamic. Several national and international universities, institutions and persons conduct different researches each year in this park and buffer zone, among them, Tribhuvan University, Institute of Foresty, Kathmandu University, etc. are major ones.

Research Priorities

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

The research priorities of SNNP management at present could be as follows:

- Status and behaviour of Himalayan black bear;
- Payment for ecosystem services;
- Status and Ecological behaviour of Spiny Babbler;
- Watershed conservation and management;
- Impact of forest fire on watershed, water holding capacity and biodiversity;

- Hydrological functions, wetlands and water sources management and conservation;
- Status of river ecosystem and over harvesting of water;
- Status and distribution of mammals, birds, fishes and water animals;
- Status and distribution of Herpetofauna;
- Status and distribution of Pangolins, leopard, clouded leopard;
- Status and distribution of insects;
- Pollution in water sources and rivers;
- Human wildlife conflict;
- Eco-tourism development in Park and BZ;
- Study of Carrying capacity of Carnivores;
- Study of Endemic flora and fauna;
- Vegetation dynamics and its impact on wildlife habitat;
- Population dynamics, habitat use and resource partitioning of sympatric wildlife species;
- Social organization and land tenure system in SNNP as to provide information and management recommendation regarding predator dispersal;
- Behavioral and habitat ecology of protected wildlife species;
- Ecological impact of tourism with special reference to wildlife health, behavior and reproductive success as a basis for regulating tourism in core area;
- Impact of alien and invasive species on wildlife and its habitat and experimental research to control it;
- Impact of buffer zone programme on conservation and sustainable livelihoods of local communities;
- Economic and ecological benefits of SNNP;
- Climate change indicators and impact on biodiversity conservation along with adaptation strategies;
- Least studied species and its habitat like small mammals (mouse, rat, shrew, bat; etc), herpetofauna (king cobra, toad, lizard), butterfly, insects, fish, endemic plants, threatened species of flora and fauna
- Pattern and trend of bird migration; migratory birds both general and species-wise;
- Status of small carnivores; including jungle cat, leopard cat and civets.

Research Projects

In addition to the ongoing monitoring and research activities of the park, SNNP management can collaborate with scientific and research institutions like Institute of Forestry and other national and international universities for research projects based on its priority areas. Interested organizations and individuals may undertake their research works in SNNP and BZ by taking permission from designated authority. For conducting research in SNNP and BZ, Nepalese citizens should receive permission from DNPWC. But for foreigners, the

permission is provided by MoFE. In order to strengthen research programme, the following actions are recommended:

- Establish research plots inside park; and
- Institutionalize Research Unit in SNNP to coordinate research activities and develop research and management linkages

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 prioritize the research needs
- To find the watershed condition
- To assess the water quality and quantity

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

Population Monitoring

Common Leopard and clouded Leopard Monitoring

- Regular scat based monitoring of both leopards from respective posts
- Both Leopards count at every 4 years
- Block monitoring every alternate year in high density areas
- Camera trapping in selected block every year
- Sign-based monitoring from respective posts- pugmark tracing and documentation
- Follow carnivores monitoring protocol developed by the Government of Nepal
- Develop and maintain impression pads in selected 5 locations and monitor regularly

Prey base monitoring

- Periodic monitoring using line transect method
- Regular monitoring in selected areas

Himalayan black bear monitoring

- Bear monitoring in every three years

Assamese monkey (Pahare Bandar) monitoring

- Monkey count in every two years

Pangolin monitoring

- Pangolin monitoring in every three years

Spiny babbler and other Bird monitoring

- Annual monitoring of migratory and other water birds in mid-winter
- Monitoring of endangered birds, including threatened and endemic

Habitat Monitoring

There should be established ecological monitoring grids in SNNP to monitor food, water, cover and space. The long-term water ecosystem monitoring should be continued in collaboration with research organization. For vegetation monitoring in SNNP, there is a need to establish monitoring plots.

Wildlife Health Monitoring

A wildlife orphanage and rescue centre has been established in the park headquarter at panimuhan for emergency treatment in and around park area. The recused and injured animals will be treated upon arrival at rescue centre. The mortality of wild animals will be immideately reported and document after it comes to notice of any staff. Necesssary coordination will be keept for the necessary treatment and postmortem.

Weather Monitoring

There is no meteorological station in SNNP so far. There is a need of at least one meteorological station in the park, one in Bagmati Watershed area in coordination with the Department of Hydrology and Meteorology. After the establishment of the meteorological stations, the data will be recorded, documented and analyzed to track the change in weather pattern.

Water Quality Monitoring

In two years interval, water quality of Bagmati, Bishnumati and other rivers should be monitored with special focus on aquatic life forms and drinking water quality. The water quality monitoring of rivers should also be conducted with due priority.

Fire Monitoring

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

Tourism Impact Monitoring

Ecological impact of tourism in SNNP should be monitored. 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, format will be developed by incorporating all the aspects of tourism linkages in livelihood of local communities and survey will be conducted annually to document the changes in host community's day to day life from tourism.

6.3 Capacity Building

Wildlife management requires understanding of wildlife science and skill in field techniques. However, there are limited numbers of experienced staffs in SNNP especially in field techniques, many things are to be learned and shared through various trainings. Need based training 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 meticulously done 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 conservation officer to game scouts and from battalion 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 activities identified are as follows:

Vertical Participant

- Annual sharing and team building workshop;
- Training for community based anti-poaching operation;
- Orientation training on legal issues;

For Frontline Staff

- Basic training on field equipment like GPS, Compass, etc;
- Training on real time patrolling and crime scene;
- Field techniques, including signs and indirect evidences of wildlife;
- Training on anti-poaching operation;
- Orientation training on social mobilization and participatory planning;
- Immobilization and animal handling;
- Basic training on vegetation quantification for recording data in monitoring plots;
- Wildlife health condition;
- Inventory of forest;
- Community mobilization, Buffer zone management and community forests;
- Basic training on watershed management and conservation;
- Basic training on wetland management;

For Rangers

- months course in wildlife management;
- Software applicable for wildlife management, including GIS, Vortex, Distance, SPSS, etc;
- Training of Trainers (general and specialized);

- Training on Real time patrolling and crime scene;
- Wildlife forensic;
- Tourism, wetland and watershed management;
- Community mobilization, Buffer zone management, community forests;
- Refreshment training;
- Training of conflict management;

For Assistant Wardens and Chief Wardens

- Diploma course in wildlife management;
- Training on conflict management;
- Training on appreciative enquiry;
- Training on GIS;
- Tourism, wetland and watershed management;
- Community mobilization, Buffer zone management and community forests;
- Refreshment training;

Training for Army

- Orientation and reorientation training of protection of park and forest resources;
- Crime scene security;
- Anti-poaching operation;
- Wildlife identification and monitoring training;
- Real time patrolling, GPS etc;

Training for BZ

- Leadership Development;
- Office and Account handling;
- Cooperative establishment and strengthening;
- Tourism development, home stay, skill development and income generation activities;
- Conflict mitigation;
- Community mobilization;
- Community forests management;
- Conservation awareness;

Digital Content Management

- All data from research should be well documented, stored and retrieved;
- Sharing the information as per need (for public and within organization)- maintain the secrecy of information as needed;
- Official website of SNNP will be utilized extensively to share information timely;

Virtual Library Management

- Publish documents related to SNNP and its buffer zone;
- Manage and regularly update SNNP website, public interaction via internet;

- Unpublished reports and update which are sharable;
- Manage researcher and students reports, thesis and dissertation;
- Use of software;
- Update and share each and every sharable information as soon as possible;

The staff knowledge, skills and trainings are not sufficient to meet the growing management challenges of the park and BZ. The frontline park staffs and BZ office assistants are mostly untrained. The training requirements include emerging techniques on wildlife management, personnel management, legal and anti-poaching operation, community development and conservation awareness, human rights, wildlife management/handling techniques, conservation education, monitoring and evaluation, firefighting, basic computers, GIS and GPS, PRA, and eco-tourism management, community forests, office administration and management. In addition, basic conservation training is needed for Nepal Army protection unit and special training on conservation and buffer zone management for buffer zone committees. Limited amenities such as uniforms, few field gears and *Rasan* (food) are provided to the park staff. The provision of suitable infrastructures and additional services, availability of vehicles, rain coat, boots, camera, telescope, night vision scope etc. is very important to motivate and enhance staff capacity to achieve goals.

CHAPTER 7

Species Conservation Programme

7.1 Common Leopard Conservation

7.1.1 Conservation efforts, significance and status

Common Leopard (*Panthera pardus*), an umbrella species at an apex of food chain, is an indicator of healthy ecosystem in the mid-mountain as a flagship species. In Holy epic Veda it was named "Spotted Tiger"(Chitra Vaygra) (Shrestha, 1981). The leopard is listed as vulnerable on the IUCN Red List because leopard populations are threatened by habitat loss and fragmentation, and are declining in large parts of the global range. Leopards are hunted illegally, and their body parts are smuggled in the wildlife trade for medicinal practices and decoration.

Common leopard is a flagship species for conservation ecosystem and harbours largest population of this species in the in mid-mountain world. Due to continuous conservation efforts in the mid-mountain through community forests, the population of common leopard increased in the recent years in Nepal. Now a day the number of leopards is in good number in SNNP due to the management has focused on habitat management, patrolling and anti-poaching activities. Conservation of leopard habitat in SNNP has demonstrated great success. But the number of leopards has not counted yet.

7.1.2 Issues

Major issues of concern are

- Habitat loss
- Poaching and illegal wildlife trade
- Human-leopard conflict and retaliatory killing
- Leopard straying outside of the park

7.1.3 Strategies

- Ensure protection in leopard bearing and sensitive areas
- Promote habitat outside PAs and corridors and initiate management activities in order to secure movement and maintain viable population
- Enhance capacity, develop facility and generate funding
- Improve habitat for accommodating the increasing leopard and prey population
- Develop long-term leopard Conservation Vision for Nepal (Policy) such as Common Leopard Conservation Action Plan

7.1.4 Activities

- Sensitive area monitoring (use of technology)
- Quick response team with well-equipped tool and facilities
- Conduct regular wildlife crime control training/s
- Manage rescued/problematic leopards.
- Explore the prospects of long- term partnership for leopard conservation.
- Launch effective conservation and awareness programmes at the local level

7.2 Clouded Leopard

7.2.1 Conservation efforts, significance and status

The clouded leopard (*Neofelis nebulosa*) is a wild cat occurring from the Himalayan foothills through mainland South East Asia into China. Since 2008, it is listed as Vulnerable on the IUCN Red List.

The Government of Nepal in National Parks and Wildlife Conservation Act, 1973 has included the clouded leopard in the list of protected mammals and but not conducting various conservation activities to conserve this magnificent animal.

7.2.2 Issues

Major issues of concern are

- Habitat loss
- Poaching and illegal wildlife trade

7.2.3 Strategies

- Manage habitiat
- Promote habitat outside PAs and corridors and initiate management activities in order to secure movement
- maintain viable population

7.2.4 Activities

- Sensitive area monitoring (use of technology)
- Quick response team with well-equipped tool and facilities
- Conduct regular wildlife crime control training/s
- Explore the prospects of long- term partnership for Clouded Leopard conservation.
- Improve habitat for accommodating the increasing clouded leopard and prey population
- Launch effective conservation and awareness programmes at the local level
- Develop Clouded Leopard Conservation Action Plan

7.3 Spiny Babbler Conservation

7.3.1 Conservation efforts, significance and status

Spiny Babbler (*Turdoides nipalensis*) or Kande Bhyakur in Nepali is a rare species of bird found only in Nepal. It is found in restricted range but till now researchers have reckoned the species aren't to be under vulnerable category as the thresholds is summarized under the range size criterion. It can be sighted easily around the heart of Nepal; the Kathmandu valley, distinctively around the Tokha, Godavari and Phulchoki area. It is rarely to be foreseen by the human eyes but on the contrary the bird is very common. The population size of this bird is unknown.

The spiny babbler is mostly found in moist tropical and sub-tropical scrublands, and also in areas a few scattered trees, at altitudes of 900-2100 m. It is the endemic species of Nepal

Spiny Babbler faces a number of threats at present.

7.3.2 Issues

- Habitat loss
- Haphazard forest fire
- Conversion of shrub land into forest

7.3.3 *Strategies*

- Regular Spiny Babbler monitoring on periodic basis

7.3.4 Activities

- Zonation of SNNP (Restricted zone and use zone)
- Collaboration with relevant stakeholders to protect spiny babblers.
- Form joint 'Spiny Babbler Watch Group'
- Detailed study on the causes of low survival rate of Spiny Babbler in SNNP
- Focus awareness campaign to hit the problem area and targeted communities
- Allocate area and develop demonstration plot for babbler protection

7.4 Pangolin Conservation

7.4.1 Conservation efforts, significance and status

Pangolin or the scaly ant eater is an elusive, nocturnal, non-aggressive and burrowing mammal. It is known as "Salak" in Nepali. Only two species of pangolins i.e. Chinese Pangolin *(Manis pentadactyla)* and Indian Pangoline *(Manis crassicaudata)* are reported in Nepal.

The Government of Nepal in National Parks and Wildlife Conservation Act, 1973 has included the pangolin in the list of protected mammals and but not conducted various conservation activities to conserve this 'friends of farmer' animal. In the recent global assessment of pangolins by IUCN Pangolin Specialist Group has assessed Chinese pangolins as Critically Endangered and Indian pangolins as endangered species.

In Nepal, Pangolins are found in diverse areas ranging from the *Terai* to the mid-hills occupying different habitats from grasslands, reforested areas, bamboo and coniferous forests and agricultural lands. Habitats of pangolins, however, are seen to be more common in areas with red and brown soils where ants and termites are abundant. Since, habitats

of pangolins are found close to human settlements; they have been threatened by humans. Pangolins are hunted for meat and their scales. The scales and live pangolins are traded extensively across its range. Their habitats outside the Protected Areas (PAs) are severely degraded due to unsustainable harvest of forest resources and over grazing. In addition, pangolins are also affected by climate induced disasters including prolonged draught, fire and landslides.

Its occurrence is more concentrated in the Nagarjun area of the park, where numerous fresh and old burrows can be observed. A few individuals rescued from illegal traders were released in the Shivapuri core area. We should be protected this species from extinction due to poaching**.**

7.4.2 Issues

Major issues of concern are

- Habitat loss
- Poaching and illegal wildlife trade

7.4.3 Strategies

- Effective and efficient Pangolin Conservation Action Plan,

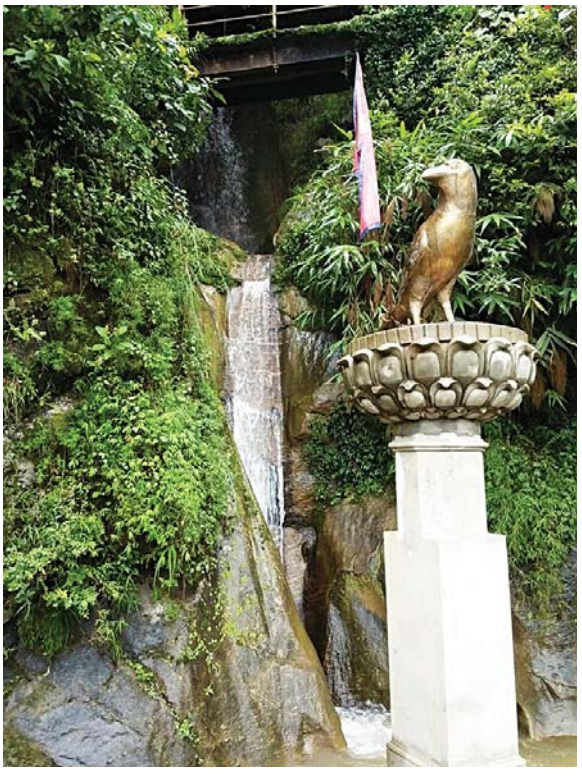
7.4.4 Activities

- Regular area monitoring
- Conduct regular wildlife crime control training/s
- Explore the prospects of long- term partnership for pangolin conservation.
- Launch effective conservation and awareness programmes at the local level

CHAPTER 8

Tourism and Interpretation

8.1 Background



Tourism in protected areas is purely nature based providing recreational opportunities for visitors, generating park revenue, income and employment opportunities to people residing in the BZ. It should be an effective means to raise awareness among visitors through nature education and maximize the benefit to local communities in eliciting public support for conservation. Thus, objective of tourism in the 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 just the message we communicate to visitors but it is all about how we communicate it. Interpretation enhances understanding of visitors about protected area and need for its conservation and they are supposed to appreciate the nature and in turn support to conserve it.

Tourism in protected area should be developed and managed at a level that benefits conservation. It is evident that tourism generates revenue for conservation and conservation promotes tourism. Sustainability of conservation will be enhanced if tourism could support for livelihoods of 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 environmentally responsible travel to experience the nature while promoting conservation and economically contributing to local communities is regarded as eco-tourism. Thus, tourism in protected area should be ecologically sustainable, economically viable and socially acceptable that will ultimately enhance wilderness experience and contributes to conservation and livelihoods of local communities.

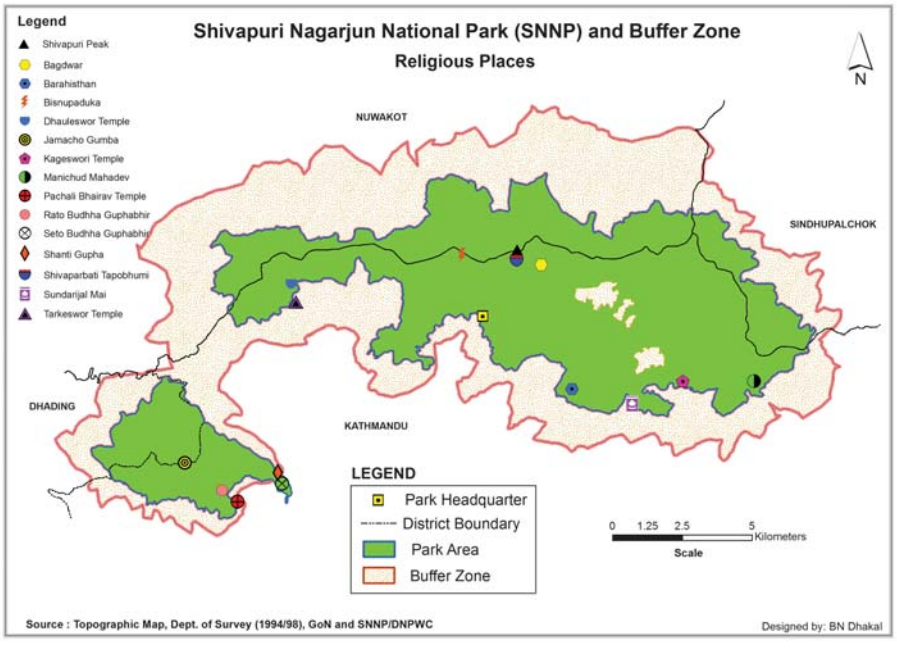
8.2 Tourism Scenario

The nature-based tourism in SNNP started during 1970's with the establishment of watershed conservation area in 1976. Historically because of religious important so many Saint and Hindu pilgrims came to visit for meditation. The park record shows increasing trend in the number of tourists

visiting the park, started with 10,850 in F.Y. 2051/52 BS (1994/95 AD) to 2,09,717 tourists in 2073/74 BS (2016/17 AD). The tourist entry fee constitutes major source of revenue collected by the park each year.

The main attraction of the park is scenic view, biodiversity, forest, wilderness, avifauna, spiritual fitness, religious sites; trekking, hiking and soft adventure is a promising site for ecotourism development. There is a long history of tourism development in the Shivapuri area. Historically Dr. Francis Hamilton was the first who conducted botanical survey in 1920 at Shivapuri hill and Dr. Hudson, Ambassador of UK, collected and studied birds.

The people in the buffer zone of the park follow Hindu and Buddhist culture. Visitor can enjoy Aryan and Mongolian culture. Shivapuri peak is a holy place for Hindus and source of holy rivers Bagmati, Bishnumati and Salinadi. SNNP has important pilgrimage destinations including Bagdwar, Bishnudwar, Shivapuri Peak, Jamacho, Buddha Gupha as well as Manichur Mahadev, Kageshwori, Sundarimai, Baudeshwor, Tarkeshowr, Pachali Bhairav and Nagigumba that provide opportunities for recreation, hiking, spiritual fitness and wilderness.



Map 8: Religious sites in SNNP

The Kathmandu based tour/trek operators conduct regular tourism activities like a day-hike to Shivapuri Peak, viewing snow peak panorama of Annapurna to Everest Range and back through visiting Nagigumba. This has become the most popular activity which is taken by most of the international visitors, followed by bird watching, Jungle walk and cycling the surrounding; endemic tours like watching butterfly, dragonflies, as well as transition to the long trek packaged to Helambu and Lamgtang.

SNNP is one of the prime tourist destinations of Nepal attracting average 1,67,500 visitors in a last five years. The annual tourist influx last year (July 2016 to June 2017) was 2,09, 717, out of which 1,93,138 were Nepalese and 16,579 were foreigners. All together there are 9 entry points in the park from where visitors can enter, but Sundarijal entry point alone received 77,818 tourists (54%) in FY 2072-73 (2015/16 AD). In totality, the development of tourism in southern part of the park is more pronounced in recent years. Other areas are also being developed as tourism apart from Sundarijal, Panimuhan, Kakani, Chisapani and Nagarjun at a wider pace.

There are limited facilities developed for the visitors inside the park. Visitors can enjoy nature walk, cycling and hiking and there are hotels and lodges besides a number of restaurants and souvenir shops in the BZ.

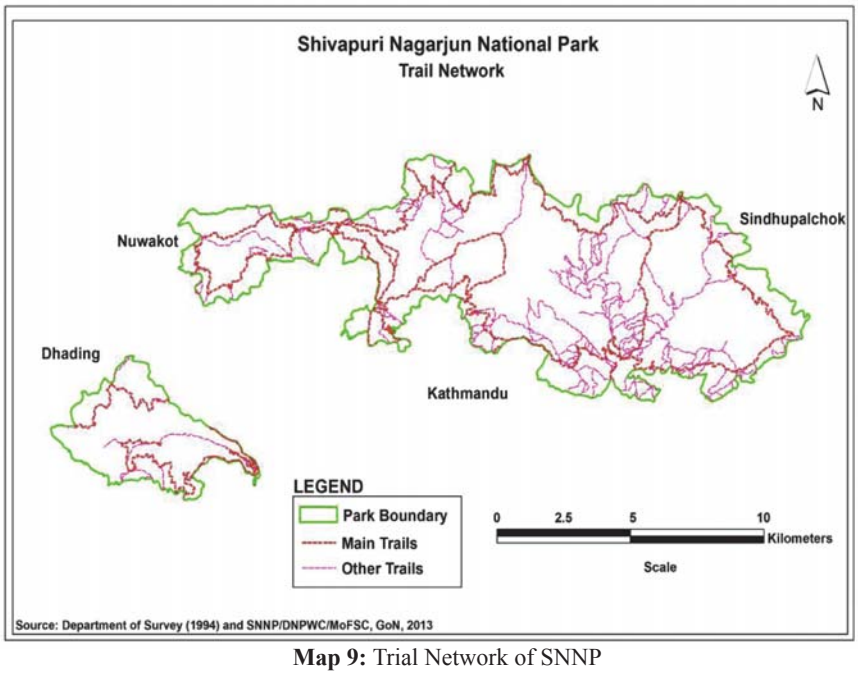
8.3 Approach

SNNP is connected with networks of roads and trekking routes. Public bus and microbus services are available. Common routes are Sundhara-Jamal-Maharajgunj-Budhanilkantha-Panimuhan, Sundhara-Jamal-Maharajgunj-Budhanilkantha-Tokha/Lipikot, Sundhara-Chabahil-Sundarijal, Sundhara-Chabahil-Sankhu-Madichuda, Sundhara/Jamal-Samakhusi-Tokha-Jhor, Sundhara/Jamal-Balaju-Nagarjun, and Sundhara-Jamal-Balaju-Kakani. Visitors can enter into the park through Chisapani, Jhule, Sundarijal, Panimuhan, Jagaat/Gurjebhanjyang, Tokha (Lipikot), Kakani, and Nagarjun Fulbari gates paying entry fees on site.

8.4 Visitors Facilities

The park is virtually surrounded by a 130 km long wall, there is 128 km long forest-road, 90 km foot trails constructed for trekking and jungle walks. The park, thus, has significantly improved the road network and trails making it easily accessible. Since the park is the source of drinking water to surrounding and Kathmandu valley, concessionaires have been avoided inside the park. However, there are few lodges in the buffer zone. Trained and experienced nature guides are available in different entrance gates. Some of the famous hiking routes are:

- Sundarijal-Manichur-Jhule-Chisapani
- Sundarijal-Mulkharka-Chisapani
- Sundarijal-Mulkharka-Okhreni-Baghdwar-Shivapuri Peak
- Nagarkot-Jhule-Chisapani
- Panimuhan-Nagigumba-Baghdwar-Shivapuri Peak
- Panimuhan-Bagdwar-Shivapuri Peak
- Panimuhan-Chhapbhanjyang-Shivapuri Peak
- Panimuhan-Chhapbhanjyang-Sikre
- Panimuhan-Baghdwar-Rholche-Chisapani
- Panimuha-Bishnudhwor-Dandagau-Gurjebhanjyang
- Panimuhan-Nagigumba-Tarebhir-Sundarijal
- Tokha- Jagat-Gurjebhanjyang-GurungGaun
- Kakani-Gurje-Chhapbhanjyang-Shivapuri Peak
- Gurjebhanjyang-Alle-Tarakeshwor
- Panimuhan- Gurjebhanjyang-Kakani
- Fulbari Gate-Jamacho
- Fulbari Gate-Aaindanda-Jamacho
- Fulbari Gate-Jamacho-Sonagaun



Map 9: Trial Network of SNNP

8.5 Tourism Management

8.5.1 Interpretation Facilities

There are limited interpretation facilities available in and around the park. There are no visitor centers that is why cannot provides brief information on various aspects of national park and buffer zone. In addition to these unattended interpretation services, there are 85 registered trained nature guides who provide the attended interpretative services to the visitors, most of them are Panimuhan, Fulbari, Kakani, Sundarijal, Chisapani, Gurjebhanjyang, Manichud-based.

8.5.2 Issues

- Outer periphery of the park or buffer zone has been intensively used that creates tremendous pressure in wetland, watershed, wildlife and its habitat
- Tourism in SNNP is hiking-centric either of foot or cycling and vehicles
- Tourism infrastructure has not been planned well
- The benefit generated by host community from tourism is negligible
- Interpretation facilities of the park is not adequate
- Limited information and conservation awareness programme for visitors

8.5.3 Objectives

- To provide wilderness experience to the visitors through regulated and diversified tourism activities in the park with minimum possible disturbance to water sources, watershed, wildlife and its habitat
- To promote community-based eco-tourism to enhance the socio-economic status of the people living in buffer area so as to garner their support in conservation
- To provide interpretation facilities to the visitors on ecological attributes and biological values and its significance so as to enhance conservation awareness for eliciting their support in conservation

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

8.5.4 Strategies

In order to regulate and manage tourism to maximize the benefit for conservation as well as sharing the tourism benefit to buffer zone community, the following strategies are proposed:

✓ Define routes for jungle drive, nature walk in national park and buffer zone

- Jungle Drive

  Route 1: Fulbari-Jamcho-Fulbari Gate,

  Route 2: Fulbari-Jamcho-Sonagau-Fulbari

  Route 3: Panimuhan-Bishnudhwor-Dandagau-Gurje Bhanjyang-Panimuhan

  Route 4: Panimuhan-Nagigumba-Sundarijal-Panimuhan
- Nature walk: Sundarijal area, Manichuda area, Panimuhan area, Gurjebhanjyang area, Tarakeshowar area, Fulbari Area, Jamacho area, Kakani Area, Chisapani Area, Bishnudhwor area, Bagdhwor area, Shivapuri Peak Area

✓ Develop code of conduct to regulate tourism activities in the park (Golden Rules)

- Proper dress up
- No use of alcohol and no smoking
- Keep silence
- Follow the park rules and instructions
- Don't chase animals
- Do not throw litter inside the park area, rather bring it back with you

✓ Develop Tourist Stop over (Resting places) in Chhap Bhajyang, Shivapuri Peak, Bhanjyang, Chisapani, Manichud, Jamacho, Nangedanda).

- Beverage, only cold drinks and drinking water
- Dry/fast food
- Drinking water and Toilets
- Install sign post in appropriate location

✓ Develop view towers in Chisapaani, Shivapuri, Kakani, Jamacho, Deurali etc.

✓ Interpretation centre- one in Sundarijal, Fulbari area and the other in Panimuhan area).

✓ Electronic ticketing for entry permit (Sundarijal-piloting).

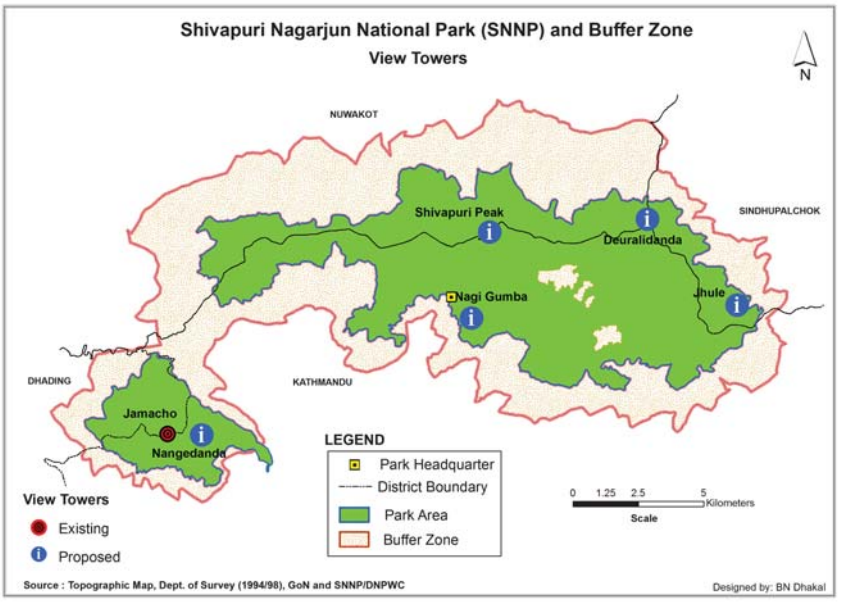
✓ Rationalize tourism zone in terms of area and its use pattern, *i.e*. tourism zone could be delineated in terms of route used not in terms of the area of use and the route with critical habitat condition and water sources could be closed either seasonally or permanently.

✓ Initiate monitoring on the impact of tourism on ecological aspects to determine Limit of Acceptable Change which will help in devising site-specific method for regulating tourism.

✓ Devise plan to minimize the negative impact such as minimizing crowd, noise and dust, examine the prospects of developing permanent tracks with natural look to minimize crowd and noise.

✓ Explore the prospect of promoting low volume high value tourism designating the 'Limited Tourism Zone' in inner core of the park, *viz.* Alle, northern aspect of Shivapuri hill, most of the drinking water sources of major river system.

- ✓ 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.
- ✓ Devise a set of Conservation Code of Conduct for visitors and implement it strictly.
- ✓ Trained more nature guides and develop nature guide based tourism.
- ✓ Publication of brochure on different aspects of the park relating tourism activities.



Map 10: View Towers of SNNP

8.5.5 Institutional Setup

- Provide responsibility to planning section 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, extent and capacity of the facilities to be created, employment to local people, social and environmental responsibility, etc.

8.5.6 Impact minimization

- Study the impact of existing tourism practices in water sources, watershed, wildlife and its habitat, religious sites both positive and negative, such as enhanced protection through increased vigilance or disturbance from noise, garbage and determine the tourism zone accordingly.
- Promote low volume high value tourism designating the 'Limited Tourism Zone' as a sub-zone of Tourism Zone.
- Devise the plan to minimize negative impact such as minimizing crowd, noise and garbage.

8.5.7 Tourism Diversification

- Promote tourism facilities available in the park by marketing it in a package such as jungle drive, nature trail, bird watching, etc. and explore the potential of developing some other eco-friendly tourism attractions.
- Develop selected indigenous villages as a tourist destination- 'Tamang Village'.
- Develop a package for home stay tourism in such villages.

- Establish museum cum cultural center in these selected villages and form the team of artist to perform cultural show regularly.
- Develop package with the combination of different activities.
- Build and enhance people's capacity to initiate tourism enterprises through training for nature guide, hospitality, hygiene, housekeeping, cooking, first aid, cultural show etc.

8.5.8 Nature Interpretation

- Establish an interpretation centre at Panimuhan, Fulbari gate and Sundarijal.
- Enhance the capacity of nature guides in nature interpretation specifically on plants, insect, fishes, herpetofauna, bird and mammal identification through refresher trainings and some experience sharing activities and develop a system for upgrading their title as well as increasing incentives based on their performance (Junior/Trainee Guide, Nature Guide and Naturalist).
- Initiate the conservation focused programme in schools of buffer zone through Training of Trainer (ToT) on biodiversity conservation in general and significance and current management of SNNP in particular.
- Strengthen '**Conservation club' (*Samrakshan Bal sanjal*)** programme in schools of buffer zone designing specific nature conservation course for informal education and also involve them in conservation awareness activities like conservation quiz, speech competition, essay competition, conservation drawing, newsletter, poster, wall newspaper publication, conservation documentary etc.
- Develop a package for school students of buffer zone for a tour to park area and conduct theme-based nature day camp and also organize interaction with eminent personalities in the field of wildlife conservation.
- Special day celebration through various conservation awareness activities with the participation of all stakeholders at local level, including school students. Some special days are World Environment Day (5 June), International Biodiversity Day (22 May), World Wetlands Day (2 February), Wildlife Week, etc.
- Conduct excursion for local people to the park, take them to visitor centre and arrange documentary show.
- Conduct conservation awareness campaign at school and villages of buffer zone with conservation focused cultural show, street drama, concert, documentary show, etc.
- Develop **'Spiny Babbler'** birding site.
- Develop '**Sister Park**' concept for sharing experiences, knowledge and ideas with national and international park and conduct exposure visit inside and the outside the country.

8.6 Activities and other setups

- Develop a separate tourism management plan for SNNP addressing new issues and challenges so as to grab the opportunities from eco-tourism promotion.
- No cable car and other such tourism infrastructures in the park which impacts are negative for drinking water sources, watershed of Holy Rivers Bagmati and Bishnumati, wildlife and its habitat.
- Approval for new entrance gates in different locations Viz. Ichangu, Mudkhu, Panchmane, Baluwa (Tarebhir), Mahankal and Manichud.
- Control of over crowd of visitors.

CHAPTER 9

Special Programme

9.1 Payment for Environmental Services (PES)

9.1.1 Context

Ecosystems provide human society with various services that include provisioning of environmental goods (e.g., food, fiber and fuel), regulating (e.g., climate, flood, erosion), supporting (e.g., nutrient cycling), and cultural with aesthetic and recreational values. Potential of these services in PAs are enhanced because of their protection and management status. Generally, regulation of climate, purification of air and water, protection from soil erosion and nutrient cycling are among the services that are available in PAs (Defra, 2007).

Being a mid-mountain representing protected areas, SNNP has secured high value of rich biodiversity and potential of ecosystem services. Drinking Water potential is the key issue to assess and build mechanism for the payment of its values to the conservation entities. Roughly SNNP contributes water to over 4000 ha of agricultural land and fulfills more than 60 percent water demand of the Kathmandu valley. The southern aspect of SNNP discharges 226.7 million liters of water per day, which is higher than the water demand per day for the valley (Kunwar, 2008). However, unsustainable marketing of water resources by external business companies without the involvement of local people is a major concern of local communities in SNNP (DNPWC, Report 2013: Task 3.3).

There's a need of well interactive regulatory mechanism to pay a value of watershed conservation and pricing of natural water treatment. Firewood supply to BZ communities is another important factor that has been raised as severe issues among PA authority and surrounding people. When hundreds of families inside the core area have been collecting firewood for making liquor, it is providing key sources of livelihood to the people of Sundarijal, Manichud, Kakani, Gagalfedi and others. Being an urban-centered PA, it is providing regulation of air pollution services, recreational services and aesthetic values and research opportunities. Valuation of watersheds and forested areas and carbon sequestration by SNNP forests are the areas of further research.

9.1.2 Issues

- Over harvesting of water for drinking, irrigation, hydroelectricity;
- Industrial and vehicle pollution in Kathmandu valley;
- Aesthetic and recreational value for ecotourism;
- Valuable religious sites;
- Seasonal forest fire, encroachment and soil erosion;

9.1.3 Strategy

- Identification and documentation of PES;
- Preparation of procedure of PES;
- Strengthen awareness programme;

9.1.4 Activities

- Approval of Shivapuri Nagarjun National Park Regulation, 2075;
- Develop PES mechanism;
- Fund mobilization in BZ management to create conservation awareness;
- Regulate of water harvesting;
- Control forest fire and soil erosion;
- Reduce of human wildlife conflict and provide relief fund;
- Promote ecotourism to generate revenue in the park, income and employment; opportunities to the local communities;
- Conduct interaction meeting with different stakeholders;

9.2 Translocation of Okhreni, Mulkharka, Kunegaun and Chilaune settlement of Sundarijal

9.2.1 Context

The settlement was named after the Hindu goddess, Sundarimai. A temple is dedicated to the deity in Sundarijal. Sundarijal is located 15 Kilometres northeast of Kathmandu. It is west of Gagalphedi, east of Nayapati and Baluwa, and north of Aalapot.

Sundarijal covers an area of 5.18 square kilometres. The Bagmati river flows through the settlements, where it is joined by the Shyalmati and Nagmati Rivers. Largely hilly in its terrain with few flat areas, the settlements are covered by forests.

According to 2011 census, Sundarijal had a population of 2,552 individual living in 547 households and 2,586 in 444 individual households in 2001 census. 60 percent of the town's folk are Buddhists, while 40% minorities of Hindus are present.

No modern technology for this is in existence, as farmers only use traditional techniques. In the northern part of the ward, the predominant crops are millet and maize, although cultivation also includes barley and some vegetables. In the southern area, rice, wheat, barley, maize, potato, vegetables and millet are grown.

The vegetation of the area consists of mostly pine, oak, rhododendron, and other forest types. Wildlife recorded in the area includes the Himalayan black bear, leopard, jungle cat, wild boar and rhesus monkey. The area around Sundarijal is the habitat of 177 species of birds, which includes at least nine threatened species, many species of butterflies with several endangered species, and different species of mushrooms.

A special task force has been formed by the Ministry of Forests and Soil Conservation, where Chief Conservation Officer of the park is the coordinator and the Assistant Conservation Officer is the member to examine in detail the feasibility of resettlement of Mulkharka, Okhreni, Chilaune and

Kunegaun villages. Feasibility study should include the possibility if any for resettlement and financial and social aspects of resettlement. Now, the task force has submitted report to DNPWC.

9.2.2 Issues

- Impact on Bagamati watershed and water quality and quantity of drinking water due to settlement in the watershed area.
- Dependency of forest resources for livelihoods and Impact on forest and wildlife resources
- Increasing rate of human wildlife conflict
- Inadequate infrastructure development in comparison to lower settlements
- Insufficient livelihoods opportunities
- Encroachment of park area
- Illegal felling of trees and collection of firewood
- Poaching and illegal trade of wildlife parts and medicinal plants
- Pollution in the Bagmati river

9.2.3 Strategy

- Documentation of private land and HHs
- Resettlements of villages in safe and appropriate location in i) Garadol, Nayapati, ii) Jagdol, iii) Dhakalgaun, Puwargaun Gagalphedi.
- Strengthen Awareness

9.2.4 Activities

- Prepare a plan to relocate settlements in appropriate location
- Create awareness among the communities, decision makers and other stakeholders

9.3 Conversion of pine forests into broadleaved forests

9.3.1 Context

Pine forest covers an area of about 752.5 ha. and constitutes the forest stands that are predominantly Chirpine. The Chirpine forests are found mainly on the southern slopes of Bagmati watershed. There is only a small area under natural Chirpine forest; most of the Chirpine trees were planted. The major associates found in this forest type are; Katus (*Castanopsis indica)*, Mahuwa (*Myrica esculenta)*, *(Pyrus pashia)* and Chilaune (*Schima wallichii)*. The common shrubs are Chutro (*berberis asistata)*, Aiselu *(Rubus ellepticus)*, and *Myrsinese miserata*. The common herbs are, *Gleicenia, Adiantum,* and *Taraxa cumofficinales*. Most of the Chirpine forests are plantations scattered all over the southern slope of the watershed.

The forest floor is an important part of the hydrologic system of a forested watershed. For storms in which the amount of rainfall is less than the water-holding capacity

of the forest floor, for the initial period of larger storms, the hydrologic properties of the forest floor are major factor, determining infiltration rate and overland flow. Water storage by the forest floor may mean reduced overland flow, decreased erosion, greater loss by evaporation, and a with-holding of water from use by plants.

Associated with the reduction in organic matter after fire is a reduction in the water storage capacity. Austin and Baisinger (1955), reported a reduction in moisture-holding capacity in the top i in. of soil of 33.7% after fire. Ride out (1949), reported that the water holding capacity of soils in British Columbia was reduced immediately after burning, and required 18-19 years to completely recover. Dyrness et al. (1957) concluded that reduction in water-holding capacity was largely due to lower amounts of organic matter after fire. Comparison of the spruce-fir, young pine, and mature pine on Marmot basin supports this view. Under mature pine the water held after draining and the water storage capacity were 1.20 cm and 2.31 respectively compared with 1.94 cm and 1.93 for spruce-fir, and 0.85 cm and 1 .35 for young pine. This strongly suggests that the difference between spruce-fir and young pine is mainly the result of fire, and that the difference in hydrologic characteristics decreases as the pine matures (google.com/2017).

9.3.2 Issues

- Seasonal forest fire in the pine forest area and less organic matter
- Less water holding capacity
- High surface run off
- Low biodiversity in pine forest in comparison to broadleaved forest

9.3.3 Strategy

- Identification and documentation of area
- Strengthen awareness among the communities and stakeholders

9.3.4 Activities

- Establish demonstration plot to compare water holding capacity and surface run off
- Broadleaved tree (seedling) plantation in chirpine forest
- Create Awareness among the communities and stakeholders

9.4 Moderating the climate change impacts

9.4.1 Context

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

Increasing temperature, unpredictable rainfall and reduced water availability, invasion of alien plant species (such as *Ageratina adenophora*, *Lantana camara* and *Parthenium hysterophorus*) increased incidence of diseases and weeds on crops, early flowering, ripening and budding of some plant

species are the commonly observed climate led events in SNNP (Ghimire 2012). A 109 year tree ring chronology of *Pinus roxburghii* dating back to 1902 showed significant correlation between tree rings and rainfall during winter, particularly in the month of February (Ghimire, 2012). Similarly, traditional agro-based livelihood system of Bagmati river basin is affected by recent global warming trend (Shrestha, 2007). For example, there will be a greater reduction in maize yield (31% - 45%) by 2060 A.D if the Bagmati river basin followed all Nepal trend by then (Shrestha, 2007).

In the Central Himalaya, Mid hill forests are said to sequestrate more atmospheric carbon than other forest types (Ranjitkar, 2010). The luxuriant growth of temperate forest in SNNP is the sign of good amount of carbon storage. Although few attempts have been carried out to assess the carbon stock pattern in soil and vegetation, the immediate focus is needed to introduce carbon credit mechanism in the Park.

9.4.2 Issues

The major issues of concern in the face of likely impact of climate change in SNNP and BZ are;

- Destroying the habitat of endangered wildlife species such as Clouded Leopard, Pangolin etc
- Disastrous effects of flooding resulting from watershed degradation; resulting human settlements downstream
- Dry up water sources due to increasing temperature
- Loss of biodiversity in the park and BZ

9.4.3 Strategy

- Strengthen awareness among stakeholders
- Identification and documentation of climate change impact on biodiversity, livelihood and watershed

9.4.4 Activities

- conduct research of impact of climate change in biodiversity and water resources
- create awareness among the communities
- Promoting community-based adaptation through integrated management of agriculture, water, forest and biodiversity sector
- Building and enhancing adaptive capacity of vulnerable communities through improved system and access to services related to agriculture development
- Community-based disaster management for facilitating climate adaptation
- Empowering vulnerable communities through sustainable management of water resource and clean energy support and promoting climate smart rural settlement

9.5 Coping with the impact of Earthquake

9.5.1 Context

SNNP and 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 and security posts infrastructure as most of the buildings and security posts and boundary wall were severely damaged. The preliminary damaged assessment has reported the damage of 23 buildings of SNNP, most of the structures in almost all units of both battalions and about 55 kilometers of boundary walls through out the park area. Estimates shows that the damage of the boundary wall alone is equivalent to more than

53 million. 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 ecological function processes in this area, which has not been documented yet. The local communities informed about dry up of water sources after earthquake. Park office have already provided alternative water sources for their drinking water. The local communities still have not reconstructed their houses after the earthquake.

9.5.2 Issues

- Damaged, demolished and crack caused by earthquake to the buildings and other infrastructures including boundary stone and brick wall
- Damage to the community infrastructures and private properties in BZ
- Land slide and soil erosion
- Dry up water sources and not properly supply of drinking water, invest much amount to bring water from different sources by the communities
- Inadequate budget and construction materials available for the infrastructure damaged in SNNP and its BZ

9.5.3 Strategy

- Identification and documentation of earthquake impact
- Identification of earthquake resistant structures and follow the earthquake resilience norms
- Strengthen awareness among the park staff, army personnel and BZ communities

9.5.4 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, water sources, watershed and landslide in SNNP and BZ.
- Implement the building codes developed by the GoN to promote earthquake resistant building construction in SNNP and BZ.
- Maintain the boundary wall in SNNP.

9.6 Keeping the Bagmati and Bishnumati rivers clean

9.6.1 Context

The Bagmati river has its origin in Bagdwar from the southern slope of Shivapuri *lek*, north of Kathmandu basin at an altitude of about 2650m and flows straight to south-east cutting Mahabharat range (Sharma, 1977). Starting from Mahabharat range in the north it flows down to the plains of Nepal in the south and merges into the Ganges in India. The river Bagmati in the Kathmandu valley runs southward and then westwards bordering Kathmandu and Lalitpur districts, then again takes a course towards south after receiving Bishnumati river. Its total length is about 196 km in Nepal and the catchments area of the river is 3610 sq. km. which is 2.25% of total area of Nepal (Shanker & Kiran, 1976).

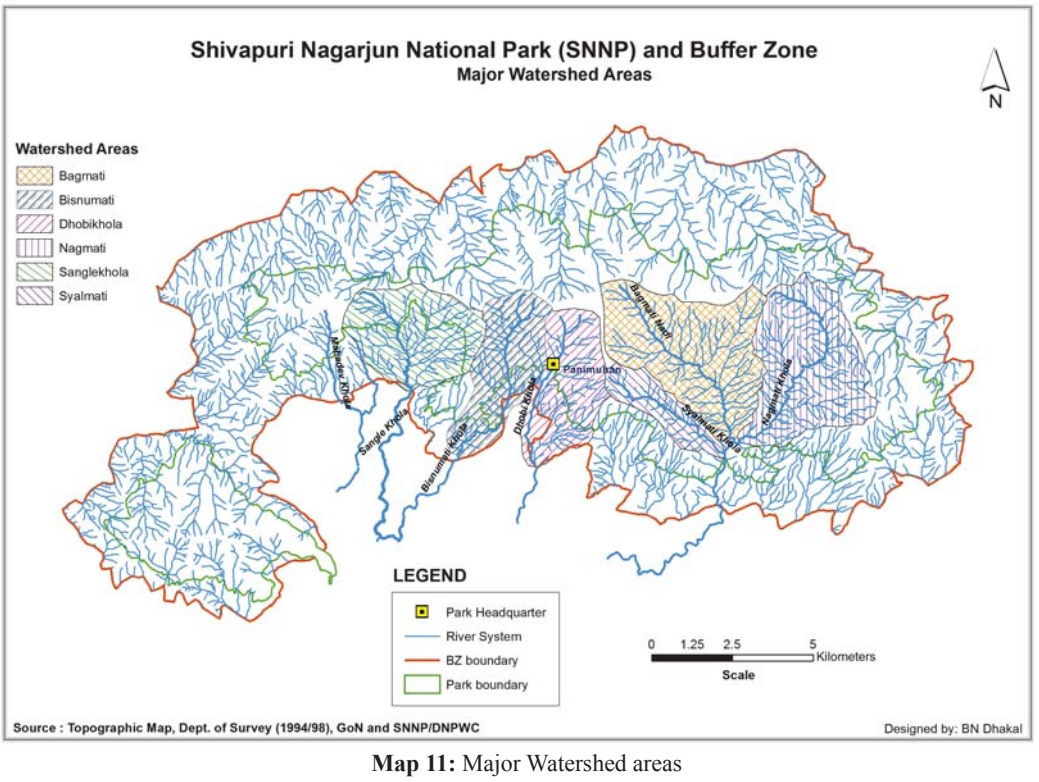
The Bagmati is not a snow-fed river and most of its water is contributed by run off. There are 24 main tributaries originating from Mahabharat and Siwalik lekh which fed the river Bagmati (Tuladhar,

1979) and (Pradhan, 1998). But in its way within the Kathmandu valley, it receives only 5 main tributaries as Monohara khola, Balkhu khola, Dhobi khola and Nakkhu khola.

Water resources from the Bagmati River System are important for hydroelectricity, small-scale irrigation and as drinking water sources. About 82% of water volume is extracted daily from the surface water sources for drinking water supply in the Valley. On the other hand, this river is extensively being used as dumping sites for solid wastes, outlets for domestic sewerage and industrial and agricultural effluents.

Bishnumati River 15.2 km. in length origin from *Bishnudwar* that flow from north of Kathmandu valley. It flows at the west center of Kathmandu city and the heart of the city core. The Bishnumati river is an important tributary of the Bagmati river and has a catchments area of 109.3 sq.km (10929.73 ha *source:* BAP) in west part of Kahmandu valley and west part of core city in Kathmandu Metropolitan City. This river can be divided into three parts: (i) the upper protected area of SNNP of Bisnhnudwar, (ii) the middle rural and peri-urban and (iii) the urban up to Teku *dovan*. Main sources of water in Bishnumati river system are rainfall and natural springs. The average annual rainfall is 1900 mm of which about 80% occurs only during monsoon (July-Sept). Bishnumati river in the valley and core city has very high value of holy for daily life resources and human settlements in the Kathmandu city.

Bishnumati river runs from the altitude of more than 2200 m. altitude. It is surrounded by the high hills of Mahabharat Range forming a bowl-shaped valley floor. 2.7 km long stretch of water is under the core area of National Park. Second segment is from Budhanilkantha up to Tokha Chnadeswori. The total length of this segment is 3.2 km and the width varies between 10m to 20m. The river bank along this section is almost entirely encroaching by agricultural land. At present within this segment the water condition is not seriously bad, but none the less it is unfit for drinking purpose (BRIP, 2012).



Map 11: Major Watershed areas

9.6.2 Issues

- Lack of guidelines for properly managing herbicides, pesticides, toilet flushing;
- Garbage management is an ongoing challenge to keep the Bagmati and Bishnumati clean;
- Several point and non-point sources of pollution exists in the rivers;
- Inadequate knowledge on proper disposal and recycling of the solid waste among the BZ communities;
- Inadequacy of coordinated effort to address the issue of garbage and pollution in the Holy rivers Bagmati and Bishnumati;
- Lack of guidelines for properly managing the garbage in BZ;
- Inadequacy of the fund required for maintaining sanitation in the Bagmati and Bishnumati rivers;
- Garbage due to visitors inside the park in BZ.

9.6.3 Strategy

- Identification and documentation of pollution prone zone
- Identification causes of pollution
- Strengthen awareness among the BZ communities

9.6.4 Activities

- Mobilize and involve the local communities and community based organizations in garbage collection, recycling, and destruction in the BZ;
- Create no plastic zone and use of fiber bag inside the park;
- Coordinate with BZ communities, municipalities and tourism related organizations and other stakeholders to control garbage in the rivers;
- Explore mechanism for garbage management in the Bagmati and Bishnumati;
- Ensure that settlements have proper sanitation infrastructures including strom water drains, toilets, incinerators, collection and recycling systems;
- Develop Bagmati-Bishnumati Conservation Club (BBCC) and institutional setup in BZ;

CHAPTER 10

Watershed Management

10.1 Watersheds of Shivapuri Nagarjung National Park :

SNNP has six important river systems. And these river systems have made important watersheds like Bagmati, Nagmati, Syalmati, Rudramati, Bishnumati and Yasomati watersheds. There are some other important sub-watersheds of these main watersheds within the SNNP.

SNNP also contributes some drainage into the watersheds of some other big rivers like Trishuli and Indrawati but the drain areas of these rivers inside the SNNP are relatively small, they are draining to the Northern side and are highly important from the landscape and tourism connectivity point of view. Therefore, the watersheds which are draining to the Northern side of SNNP are not taking into consideration in this management plan. In other words, this SNNP watershed management focuses only that parts of Bagmati, Nagmati, Syalmati, Rudramati (Dhobi khola) watersheds that lie within SNNP. Main rivers and watersheds that originate and lie within the SNNP are as follows:

Bagmati river watershed:

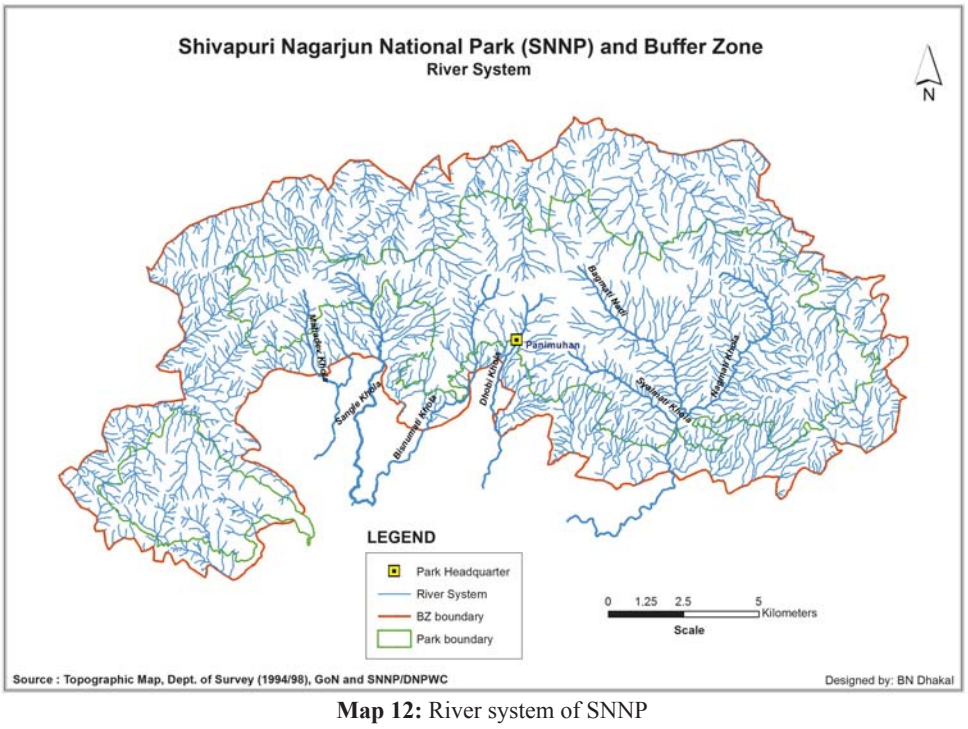
The Bagmati river originates in Baghdwar of Shivapuri hills in the north of the Kathmandu Valley. The total area of Bagmati river watershed is about 15.87 sq.km with the length of 44 km from its origin at an elevation of 2650 m at Shivapuri to Katuwaldaha, which lies at an elevation of 1140m. The Syalmati and Nagmati rivers join the Bagmati near its source in the Shivapuri hills. The settlements like KuneGaon, Chilaune, Okhereni, and part of Mulkharka lies in the Upstream of Bagmati river. Sanitation system in these settlements is very poor as open defecation is widely prevalent in these villages. A large volume of water is diverted for the city water supply by the Kathmandu Upatyaka Khanepani Limited (KUKL) at Sundarijal. Besides, water is also diverted into different locations for irrigation and household use.

Bishnumati river watershed:

Total watershed area of Bishnumati river is 109.3 sq km with the total length of 17.3 Km. It originates from 2300 m altitude from Shivapuri (Bishnudwar). Bishnumati river is a major tributary of the Bagmati river and flowing southward.

Dhobi Khola watershed :

The total watershed area of Dhobi Khola (Rudramati) is 31.2 sq km with its total length of flow about 18.2 km. It originates from 2600 m altitude from Shivapuri Danda and flows south to the heart of the city joining the Bagmati river at Buddhanagar.



Map 12: River system of SNNP

Nagmati river watershed:

The total watershed area of Nagmati river watershed is 14.45 sq. km with its total length of 7.9 km. This river originates from an altitude of 2443m at Dhap. This river merge with Bagmati river at Sundarijal. The under construction Dhap dam lie within the watershed of Nagmati river.

Syalmati river watershed :

The total watershed area of Syalmati watershed is 5.40 sq. km with its total length of 4.8 km.This river originates from 2200 m altitude from middle part of Shivapuri Danda. This river also merge with Bagmati river at Sundarijal

Salinadi:

The total area of Salinadi watershed with in the national park and buffer zone is approximately 15 km^2 with its total length of 6.5 km. This river originates from Manichud (2450 m) altitude at southeast part of Shivapuri hill. This river also merges with Manahara later to Bagmati river at Chyasal.

10.2 Land-use pattern of SNNP

The land use pattern of SNNP is predominated by forest followed by shrub land, cultivated land and grass land respectively. The cover of forest land is 118.391 km^2 (74.45%), followed bush/shrub land 32.52 km^2 (20.45%), grassland 5.13 km^2 (3.22%), cultivated land 2.86 Km^2 (1.80 %) and other features such as cliffs, building, pond/ lakes cover holds 0.088 Km^2 (0.055 %) (SNNP, 2017).

However, the land-use of some key watersheds (upstream area in Sq.km.) of SNNP are:

Table 13: Land-use pattern in different sub watersheds in SNNP

Watersheds	Cultivated land	Forest	Grass land	Shrub/bush land	Water bodies	Sandy area	Total
Bagmati	1.98	13.47	0.48	0	0.01	0	**15.94**
Nagmati	0.45	13.95	0.22	0.01	0	0	**14.63**
Syalmati	0	3.94	0.14	0	0	0	**4.08**
Dhobikhola	0	5.7	2.2	0.03	0	0.98	**8.91**
Bisnumati	0	1.88	2.26	4.54	0	0.38	**9.06**
Sanglekhola	0	0.85	5.35	4.17	0.08	0	**10.45**

Source: SNNP, 2017

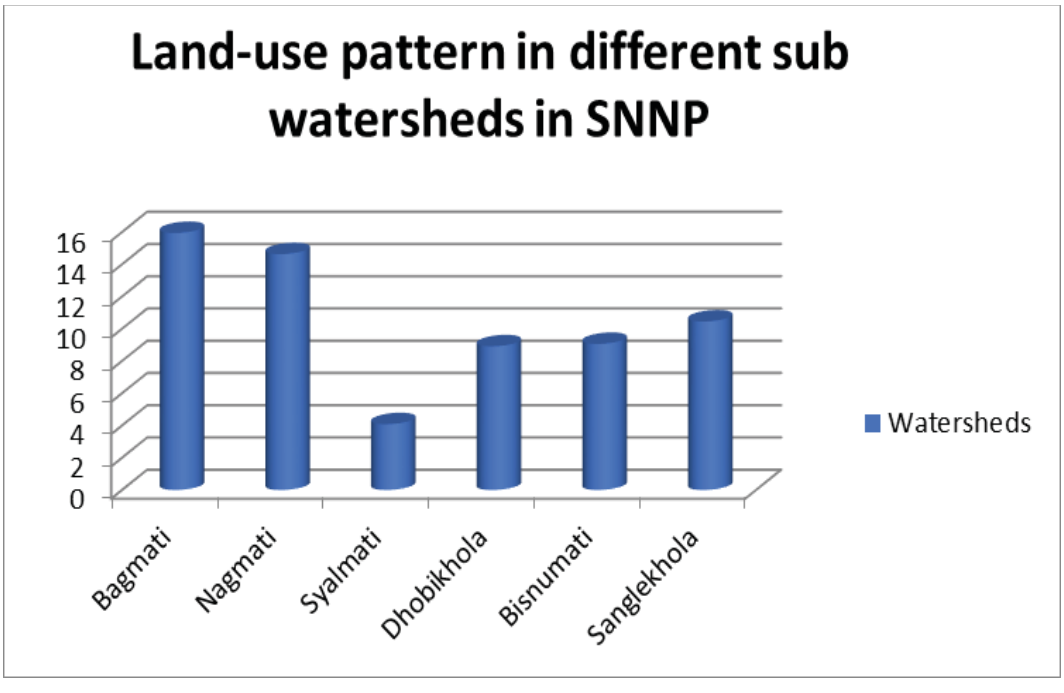


Figure 9 : Land-use pattern in different sub watersheds in SNNP

Table : 14 Distribution of Major Land Capability Class of Land-use in the SNNP *

Class I Land : Terraces Bari and Khet, abandoned land, grasses and shrubs, settlements, landslides, coniferous, hardwoods, mixed woods and shrubs	Slope < 1 ^{0}	5.7 % of total land area of watersheds	Mostly used under land capability, over used and under used, soil conservation work not necessary
Class II land : Terraces Bari and Khet, abandoned land, grasses and shrubs, settlements, landslides, coniferous, hardwoods, mixed woods and shrubs	Slope 1 – 5 ^{0}	9.5 % of total land area of watersheds	Mostly used under land capability, some are over used and some under used, soil conservation works necessary

Class III Land : Terraces Bari and Khet, abandoned land, grasses and shrubs, settlements, landslides, coniferous, hardwoods, mixed woods and shrubs	Slope 5 – 30 ^{0}	62.7 % of total land area of watersheds	Mostly used under land capability soil conservation work necessary
Class IV Land: Terraces Bari and Khet, abandoned land, grasses and shrubs, settlements, landslides, coniferous, hardwoods, mixed woods and shrubs	Slope > 30 ^{0}	22.6 % of total land area of watersheds	Seriously over used, soil conservation work extremely necessary

*Interpretation was done from the Report on Aplication of GIS for Shivapuri Watershed Project. ICIMOD and ISS, Kathmandu, Nepal 1982

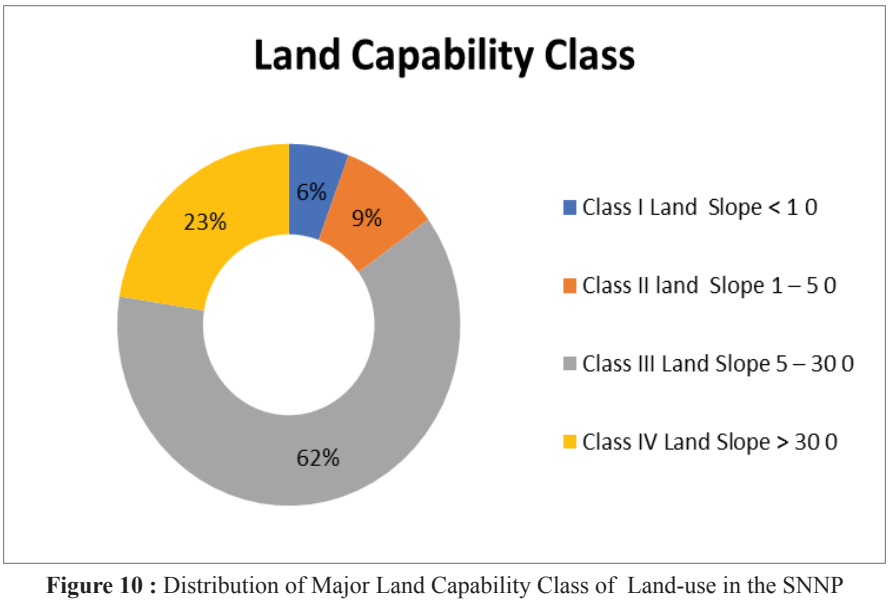
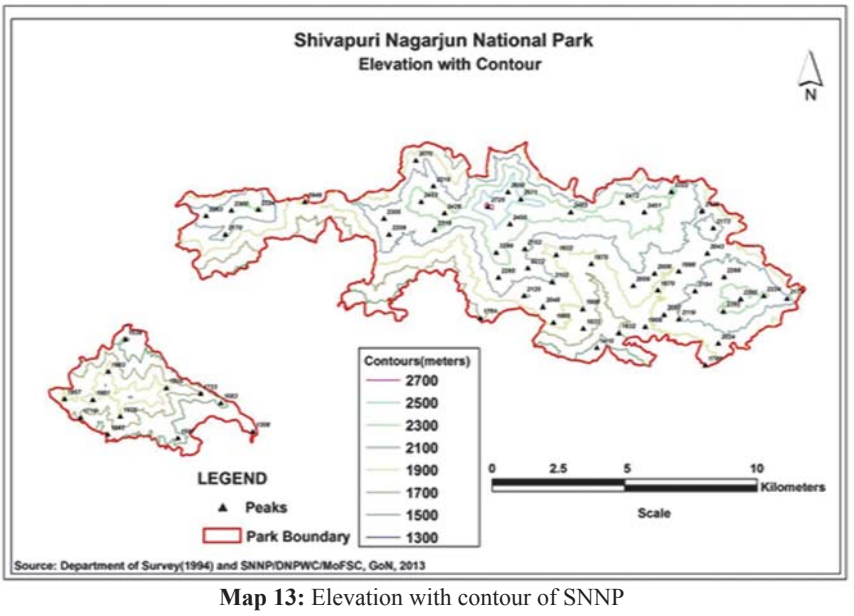


Figure 10 : Distribution of Major Land Capability Class of Land-use in the SNNP

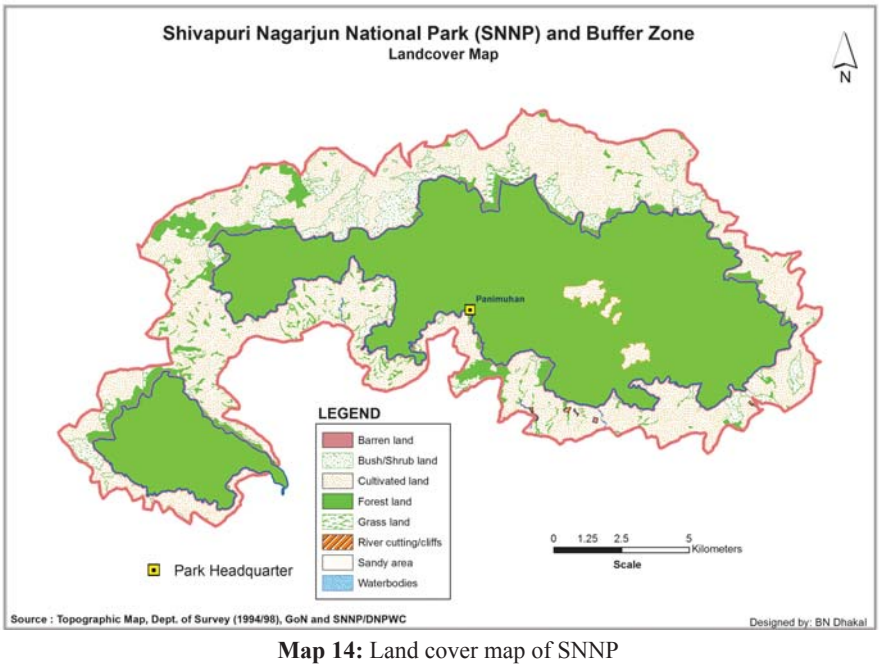


Map 13: Elevation with contour of SNNP

Table 15: Area Under Different Use Conditions of SNNP *

Use Conditions	Percent of total area of watersheds
1. Use with land capability, soil conservation treatment necessary	52.7 %
2. Use with land capability, soil conservation treatment not necessary	29.4 %
3. Seriously over used, soil conservation treatment extremely necessary	1.7 %
4. Over used, soil conservation treatment necessary in limited areas	6.8 %
5. Under used, soil conservation treatment not necessary	9.4 %

*Interpretation was done from the Report on Application of GIS for Shivapuri Watershed Project. ICIMOD and ISS, Kathmandu, Nepal, 1982



Map 14: Land cover map of SNNP

Source: Draft Management Plan of SNNP and BZ, NTNC, 2014

Key Issues of SNNP Watershed Management

From the field observations and consultations with local communities, several issues and challenges have been observed for the sustainable management of SNNP watershed/sub-watersheds. Some of the key issues and challenges that have been observed and tracked during field survey and consultations with local people are as follows:

Issues

- Pressure on forests of SNNP watershed is growing due to increasing demand of firewood for local consumptions, brewing local alcohol and fodder for domestic cattle.
- Occurrence of dry season forest fire is common in SNNP watersheds due to increasing demand of fresh grass for livestock forage

- Conversion of small grasslands and shrub land of SNNP into agriculture land for enhancing livelihoods of the local communities.
- Increasing trends of soil erosion and landslides within the Bagmati watersheds are observed due to poorly designed foot trails, absence of adequate drainages, improper management of rainfall runoff and bad farming practices in the outward sloping agriculture lands.
- Excessive free grazing in the open forest, shrub lands and grasslands.
- Occurrence of invasive species in the grassland, agriculture land and wetland due to overgrazing and pollution of water.
- Enhancing the process of disappearance of water sources in the upstream of the watersheds due to abuse of water sources and destruction of vegetation near the water sources
- Inadequate training and awareness to the communities on consequences of watershed degradation and importance of sustainable management of Bagmati watersheds.
- Pollution of rivers and streams due to free disposal of domestic wastes and increasing use of chemical fertilizers and insecticides in the crop land of Bagmati watersheds.
- Subsistence farming practice and high food deficiency in and around the settlements inside the SNNP watersheds particularly in Okhareni, Mulkarka, Kunegaon and Chilaune
- Increasing use of food grains and fire wood for the preparation of local liquor particularly in Okhareni, Mulkarka, Kunegaon and Chilaune
- Inadequate promotion of alternative energy technologies and potential use of existing energy sources to reduce forest dependency
- Poor public health and sanitation in immediate surrounding settlements of the park
- Inadequate drinking water facility and sanitation, and lack of awareness on safe drinking water
- Inadequate income generating programmes focusing on women, youth and small farmers
- Vulnerability of plant species due to climate change induced disasters such as drought, cloud bursts, declining sources of water and soil moisture

Strategies

- Identification and documentation of watershed of Holy Rivers
- Strengthen awareness among the stakeholders
- Strengthen park patrolling to control illegal felling of forests
- To conduct forest fire control activities

Activities

Under the outputs of each outcome, following interventions under soil conservation a nd watershed management are to be promoted and implemented in the SNNP watersheds/sub-watersheds:

1. **Watershed/sub-watersheds planning**
   - Prioritize watersheds/sub-watersheds
   - Prepare sub-watershed management plan

2. **Infrastructure protection and development**
   - Improve walking Trails
   - Construct and maintain drainage
   - Protect and rehabilitate road slope

3. Land productivity conservation

- Initiate on farm conservation
- Initiate organic farming
- Rehabilitate degraded farm land
- Plant fuel wood, fodder tree and grass
- Distribution and plant fruit tree seedling distribution and plantation
- Conserve outward sloping erosion prone agricultural land
- Improve soil fertility management

4. Community soil conservation and extension

- Protect community water source
- Disseminate and promote alternate income generation programme –IGA, including ecotourism
- Promote eco- friendly household sanitation and waste management
- Promote Clean and efficient energy

5. Group mobilization and Empowerment

- Conduct school education/trainings
- Conduct women awareness trainings
- Provide conservation trainings
- Initiate climate change hazards trainings

6. Prepare watersheds management plan of Bagmati and Bishnumati

7. Prepare Dhap reservoir site management plan

CHAPTER 11

Buffer Zone Management

11.1 Introduction

In order to ensure the active people's participation in biodiversity conservation, the fourth amendment of the National Parks and Wildlife Conservation Act, 1973 brought forth the concept of buffer zone management. Buffer zone is impact area surrounding a park or a reserve encompassing forests, agricultural lands, settlements, village, open spaces and any other land use. The ultimate goal of buffer zone is to achieve the active people's participation in biodiversity conservation of national park and buffer zone. There are two objectives of buffer zone are to conservation and development of biodiversity in BZ and management of buffer zone forest to meet basic needs of forest products of the buffer zone communities and to plough back 30-50 % revenue generated by the park for the upliftment of socio-economic condition and institutional development of buffer zone communities. The National Parks and Wildlife Conservation Act, 1973 (Fourth amendment in 1993), Buffer Zone Management Regulations 1996 and Shivapuri Nagarjun National Park Buffer Zone Guidelines 2017, provide policy and legal framework for buffer zone management programme.

An area of 118.61 km^2 around the national park has been declared as the buffer zone of SNNP in 2016. The buffer zone comprises of the population of over 56,474 spread over 2 Rural municipalities (Gaupalika) and 9 municipalities of 4 districts (Kathmandu, Nuwakot, Sindhupalchowk and Dhading). The buffer zone communities are the principal stakeholders. The park has institutionalized mechanisms in buffer zone to mobilize funds, minimize human wildlife conflict, minimize biotic pressures in the park resources and motivate communities in the participatory management of forest resources. The buffer zone management committee (BZMC) is an apex body under which 11 buffer zone user committees (BZUCs), and 311 user groups (UGs) are formed and institutionalized.

Similarly, buffer zone comprises 29.95 Km^2 (25.25%) of forests, 88.32 Km^2 (74.47%) of agriculture land and 2.616 Km^2 (2.24%) of other land-use. Also, there are registered 54 CFUG's covering 805.95 ha. of forests and 4,665 HHs, 2 LHFs of 100.7 ha. and one Religious Forest of 37 ropani as per the records of above-mentioned district forest (SNNP, 2017).

The BZ is predominantly populated by Tamang, Brahmin, Chhetri and other ethnic groups. Main occupations of the local people are agriculture, animal husbandry, government services, and labor etc. Most of these agriculture and animal husbandry are for subsistence living of the local

community.

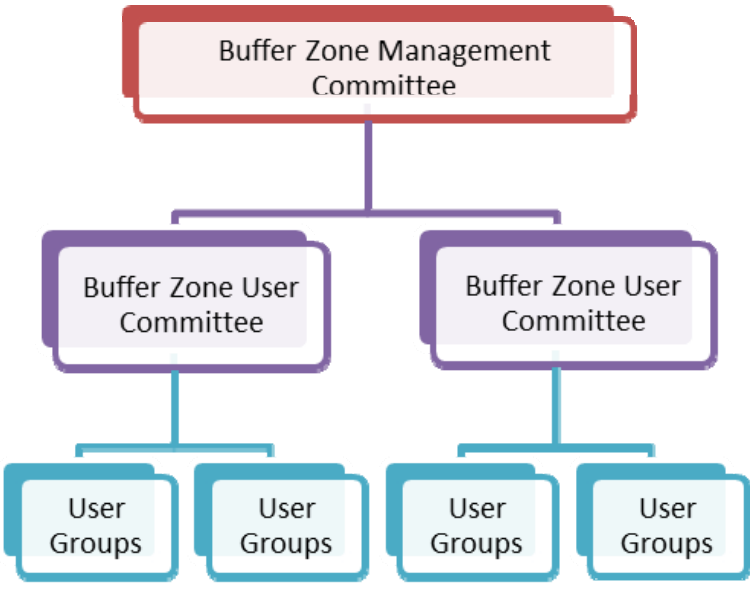
BZ programmes are aimed at institutional development (social capital), human wildlife conflict minimization, alternative natural resource development (natural capital), capacity/skill building (human capital), financial management (financial capital), conservation education and awareness, gender and special target group mainstreaming. In fact, BZ programme is a benefit sharing mechanism which involves sustainable development, landscape level conservation, tourism promotion and reconciliation of park-people conflict. The buffer zone management programme also provides relief to the victims of wildlife. The proposed activity and budget for the buffer zone management is in Annex XIII.

The buffer zone received NRs. 8 million, 50% of the revenue generated by park for conservation and socio-economic development in the last fiscal year 2073/2074 B.S. for implementing various programmes. There is provision in Shivapuri Nagarjun National Park buffer zone guidelines 2073, the BZMC, the Users Committees and User Groups have to allocate 15% of their budget for conservation, 15% for community development, 25% for human wildlife conflict, 20% for tourism development, income generation and skill development, 10% for conservation education and 15% for administration.

Buffer zone programme emphasizes sustainable management and development of the forests through involving local communities as forest user groups. Till now, district forest offices (Kathmandu, Nuwakot, Sindhupalchowk and Dhadhing) has handed over a total of 693.43 ha. area of forest to 54 Community Forest user groups (CFUGs) with 4,665 households and 56,636 users (population) for development, conservation, management and sustainable use of forest. Now, after declaration of BZ all CFs mentioned above comes under the jurisdiction of the park office. In addition, one religious forest and two leasehold forest in buffer zone have been registered. The BZ forests not only provide forest resources to the community but also secure additional habitats to the wild animals; alternative sites for the tourism and income for community development.

11.2 Formation of Buffer Zone Institutions

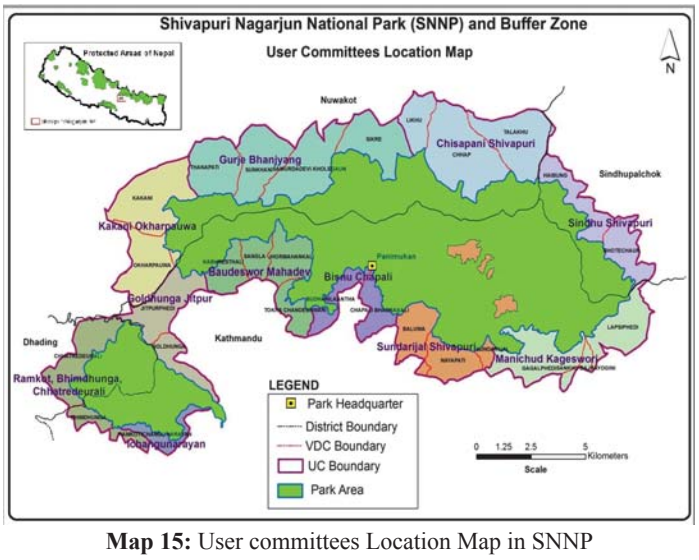
With the division of buffer zone into 11 Units, park authority in consultation with communities, initiated formation buffer zone institutions at different levels as per the Buffer Zone Management Regulation 2052 B.S. and Shivapuri Nagarjun National Park Buffer Zone Management Guideline, 2073 B.S. to manage the area effectively and efficiently. All buffer zone institutions' members will serve for five years. Now, there are 11 User Committees at Unit level and 311 User Groups at settlement level. Each Committee comprises different number of User Groups depending upon the population and geographic area (Annex XII). Each user group shall have seven executive members elected for chairperson, vice-chairperson, secretary, joint secretary, treasurer, one women member and one youth member. Similarly, user committee consists of 13 members including chairperson, vice-chairperson, secretary, joint-secretary, treasurer, six members, one women member and one youth member elected from the ex-officio members of the committee from the user groups under it as per the guideline. The committee has authority to call as invite members one each from BZ CFUGs, tourism professionals, drinking water user committee, environmental teachers' forum, marginalized and deprived group and representative from respective rural municipality or municipality.



All chairpersons of 11 user committees shall be the ex-officio member of the Shivapuri Nagarjun Buffer Zone Management Committee which is the apex body to manage buffer zone. in addition, one representative from each district coordination committee of the districts lying in the buffer zone shall be the ex-officio member to the management committee. The chairperson, vice-chairperson (2), secretary general, secretary will be elected from the user committee chairpersons. Assistant Conservation Officer of the SNNP office designated by Chief Conservation Officer shall serve as member-secretary to the management committee (Table 16).

Table 16: Structure of BZMC

SN	Institution	Number	Status	Remark
	BZMC	1	Chairperson	One among all the BZUC Chairperson
1	BZUC Chairperson	10	Members	
3	Representative of DCC	4	Member	
4	Assistant Conservation Officer of SNNP	1	Member Secretary	



Map 15: User committees Location Map in SNNP

11.3 Management and Operation Plans

As per the Buffer Zone Management Regulation, 2052 and Shivapuri Nagarjun National Park Buffer Zone Management Guideline 2073, Buffer Zone Management Committee requires having 5 years management plan. Similarly, each user committee and user group also needs to have 5 years operation plan for implementing various conservation programmes in their area. It is a bottom up planning process where all user groups and user committees draft their operation plans by compiling user groups' operation plans which are under them. The committees' operation plans are approved by chief conservation officer. Finally, a complete buffer zone management plan is developed by compiling all operation plans of user committees.

11.4 Buffer Zone Fund Payout Arrangement

For this purpose, a 5 years Buffer Zone Management Plan should be approved by the DNPWC on the recommendation of technical committee for releasing up to 50% of the park income to implement the programme. The user committees are entitled to generate their own fund through various sources as per Rule 15 of the Buffer Zone Management Regulation, 2052.

11.5 Perceptions towards the conservation of the natural resources

Local people of the area were found to be positively looking at the conservation of their nature and natural resources including the wildlife. Although their level of exposure to successful conservation practices related to wildlife in other parts of the country was found to be comparatively low, most of their opinions were shaped by the introduction of the Buffer Zones in the areas. Majority of local people believe that the wildlife conservation activities will help strengthen their livelihoods by income generation through ecotourism. The protection of wildlife has a religious and cultural dimension too, however wildlife related illegal activities still exist in the areas.

11.6 Conservation-Management Issues

11.6.1 Socio-economy of villages

There are large numbers of villages in the buffer zone. The park encounters heavy biotic pressure from the peripheral villages. The buffer zone is spread over nine Municipalities and two Rural municipalities of four districts. A survey conducted by the park in 2017 concludes that buffer zone comprises of 12,352 households with a population of 56,474. The occupation of majority of people is agriculture and they are highly dependent on forest resources. Other people are engaged in tourism, service, and business and so on. Main castes of the buffer zone comprise of Tamang, Brahmin, Chhetri, Gurungs, Damai, Kami etc. (SNNP, 2017).

11.6.2 Resource dependency of local people

People living in villages of buffer zone are highly dependent on forest resources for their livelihood. Their day-to-day requirements for fuel wood, small timber for use in agriculture, house construction or repairs and cattle grazing are fulfilled from the forests in buffer zone. In addition, villagers sometimes enter illegally to the park for non-timber forest products for their subsistence use.

The rural people are heavily dependent on forest resources for subsistence agriculture and animal husbandry. There is also a large population of free ranging livestock and rural people are still dependent on park resources and forests outside PA for firewood, fodder and grazing. Majority of old generation

are still practicing the conventional system for living whereas young generation has diversified their way of living engaging in tourism, employment and other income generation activities with the change of time. Local people are using sand, stone and gravel from barren land, rivers and streams of SNNP border and buffer zone for different developmental activities (road, buildings, culverts/bridges, etc).

11.6.3 Assessments of inputs of line agencies

The major line agencies except the National Park Office working in the area are District Coordination Committee (DCC), Gaupalika, Nagarpalika, Education, Agriculture and Veterinary offices. These agencies are providing facilities and services as per their plan but still coordination is lacking to maximize the benefit to the buffer zone community from different organizations. On the other hand, the villages of buffer zone receive development inputs from several GO and I/NGOs.

11.7 Human Wildlife Conflict

Human and wildlife are most important and interrelated components of the natural environment. They have co-existed with least competition since time immemorial. However, nowadays humans have modified their habits and habitats drastically as a result there is competition for living spaces and resources between wildlife and them. In recent years the competition for survival has turned into conflict and has threatened to destroy the natural balance and right of wildlife to co-exist in many areas of Nepal (Giri and Shah, 1992). Wildlife related crop and livestock damage is emerging as a leading source of conflict between local communities, protected areas and park managers throughout India and the Himalayan regions (Kharel, 1997 and Mishra, 1997). The SNNP cannot exception the impact of growing human population and their growing desires which has consequently impacted wildlife habitats compelling wild animals to interfere with human affairs such as depredation of the crops and livestock. This conflict has negatively impacted the common to endangered species of wildlife, ultimately making biodiversity conservation a big challenge in the area. Wildlife related problems are specific to different areas, for example in Ichangu and Ramkot it is barking deer, sambar deer, wild boar, and porcupine are serious crop pests, while in Jitpur it is monkeys.

According to local respondents, main conflicts instigated by the wildlife against human in the area are:

- Crop raiding and trampling
- Livestock depredation and leaving behind and injuring
- Disturbances to humans by mauling and terrorizing through their presence

Although no human causalities due to wildlife attack reported in the area, but as complained by villagers of Nagarjun area monkey attack women and even they have developed tolerance against women and young children while guarding the crops in the field.

The main conflicts instigated by humans against the wildlife in the area are:

- Burning of forests to stop crop raiding by the wildlife.
- Killing wildlife for economic gain, to obtain meat, medicine and fur.
- Encroachment of wildlife habitats by extending agricultural land, habitat degradation by felling trees and removing vegetation from the forests
- Livestock grazing in the wildlife habitats.
- Disturbances simply due to their own presence.

11.8 Crop Damage

Local people of the area grow rice, wheat, finger millet, peas, potato, several seasonal vegetables and fruits in their fields. All the respondents have complained that there is regular crop damage by the wildlife with great variation in amount of the damage and responsible wildlife species from village to village. Wild boar, monkeys (mainly rhesus monkey), porcupine, Himalayan black bear and barking deer are said to be major crop raiders.

Most of the respondents had claimed that crop depredation increased due to damage of the core area's surrounding wall by the earthquake. Some opined that it is a normal tendency of the wild animals and it has been happening since long time. However, a few mentioned that it is due to lack of natural food items in the wild as a result of forest degradation and increment in their population. The overall crop raiding scenario is as follows.

- Monkeys, wild boar and porcupine are serious pest on maize and wheat crops
- Wild boar is serious pest on the crops everywhere.
- Himalayan black bear is mainly pest on maize and porcupine is serious pest on maize, yam, potato, cardamom, radish and alocasia *(Pindalu)*.
- Barking deer is pest on soybean (bhatmas).
- Masked palm civet- serious pest on maize.

The following factors are mainly responsible for the crop depredation by wildlife in the area.

- As a result of forest fire, and dry season no sufficient food is available in the natural habitats.
- In dry seasons greenery is only seen in the agricultural fields, and this with an abundance of food attracts the herbivore wildlife.
- In some areas, agricultural fields are not well protected through physical infrastructures.
- Crop season coincide with the time when wild animals have significantly greater energy demands in preparation for winter and nursing the young ones.

Crop fields are guarded especially during the peak time of the wildlife raids. Temporary guard houses are built within the agricultural lands and people spent day and night guarding the crops. Several methods such as beating of metallic utensils, tins, bells and making noises are used while guarding the crop fields. Scare crows are also installed at the vantage points of the farmland.

11.9 Livestock Depredation

As compared to crop depredation the area has fewer livestock depredation by the wild predators. The leopard is main culprit for cattle, sheep, goat and dog killing while Jackals and yellow throated marten are reported to steal local poultry. Livestock depredation by leopard is occasional while it occurs by

jackals throughout the year. Yellow throated marten is also serious pest on beehives traditionally kept in the houses. A few examples of livestock depredation in the area are as follows.

- This year a leopard lifting goats from the houses in Okhreni village.
- Yellow throated marten pest on poultry – only head is devoured!
- Leopard serious problem in Goldhunga and Jitpur area, this year 5 goats killed in the villages.

As stated by local inhabitants the primary causes of livestock predation by wildlife are:

- Poor guarding during day and night time. The livestock are freely released in the pasture as well as around the village.
- Weak and unhealthy livestock, also they can be easily killed than the wild ones.
- Shortage of food items pushes sheep and goats to reach predator's prime habitats, where they are easily attacked.

11.10 Major Issues

11.10.1 Increasing Human-Wildlife Conflict (HWC)

HWC has come up as one of the most serious issues in all consultation meetings. It is widespread but with different magnitude of damage particularly major crops like maize, millet, wheat and potato. The crop depredation by wild animals is identified as one of the major problems of SNNP (Kattel, 1993). Maize is found to be major crop preferred by wild animals followed by millet, wheat, and paddy in Okharpauwa and Bishnu VDCs (Suwal, 2009). It has been found that 50% of Gagalphedi and 87% of Sunkhani HHs have reported damage to maize (Shyaka, 2010). The farmers have abandoned more than 50% of agricultural land because of heavy crop depredation by monkey, porcupine, wild boar and barking deer. Himalayan black bear and Marble cat are also considered as problem animals to crops, cardamom and fruit in some areas. It seems that people are not aware of about Wildlife Damage Relief Support Guideline because only few claim for such support has been made to SNNP Office yet.

Often, it has been reported that goats are killed by leopard in the surrounding villages such as GhairiGau and Sundermai. Similarly, bear attack has been recorded from Okhreni. In rare cases, traps were used as a part of preventing pea crop damage from porcupine.

11.10.2 Poaching and illegal fishing

It is said that poaching has tremendously reduced in the area after the handover of 57/58 muzzle guns during insurgency period. Poaching of kalij pheasant by trapping and selling in the local market occurs occasionally. But it will be necessary to provide constant surveillance to the park for stopping prohibited activities in the area. One time people have been found using bleaching powder in streams for killing fishes.

11.10.3 Increasing conflict on resource use

Communities living by or inside the park are heavily or entirely dependent on park resources. There are no sufficient community forests and grazing areas in most of the units of buffer zone to meet the basic needs of firewood, fodder and grazing for livestock. No private forest exists in the area presently. Goat farming is the common practice in the area as a source of income. The practice of home-made liquor distillation for local consumption and selling is exerting more pressure on park resources. Haphazard road construction across the park has not only deforested but also has fragmented wildlife habitat and increased the risk of smuggling of forest products and poaching in the area.

11.10.4 Rising demands for water for drinking and irrigation

SNNP is known for fresh water and is the main source of water supply to Kathmandu, a metropolitan city. The local demands of water for drinking and irrigation purpose is increasing. Often, local people complain about not being able to get water adequately. A big construction of reservoir is underway at Dhap area for improving Bagmati river basin and retaining at optimal level of water flow in Bagmati in dry period. It may disturb wildlife in the surrounding a lot during construction phase.

11.10.5 Poor maintenance of boundary wall and fence

The erection of 111 km long and 1.2 to 1.8 m high stone wall in Shivapuri sector and 29 km brick wall in Nagarjun sector around the national park began in Fiscal Year 2038/039 B.S. to prevent wild animals going out to crop land and also to control illegal collection of forest resources such as firewood and fodder from the park. The wall got collapsed and broken by intruders at several places. It has almost become ineffective to stop wild animals moving out and people going to collect forest resources. No maintenance work of the wall has been done so far.

11.10.6 Enclaves inside the park

Four villages, namely, Mulkharka, Okhreni, Chilaune and Kunegaun are inside the park and are entirely dependent on park resources and there is no chance of developing community forest. It will increase more human-wildlife conflict with the increase in wildlife population and problem will be more severe and the people's life will be harsher in future. Voluntarily relocation of these villages will be the best option for park management and villagers once of all.

11.10.7 Ailani land (Unregistered land) and encroachment

There are Ailani lands (unregistered lands) at several places under different user committees. Those lands are either encroached or are illegally used for different purposes. It is reported that about 700 ropani of Ailani land in Sindhu-Shivapuri is left as barren and similar situation exists in other Committees (Goldhunga-Jeetpur). It is also reported that two community forest areas have been encroached under Ichangu-Narayan User Committee.

11.10.8 Forest fire

Forest fire is a common problem in some user committee like Baudeshwor, Bishnu-chapali, Sundarijal-Shivapuri, Manichud-Kageshwori, Goldhunga-Jitpur, kakani-okharpauwa but it is a little problem in Sindhu-Shivapuri User Committee. Similar situation may exist in other committees too.

11.10.9 Inadequate awareness

It is felt that buffer zone communities are less aware about their roles and responsibilities in managing natural, cultural resources, receiving benefits and institutionalizing community-based organizations from buffer zone programme. Somewhat, they are more concern about what they can get than what they can contribute. They were mostly expressing their grievance and hardship after the establishment of SNNP. It seems they are worried about that buffer zone will be managed as a national park with more restriction on resource use.

11.10.10 Early stage of buffer zone institutions

All leading positions in Management Committee and User Committee are led by males. Females are mostly in secondary and tertiary positions. The representation of female in leading position at User Group level, is little better but not satisfactory. Females occupy only 9% of the total User Group's

chairpersons. There is no female in Chairperson and Vice Chair postions of User Groups under Bishnu-Chapali, and Ramkot, Bhimdhunga and ChatreDeurali User Committees. The females are mostly in Treasurer (58%), Secretary (45%) and Vice Chair (35%) positions. The User Groups under Bishnu-Chapali User Committee have the highest number of female Secretary (86%) and Treasurer (71%) (Table 17).

Table 17: Female representation in key positions in BZUGs

No.	Name of User Committee	Number of UGs	Female Representation in Key Positions								Remark
			Chair		Vice Chair		Treasurer		Secretary		
			No	%	No	%	No	%	No	%	
1	Sundarijal-Shivapuri	42	4	10	10	24	23	55	19	45	About 58% treasurers are females and 45% secretary and 35% is Deputy Chair. Over 90% of UGs are led by males
2	Chisapani-Shivapuri	20	3	15	10	50	10	50	11	55	
3	Ichangu Narayan	33	4	12	17	52	21	64	19	58	
4	Kakani-Okharpauwa	27	2	7	6	22	16	59	10	37	
5	Bishnu-Chapali	7	0	0	2	29	5	71	6	86	
6	Gurge Bhanjang	25	4	16	9	36	13	52	16	64	
7	Ramkot, Bhimdhunga, Chhatra Deurali	16	0	0	5	21	11	69	6	38	
8	Manichud-Kageshwari	36	1	3	9	25	23	64	8	22	
9	Goldhunga-Jeetpur	40	4	10	15	38	30	75	12	30	
10	Sindhu-Shivapuri	18	0	0	8	44	4	22	5	28	
11	Boudeshwar Mahadev	32	4	13	13	41	17	53	10	31	
	Total	**296**	**26**	**9%**	**104**	**35%**	**173**	**58%**	**122**	**45%**	

11.10.11 Imbalance distribution of CFUGs under User Committees

It is found that there is imbalance distribution of community forests among User Committee which ultimately put more pressure on park resources unless some correction measures are not taken in time (Table 15). Also, there is just one LHF and one Religious Forest (23 ropani) in Goldhunga-Jitpurphedi UC in the entire buffer zone.

11.10.12 Limited funding

At present, SNNP has limited fund available for implementing buffer zone programme. The income of the park in fiscal year 2072/073 BS was Rs. 1,61,59847.00 and in F Y 2073/74 BS was 235,00000. The fifty percent of this amount is not sufficient to implement buffer zone programme as required. The income may increase but still it won't be adequate to support the programme as prescribed in the management plan.

11.10.13 Haphazard development of road network

Haphazard development of road network crossing SNNP and BZ has not only damaged natural environment, it has fragmented wildlife habitat, pollution in drinking water resources, lost chunk

of forests, increased vehicular movement and increased risk of poaching and illegal activities in the protected area.

11.11 Other Issues

There are a number of issues to be addressed in order to mainstream biodiversity conservation in buffer zone management. These are:

- Inadequate functional coordination between key actors of the buffer zone, including local level DCC, Gaupalika, Nagarpalika, line agencies and NGOs active in buffer zone
- The forest in buffer zone has patchy distribution, which is not able to meet the basic requirements of the people living around it
- Dependency of people on forest resources owing to poverty and lack of alternative livelihood options in the area
- Inadequate conservation awareness in general public
- Ineffective policy for regulating the land use of the area
- Rising Human-wildlife conflict due to increase in wildlife population in the park and increased population of human being
- High pressure on forest resources(timber, grass, firewood, medicinal plants, water, sand, stone, gravel, etc) due to growing population in buffer zone
- Uneven opportunities of tourism benefits in buffer zone
- New buffer zone institutions to cope numerous problems
- Promote stone wall reconstruction and biogas
- Integrate health issues in conservation
- Give priority for sanitation component to complement in achieving the goal of **Clean Bagmati and Bishnumati river.**
- Participatory management of the respective segment of Bagmati and Bishnumati by BZUCs to achieve the twin objective of river conservation and meeting local needs of clean drinking water.
- Community-based eco-tourism promotion, diversification, regulation and creating equal opportunity for all the users of BZ
- Identify the special area programme
- Strengthen community-based anti-poaching activities (Youth group as sub-committee of BZUC and networking of such group)
- Relocation of Sundarijal (Mulkharka, Okhreni, Kunegaun and Chilaune)
- Program should be focused on target groups
- Park revenue should increase through water utilization procedure
- Promotion of private forest development and conservation

11.12 Management Strategies

11.12.1 Zonation

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

11.12.2 Conservation Zone

The large forest patches in buffer zone is equally good as core area for wildlife and watershed management which also serve as biological corridor. Thus, these areas will be basically managed as extended wildlife habitat where extraction of forest products will be regulated but the area will be allowed for regulated tourism activities. The river segments of Bagmati and Bishnumati will also be managed as conservation zone.

11.12.3 Sustainable Use Zone

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

11.12.4 Intensive Use Zone

This is the area in the buffer zone, including all the settlements and private lands, where environment-friendly development activities will be carried out to enhance the livelihood of the people living in the area through various developmental inputs. The basic objective of this zone is to reduce the dependency of these people on forest resources and garner their support in conservation through conservation awareness. The area under this zone will be again prioritized based on severity of the interface problem, dependency of people on forest resources and wellbeing status of people. Based on this priority, the developmental inputs will be provided.

11.12.5 Regulation of forest products

The management and conservation of buffer zone forest resources is a matter of great concern. Increased demand of the forest resources right from the grass to timber is realized to be the major challenge in managing forest resources. As per the provision made in Buffer Zone Management Regulation, 1996, forests of buffer zone could be managed as buffer zone forest, buffer zone community forest, private forest or religious forest. Altogether, 54 community forests are already handed over to the respective user groups for management. The community forests are managed as per the approved operational plan. There is one religious forest and two leasehold forests also exist in buffer zone that were handed over before the declaration of the buffer zone.

Table 18: Community Forest (District-wise)

S. No.	Name of Districts	Number of CFs	Total Area of CFs (Ha.)	Number of HHs	Remarks
Community Forests					
1	Sindhupalchok	5	23.17	304	Some Users are from different Wards in case of few Community Forests
2	Dhading	2	12.65	62	
3	Kathmandu	30	482.29	2370	
4	Nuwakot	17	175.32	1929	
	Grand Total	**54**	**693.43**	**4665**	
Religious Forest					
1	OshoTapo Ban, Kathmandu	1	273.0	-	Of which, 37 ropani is Government Forest

Leasehold Forest					
1	Bajrayogini Tea Estate	1	100	-	30 Years lease for tea and medicinal plants production on commercial scale
2	Dharmasringa dhyan Kendra	1	0.7	-	30 Years lease

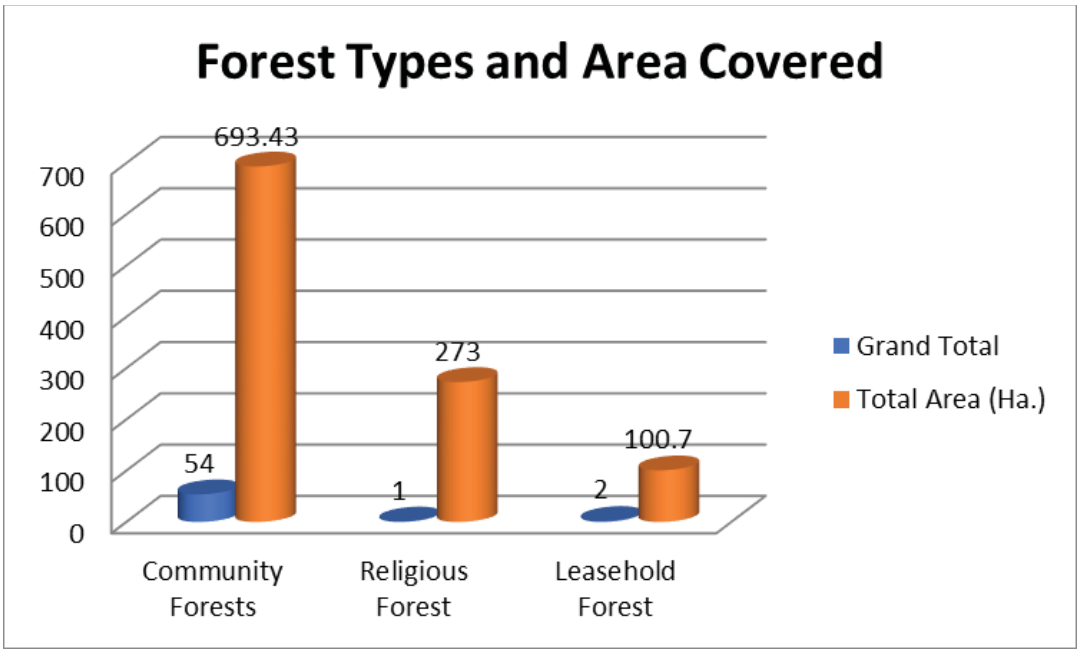


Figure 11: Forest Types and Area Covered

Table 19: Number of Community Forests under each User Committee

S. N.	Name of User Committee /District	Number of CF	Population covered by UGs
1	Sundarijal-Shivapuri, Kathmandu	9	4,869
2	Chisapani-Shivapuri, Nuwakot	1	5,680
3	Ichangu Narayan, Kathmandu	2	4,737
4	Kakani-Okharpauwa, Nuwakot	4	5,032
5	Bishnu-Chapali, Kathmanadu	4	2,552
6	GurjeBhanjang, Nuwakot	9	5,726
7	Ramkot, Bdhunga, Chhatra Deurali, Kathmandu/ Dhading	4	3,330
8	Manichud-Kageshwari, Kathmandu	10	6,795
9	Goldhunga-Jeetpur, Kathmandu	5	6,860
10	Sindhu-Shivapuri, Sindhupalchok	5	4,545
11	BoudeshwarMahadev, Kathmandu	1	6,510
	Total	**54**	**56,636**

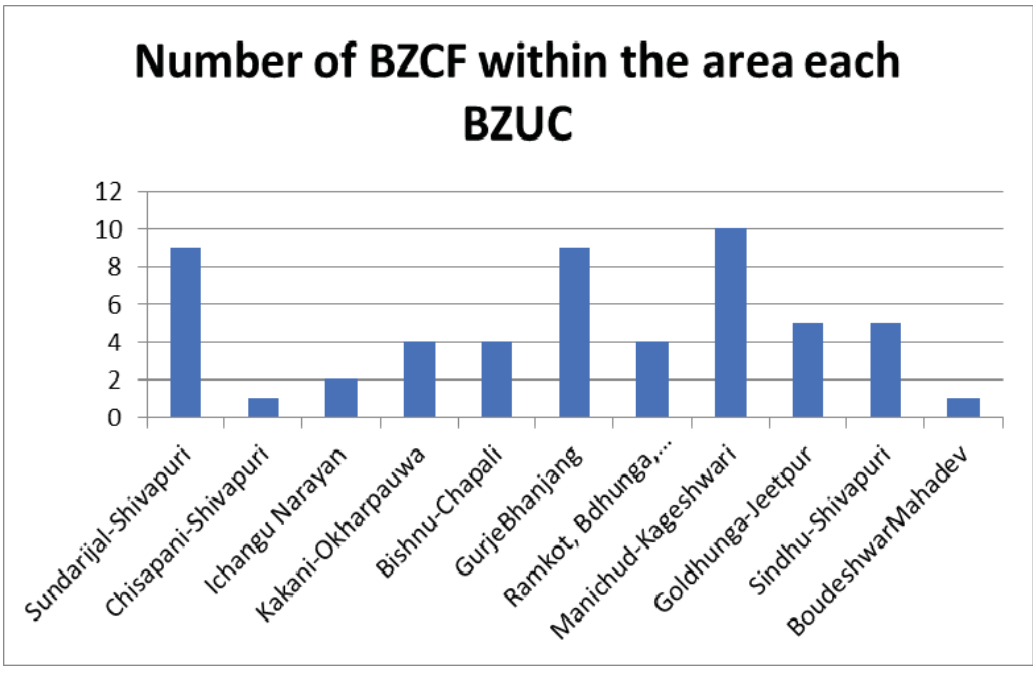


Figure 12: Number of Community Forests under each User Committee

The management responsibility of buffer zone forest rests with SNNP. Efforts should be made to handover other suitable forest patches to as buffer community forests and promote private forests in buffer zone in coming years. Local people residing in the buffer zone are provided with the permission to fell and use the trees grown up in their own registered private lands following certain process.

The regulation of river materials (sand, stone and gravel) excavation from the rivers and streams of park border and buffer zone is important for the following purpose:

- Conserve habitat of wetland dependent birds and other wildlife;
- Collect and transport river materials deposited unexpectedly in river bed and banks provided that the manner is environment friendly;
- Provide raw materials for buffer zone community development;
- Increase the government revenue by charging royalty on river materials;

The excavation and use of sand, stone and gravel in buffer zone is limited to buffer zone users in regulated way for the purpose other than commercial. Regulated excavation of such products from rivers is allowed to the buffer zone communities only after charging royalty. These excavation activities are prohibited in areas where it could in watershed and wetland. Besides this, the excavation is limited to certain months and allowed only in designated river sections. Excavation should be in small scale more closely to the existing annual quantity of permission (supply). The standards enshrined in the Environmental Protection Act, 2053, and Environment Protection Regulation, 2054, should be adhered to while executing the excavation related activities. Regular monitoring, supervision and relevant studies are necessary to take right decisions in this matter. In any case, transportation and use of sand, stone and gravel should not be extended outside the buffer zone. The use of mechanized equipment is not allowed. The total quantity of river materials (sand, stone and gravel) that can be collected from the rivers and streams of SNNP border and buffer zone for the period of five years (2017-2022) only for buffer zone communites house hold purpose such as building, toilets, shedhouse, biogas etc. is estimated as follows:

Table 20: Annual Estimated quantity of collectable river materials

SN	Item	Year I	Year II	Year III	Year IV	Year V
1.	Sand (Cu.m)	1,000	1100	1200	1300	1400
2.	Stone (Cu.m)	5,00	600	700	800	900
3.	Gravel (Cu.m)	5,00	600	700	800	900
	Total (Cu.m)	2,000	2300	2600	2900	3200

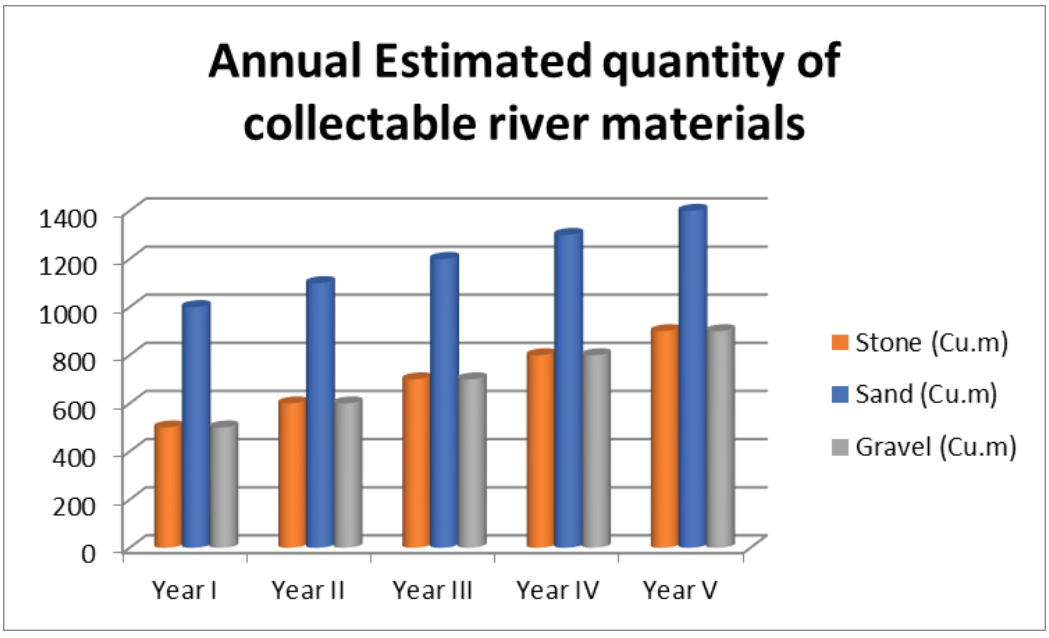


Figure 13: Annual Estimated quantity of collectable river materials

Implementation and Mainstreaming Strategy

For the effective implementation of the plan, all the programmes will be implemented through user committees. The basic implementation strategy will be

- Ensure participation of all stakeholders;
- Follow the good governance practices-maintain transparency and well-informed decision;
- Promote green development in buffer zone through organic farming, use of biogas, roadside plantation, watershed management, clean-up water sources and settlements and other green technology that reduces carbon footprint;
- Capacity building for institutional sustainability;

The mainstreaming strategies in buffer zone will include protection of wildlife, maintenance of wildlife habitats, regular monitoring of wildlife species, regulation of forest product collection and cattle grazing, human wildlife conflict minimization and paying compensation for any damage by wildlife. Tourism sector would include facilitating eco-tourism activities with active participation of villagers.

CHAPTER 12

Activity, Budget and Logical Framework

12.1 Activity and Budget

The budget required for the implementation of the activities prescribed by the plan for the period of five years is estimated and presented in detail in Annex XIII. The activities and budget of the management plan for Shivapuri Nagarjun National Park and buffer zone for the period of five years F.Y. 074/075-078/079 BS (2017 July -2022 June) is summarized as follows:

Table 21 : Activity and Budget for five years period

Budget in thousands, 000'

SN	Activates	Total Budget (NPR)	Amount					Remarks
			Year 1	Year 2	Year 3	Year 4	Year 5	
A	Park Management							
1	Infrastructure Construction/Maintenance and Facilities Improvement							
a	Building Construction/ Maintenance and Facilities Improvement	1,97,750	67,750	41,750	35,250	30,250	22,750	
b	Road/Trails/Boundary wall Construction and Improvement	19,000	3,800	3,800	3,800	3,800	3,800	
2	Habitat Management	16,550	3,650	4,050	3,650	2,750	2,450	
3	Species Conservation, Research and monitoring activities	7,350	1,900	750	1,850	1,050	1,800	
4	Strengthening Intelligence network and Anti-Poaching	5,200	2,000	800	800	800	800	
5	Human Wildlife Conflict	20,500	4,500	4,000	4,000	4,000	4,000	
6	Eco-Tourism Development	35,500	5,400	5,400	4,400	15,400	4900	
7	Conservation Awareness Programme	7,000	1,400	1,400	1,400	1,400	1,400	
8	Capacity Building	4,000	900	900	1,100	700	400	
9	Special Programmes	9,300	1,800	1,300	1,300	3,600	1,300	
10	Watershed and Wetland management	3,000	900	400	400	900	400	
11	Office Management Cost	2,61,500	56,700	53,700	53,700	48,700	48,700	
	Total =	**5,86,650**	**1,50,700**	**1,18,250**	**1,11,650**	**1,13,350**	**92,700**	

SN	Activates	Total Budget (NPR)	Amount					Remarks
			Year 1	Year 2	Year 3	Year 4	Year 5	
B	**Buffer Zone Management**							
1	Conservation Programme (15%)	41,250	9,190	7,740	8,520	7,520	8,280	
2	Human Wildlife conflict and Relief (25%)	68,750	15,640	15,380	15,100	11,500	11,130	
3	Community Development (15%)	41,250	25,550	3,750	4,950	4,050	2,950	
4	Eco tourism, income generation and skill development (20%)	5,500	16,050	8450	13,850	8,550	8,100	
5	Conservation Education(10%)	27,500	6,500	5,250	5,250	5,250	5,250	
6	Administrative cost (15%)	41,250	8,970	8,070	8,070	8,070	8,070	
	Total =	**2,75,000**	**81,900**	**48,640**	**55,740**	**44,940**	**43,780**	
	Grand Total (A+B)=	**8,61,650**	**2,32,600**	**1,66,890**	**1,67,390**	**1,58,290**	**1,36,480**	

Budget for park management

Total budget for park management cost is NRs. 586.65 million out of whicht NRs. 261.5 million is for office management. The budget for five consecutive fiscal year is NRS 150.7 million, NRs 118.25 million, NRs 111.65 million, NRs 113.35 million and NRs 92.7 million which is 25%, 20.16%, 19.04%, 19.33% and 16.47% respectively. (Table 21).

Table 22: Budget for park management

Budget in thousands, 000'

S. N.	Source of Budget	Allocated budget	office management cost	percent	park management cost	percent	Fiscal Year
1.	Government	63,244	40,160	63.5%	23,084	36.5%	073/074
2.	Government	97,978	45,859	46.80%	52,119	53.19%	074/075
Proposed Budget per year							
1.	Government	1,50,700	56,700	37.63%	94,000	62.37%	074/075
2.	Government	1,18,250	53,700	45.42%	64,550	54.58%	075/076
3.	Government	1,11,650	53,700	48.10%	57,950	51.90%	076/077
4.	Government	1,13,350	48,700	42.97%	64,650	57.03%	077/078
5.	Government	96,200	48,700	50.62%	47,500	49.37%	078/079
	Total	**5,86,650**	**2,61,500**	**44.57%**	**3,25,150**	**55.43%**	

Data shows that total allocated budget in the last fiscal year 073/074BS was NRs. 63.244 million. Out of that budget, office management cost was NRs. 40.16 million (63.50%) and NRs. 23.084 million (36.50%) for park management respectively.

There is a big gap between proposed and allocated budget for the park management and only 19.2 percent gaps in office management cost in this fiscal year. Trend of budget increment in each year is satisfactory in administration cost but not sufficient for the park management. We have to find out the funding sources to meet the goal of the management plan.

In the next fiscal year 075/076 BS, proposed budget NRs. 53.7 million is in office management cost and NRs. 64.55 million for park management, in total NRs. 118.25 million. (See Table 22) During the five fiscal years, more budgets have been proposed in the first two fiscal years for the construction of damaged infrastructures, buildings, boundary walls etc. by the earthquake. Lesser budgets are required year by year after completion of infrastructure construction.

Budget for Buffer zone Management

Allocated budget for administration cost is NRs. 41.25 million and NRs. 233.75 million for BZ management in total NRs. 275 million for five fiscal year. (See Table 22)

Table 23: Budget for Buffer zone management

Budget in thousands 000'

S.N.	Sources of budget	Expected amount per year	Percent	Remarks
1	Government			
	Revenue from tourist	8,000	12.93%	F Y 073/074
	Revenue from tourist	11,400	18.42%	F Y 074/75
	Revenue from other sources	15,000	24.24%	
2	Local level government	11,000	17.77%	1 million expected from each local government
3	Internal sources of UC	5,500	8.89%	5 million in each UC
4	Conservation supporting agencies	11,000	17.77%	1 million in each UC
	Total	**61,900**	**100%**	

There is a big gap between proposed and allocated budget for the buffer zone management. Trend of revenue increment in each year is satisfactory but not sufficient for the proposed budget. 25 to 30 percent additional budget will be allocated after approval of SNNP regulation. We can fulfill the gap of budget, 5 percent from own sources of user committee, 10 percent from the local government and remaining part from the supporting organizations.

12.2 Logical Framework Analysis

The logical framework of output for Shivapuri Nagarjun National Park and buffer zone for five years period F.Y. 074/075-078/079(2017-2022) is as follows:

Table 24: Logical framework and analysis

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk/ Assumption
Vision			
Well conserved biodiversity, water sources and watersheds in the Park and BZ for the wellbeing of local and national communities	Well managed watershed, supply of drinking water, diversity richness and status of endangered species	-MoFE reports - DNPWC and SNNP annual report -NGO/ International NGO's reports	Favorable Policy and priority of the country
Goal			
Conserve biodiversity, maintain natural ecosystems, improve watershed, hydrological functions, and enhance socio-economic and cultural values of SNNP and BZ	Conserved watershed and water sources for people's prosperity	-SNNP and DNPWC annual reports -Management effectiveness evaluation report	-Government emphasis and favorable policy -No large scale natural calamities like landslide, soil erosion, flood prevails
Objectives			
1. To protect, conserve and document biodiversity with special focus on nationally protected, globally threatened and locally valuable, endangered and endemic species, critical ecosystems, and diverse wildlife habitats.	-increased number of leopard and pangolin populations -Illegal felling of forest Significantly controlled by the end of 5 years -Sightings of endangered species become more frequent	-SNNP annual reports -Official and academic wildlife monitoring reports -Census reports -Media reports	-Sustainable anti-poaching and strengthened security situation -SNNP will have full strength of competent staff
2. To manage the representative terrestrial and aquatic wildlife habitats and assess periodically habitat to maintain ecological functions and processes of mid-mountain ecosystem.	- 1 % of park area is maintained as grassland by the end of 5 years -More than two third of existing wetlands well maintained -Alien and Invasive Species removed significantly -More than 2 research reports on invasive ecology and management methods prepared	-Observation records -Habitat diversity reports -Status survey reports	-Regulated river water pollution

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk/ Assumption
	-Invasive, fire mapping and wetland assessment map produced -Hazardous fire in park is controlled significantly - Increased wetland species number by 50 percent		
3. To manage watershed of Holy Rivers such as Bagmati and Bishnumati to improve water quality, hydrological functions and processes in perpetuity.	-Increased water quality and quantity, -Regulated river excavation and pollution -Degraded river habitats of Bagmati and Bishnumati is improved	- Observation records - Annual reports - Monitoring reports	-Local communities and tourism entrepreneurs provide continuous support
4. To regulate and promote sustainable eco-tourism retaining wilderness within the least acceptable change on natural environment and socio-cultural heritage of SNNP and buffer zone.	-Increased quality tourists by 30 % - more than 100 local youths are engaged in different services by the end of 5 years -Increased share of local products in tourist market by 50 percent -Development of 5 more new sites	-Tourist flow records and reports -Local production reports -Consumption survey reports	-Conservation-friendly tourism promotion
5. To enhance public participation in biodiversity conservation by raising awareness, and improving livelihoods and minimizing human-wildlife conflicts by initiating effective measures in collaboration with local communities and local level government agencies	-Reduced wildlife losses to 80% by the end of 5 years - Increased awareness among the 75 percent communities households - Established 5 home stay sites - Provide wildlife damage refief fund to more than 95% victims	-Incident and legal cases - Decrease Cases of relief/ compensation requests -BZ and SNNP reports	-fully implementation of BZ guidelines -Full implementation of relief guidelines -Community are unified and positive to cooperate -Partner organization keep supporting programme

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk/ Assumption
6. To strengthen institutional capacity of park, security and buffer zone through research and capacity building in collaboration with relevant agencies and organizations.	-Updated database -Increased joint venture activities, projects and programmes	-Research reports -HRD reports -Media reports -DNPWC reports, official records of correspondence -Stakeholders (DCC, Rural municipalities, Municipalities) reports -Monthly reports	Effective coordination, collaboration and networking with stakeholders
Outcome:1			
1.1. Increased clouded leopard, common leopard, pangolin, spiny babbler population and other fauna	Clouded leopard, pangolin, common leopard, spiny babbler numbers increased by 2022	-Census reports -Periodic research reports	Frequent sighting of major wildlife species
1.2. Controlled poaching of wildlife species	Reduced or zero poaching of leopard and pangolin by 2022	-FM and newspaper media reports -SNNP monthly, quarterly and annual reports	Effective anti-poaching and wildlife crime control bureaus
1.3. Updated status of globally threatened avifauna, herpeto-fauna, fishes and mammals	Updated statusof Clouded leopard, pangolin, common leopard and spiny babbler by 2022	Database report	Availability of trained human resources
Outcomes: 2			
2.1. Maintained grassland area with desired quality	-Uprooted unpalatable tree species from grasslands -280 ha of grasslands maintained well	-Observation record -SNNP and DNPWC annual reports -Vegetation survey and habitat management reports	
2.2. Enhanced quality of key wetland sites and maintain the area	-Enhanced quality and area of 30 wetland sites -22 water holes constructed and renovated	Observation record and annual reports	Collaboration with agencies, KUKL, Water User Groups

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk/ Assumption
2.3. Improved water quality by reduced pollution and exploitation	-Water quality assessed and maintained before and after use	-Water quality assessment reports -Annual and periodic water quantity measurement	Better drinking water availability options for BZ and downstream communities Inter-ministerial coordination for river related programme
Outcome:3			
3.1. Reduced negative effects of tourism on park	Reduced non-recyclable garbage and noise inside the park -Regulated entry and visitor number	-Observation -Health and hygiene	Minimum/ restricted use of non-recyclable and non-biodegradable at periphery
3.2. Maintained wilderness	-Wildlife sightings increased -Reduced human disturbances in the sensitive park area	Scenery and *in-situ*observation	Minimum human interferences in park core areas
3.3. Conserved indigenous cultural heritage of the area	Maintained 10 cultural sites	Tamang cultural museums and local festive	Volunteer heritage conservation supports by the communities
3.4. Shared benefit to locals by increasing income and employment opportunities	Increased income and improved living standard 50 percent by 2022	Household survey and BZ reports	Efficient benefit sharing mechanism
3.4. Increased number of foreign tourists	Increased 50 percent by 2022	-Nepal Tourism Board reports -HAN, TAN reports	Availability of quality tourist facilities and services
Outcome: 4			
4.1. Raised awareness level and concerns of local communities and institutions	-Celebrated 25 green days -Conducted more than 100 Conservation awareness based programmes in BZ's School	Activity reports	Active peoples' participation
4.2. Developed physical infrastructure in BZ	Roads, drinking water, school, bridges, biogas plants, irrigation canals and community halls constructed	-Annual reports, -Buffer zone and Rural municipalities and municipalities reports	People's active participation

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk/ Assumption
4.3. Reduced number of human-wildlife conflict cases	Reduced conflicts 80 percent by 2022 50% boundary wall be renovated	Case and field reports	-Delimitation of relief guidelines for crop and property losses -Increased human casualty relief amount
4.4. Increased income and park- friendly livelihood options provided to the BZ communities	Increased income and livelihood opportunities by 50 percent	Socio-economic survey reports	Adoption of livelihood options
Outcome: 5			
5.1. Research activities prioritized, coordinated and the findings incorporated in management	Research priority in place	Research and annual reports	Priority of research wings and donors
5.2. Enhanced the technical and managerial skills of staffs and stakeholders	50 capacity building trainings Conducted	-HRD reports -Periodic performance evaluation	Park favorable deployment and transfer
5.3. Strengthened biological corridor cooperation District forest offices and others PAs office	Regular communication and interactions (Twice a year) with DFO's and PAs Office	-Correspondence records -Personal communications -Meeting reports	Provision of guidelines and frameworks
5.4. Developed networks, partnership and strengthened collaboration and coordination with stakeholders	Increased partners and collaborators by 75 percent	-Newsletters and brochures -Media reports and newspaper	Provision of guidelines and frameworks
5.5. Developed Information management system using recent technology	Real time patrolling system fully operational in all 32 posts	Real time maps and reports	Compatible GPS and software

Activities	Remarks
1. To protect, conserve and documentation of biodiversity with special focus on nationally protected and globally threatened and locally valuable rare and endemic species, communities, ecosystems, and diverse habitats of wildlife species;	

Activities	Remarks
1.1 Construct or upgrade guard posts, view towers (*Machan*), all weather roads and fireline/seasonal roads 1.2 Strengthen intelligence network and information system to control poaching and other wildlife crime 1.3 Regular surveillance through improved mobility and real time patrolling 1.4 Regular status assessment of key protected species (clouded leopard, pangolin, leopard cat, Assamese monkey) 1.5 Prepare checklist of mammals, herpeto-fauna, avi-fauna, fishes and insects 1.6 Capacity building of park authorities and protection unit 1.7 Coordination and collaboration with national and international partners 1.8 Sustainable revenue generation for sustainable protection	
2. To manage the representative terrestrial and aquatic wildlife habitat and assess habitat status to maintain ecological functions and processes of mid-mountain ecosystem. 2.1 Identification and management of key grasslands 2.2 Identification and management of wetlands 2.3 Fire management (fire line maintenance), early and rotational burning, community participation in fire control 2.4 Initiate baseline studies on climate change impacts on habitats	
3. To manage watershed of Holy rivers Bagmati and Bishnumati and other wetlands to maintain and improve of water sources and hydrological functions and process; 3.1 Water quality assessment and water recharge 3.2 Identification and management of key wetland sites (regular weed removal, recharge during stress period, water quality assessment)	
4. Regulate and promote sustainable eco-tourism maintaining wilderness and cultural heritage 4.1 Access and facilities improvement (fire lines, roads/trails, view towers) 4.2 Develop walk trails 4.3 Develop eco-tourism guidelines: define the design, color, structures of infrastructures and review and update entry fee and validity of entry ticket 4.4 Sanitation and solid waste management 4.5 Categorize hotel and standardize their services 4.6 Promote home stay and agro-tourism: link local organic vegetables, fruits, mushroom, honey, spices, dairy products 4.7 Develop and empowerment of nature guides 4.8 Develop park information and interpretation centers: Sundarijal Centre, Panimuhan, Fulbari 4.9 Provision of e-ticketing and publicity of the park: (update leaflet and brochures regularly and produce tourist information maps) 4.10 Conserve and promote local cultural heritage: Tamang culture by enhancing their crafts and arts (promote effective home stay)	

Activities	Remarks
5. Enhance public stewardship on biodiversity conservation by increasing awareness, minimizing human-wildlife conflicts and improving livelihood of people (buffer zone management) 5.1 Boundary wall fencing and live fencing making 5.2 Immediate relief and compensation of wildlife damage; quick and easy 5.3 Strengthening of local institutions 5.4 Conservation education programmes in schools 5.5 Awareness raising activities: workshops, interactions, discussion, documentary, exposure visit, radio, audio-visuals, special day celebration, wildlife week, pamphlets and leaflets distribution, activity reports 5.6 Income generation activities: vegetables, fruits, poultry, piggery, milk cattle and buffalo 5.7 Livelihood improvement through skill development: handicraft, computer, electric wiring, beauty parlour, mobile and motor bike repair maintenance 5.8 Roads and infrastructures: road gravelling, maintenance and construction of school and community organization multi-purpose (BZCF, DCC, Gaupalika, Nagarpalika, BZUC) buildings, bridges 5.9 Improvement of irrigation facilities: irrigation canals, bridge and culvert construction and maintenance 5.10 Coordination and collaboration: DLSO, DCC, BZMC, for establish and support of Livestock Service Centres 5.11 Promotion of BZ CFs: BZ forest registration, handover and management, BZCF habitat management and eco-tourism operation (in collaboration with different stakeholders and conservation support organizations, BZMC and Gaupalika/Municipalities) 5.12 Regulate and monitor construction materials excavation and clarify the tax: SNNP, BZUCs and BZCFs previously as of DCCs	
6. Institutional strengthening through research, capacity building, coordination and collaboration 6.1 Monitoring of key wildlife species: leopard monitoring by camera trapping, Spiny babbler monitoring using GPS and use of satellite telemetry in wildlife monitoring. 6.2 Census of threatened wildlife species: Clouded leopard, common leopard 6.3 Status survey of protected birds and wildlife: Spiny babbler, leopard cat, Assamese monkey 6.4 Research on wildlife, habitat and human dimensions of management: DNA/genetic test of leopard, pangolin, Himalayan black bear, climate change 6.5 Investigation and follow up of catastrophic deaths and disease surveillance	

Activities	Remarks
6.6 Capacity enhancement trainings: Real time, GPS, GIS, computer operation, APPA/ZOPP, wildlife handlings techniques library management biodiversity documentation trainings and academic courses in different international institute 6.7 Coordination and collaboration: local/district level meetings on monthly/tri-monthly/annual basis, collaboration with other conservation institutions and organizations 6.8 Biological corridor in landscape level meetings and workshops with District forests offices and protected areas office.	

12.3 Gender Equity and Social Inclusion

Women and indigenous communities are playing vital roles in biodiversity conservation and resource management from the beginning of conservation history of Nepal. However, they are facing problems to exercise their practices, negative impact of disasters and associated impact of climate change as their livelihood is heavily dependent on resource base and hardly reaping benefits of biodiversity conservation and management of natural resources. Thus, gender and social inclusion (GESI) has been emerging issues in the biodiversity conservation and green enterprise development as they are the primary users, contributors and sufferers of resource degradation.

GESI is one of the cross-cutting issues in devising management plan of PA's. Updating and analyzing information on park management, review relevant policies and legislations, capacity assessment and present management practices have been made through GESI perspective and major findings are presented in respective sections of the plan. Based on the findings and information, GESI perspective has been integrated in strategic components of the plan, result framework, and component plans including issues, strategies, activities and budget.

The plan has proposed to assign specific roles, address practical and strategic needs of women and other DAG and indigenous communities, respect their rights and strengthen their capacities both in conservation and livelihood and develop strategies for fair and equitable benefits to them. It also has focused on women and DAG while hiring staff for the park and BZ institutions, providing conservation education, trainings, orientations, other alternative livelihood options, research activities and database management, ensuring their engagement in BZ and other local institutions including holding major portfolios and having their say in decisions affecting them for responding GESI perspective.

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Annexes

ANNEX 1

Mammal of Shivapuri Nagarjun National Park

No.	Scientific Name	Common Name	Means of verification
1.	*Lepus nigricollis*	Indian Hare	Observation
2.	*Dremomys lokriah*	Orange-bellied Himalayan Squirrel	Observation
3.	*Petaurista petaurista*	Red Giant Flying Squirrel	Observation
4.	*Vandeleuria oleracea*	Asiatic Long-tailed climbing Mouse	Observation
5.	*Rattus sp.*	Rat species	Interview
6.	*Muss sp.*	Mouse species	Interview
7.	*Hystrix indica*	Crested Porcupine	Photo./Lit. & Inter.
8.	*Manis pentadactyla*	Chinese Pangolin	Observation/inteview
9.	*Paguma larvata*	Masked Palm Civet	Photograph/interview
10.	*Vivera zibetha*	Large Indian Palm Civet	Photograph/interview
11.	*Felis chaus*	Jungle Cat	Photograph/ interview
12.	*Prionailurus bengalensis*	Leopard Cat	
13.	*Neofelis nebulosa*	Clouded Leopard	Photograph/ interview
14.	*Panthera pardus*	Common Leopard	photo./Lit. & Signs.
15.	*Herpesters auropunctatus*	Small Indian Mongoose	Observation
16.	*Herpestes urva*	Crab-eating Mongoose	Lit./Photograph
17.	*Canis aureus*	Asiatic Golden Jackal	Observation
18.	*Ursus thibetanus*	Himalayan Black Bear	Literatur/Interview
19.	*Lutra lutra*	Eurasian Otter	Interview
20.	*Martes flavigula*	Yellow-throated Marten	Observation
21.	*Shrew spp.*	Shrews	Interview
22.	*Bat spp.*	Bats	Observation
23.	*Semnopithecus schistaceus*	Nepal Langur	Lit. & Inter.
24.	*Macaca mulatta*	Rhesus Macaque	Observation
25.	*Macaca assamensis*	Assamese monkey	Observed
26.	*Muntiacus vaginalis*	Barking Deer	Observation
27.	*Rusa unicolor*	Sambar Deer	Antlers observed
28.	*Naemorhedus goral*	Common Goral	Lit. & Inter.
29.	*Capricornis thar*	Himalayan Serow	Photograph/interview
30.	*Sus scrofa*	Wild Boar	Signs/Interview

ANNEX 2

Birds of Shivapuri Nagarjun National Park

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
	GALLIFORMES			
	Phasianidae			
1	Chukar	*Alectoris chukar*	r5	
2	Black Francolin	*Francolinus francolinus*	r4	
3	Hill Partridge	*Arborophila torqueola*	r1	
4	Kalij Pheasant	*Lophura leucomelanos*	r1	
	TURNIpCIFORMES			
	Turnicidae			
5	Barred Buttonquail	*Turnix suscitator*	r3	
	Picidae			
6	Eurasian Wryneck	*Jynx torquilla*	w3	
7	Speckled Piculet	*Picumnus innominatus*	r3	
8	Rufous Woodpecker	*Celeus brachyurus*	r3	
9	Bay Woodpecker	*Blythipicus pyrrhotis*	r3	
10	Brown-fronted Woodpecker	*Dendrocopos auriceps*	r3	
11	Fulvous-breasted Woodpecker	*Dendrocopos macei*	r2	
12	Rufous-bellied Woodpecker	*Dendrocopos hyperythrus*	r2	
13	Crimson-breasted Woodpecker	*Dendrocopos cathpharius*	r3	
14	Darjeeling Woodpecker	*Dendrocopos darjellensis*	r3	
15	Lesser Yellownape	*Picus chlorolophus*	r2	
16	Greater Yellownape	*Picus flavinucha*	r3	
	Megalaimidae			
17	Great Barbet	*Megalaima virens*	r2	
18	Golden-throated Barbet	*Megalaima franklinii*	r3	
19	Blue-throated Barbet	*Megalaima asiatica*	r2	
	UPUIFORMES			
	Upupdae			
20	Common Hoopoe	*Upupa epops*	m3	
	CORACIIFORMES			
	Alcedinidae			
21	Common Kingfisher	*Alcedo atthis*	r2	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
	Dacelonidae			
22	White-throated Kingfisher	*Halcyon smyrnensis*	r2	
	Meropidae			
23	Blue-bearded Bee-eater	*Nyctyornis athertoni*	r5	
24	Chestnut-headed Bee-eater	*Merops leschenaulti*	s3	
	CUCULIFORMES			
	Cuculidae			
25	Pied Cuckoo	*Clamator jacobinus*	s5	
26	Chestnut-winged Cuckoo	*Clamator coromandus*	s5	
27	Large Hawk Cuckoo	*Hierococcyx sparverioides*	s3	
28	Common Hawk Cuckoo	*Hierococcyx varius*	s4	
29	Indian Cuckoo	*Cuculus micropterus*	s4	
30	Eurasian Cuckoo	*Cuculus canorus*	s2	
31	Himalayan Cuckoo	*Cuculus saturatus*	s3	
32	Lesser Cuckoo	*Cuculus poliocephalus*	s2	
33	Banded Bay Cuckoo	*Cacomantis sonneratii*	s4	
34	Grey-bellied Cuckoo	*Cacomantis passerinus*	s4	
35	Plaintive Cuckoo	*Cacomantis merulinus*	s4	
36	Drongo Cuckoo	*Surniculus lugubris*	s4	
37	Asian Koel	*Eudynamys scolopacea*	r3	
38	Green-billed Malkoha	*Phaenicophaeus tristis*	r3	
	PSITTACIFORMES			
	Psittacidae			
39	Rose-ringed Parakeet	*Psittacula krameri*	r4	
40	Slaty-headed Parakeet	*Psittacula himalayana*	r5	
	APODIFORMES			
	Apodidae			
41	Himalayan Swiftlet	*Collocalia brevirostris*	w3	
42	White-throated Needletail	*Hirundapus caudacutus*	w4	
43	Alpine Swift	*Tachymarptis melba*	w3	
44	Fork-tailed Swift	*Apus pacificus*	w3	
45	House Swift	*Apus affinis*	r1	
	STRIGIFORMES			
	Strigidae			
46	Mountain Scops Owl	*Otus sunia*	r3	
47	Eurasian Eagle Owl	*Bubo bubo*	r3	
48	Spot-bellied Eagle Owl	*Bubo nepalensis*	E N r5	
49	Brown Wood Owl	*Strix leptogrammica*	r3	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
50	Collared Owlet	*Glaucidium brodiei*	r2	
51	Asian Barred Owlet	*Glaucidium cuculoides*	r3	
52	Spotted Owlet	*Athene brama*	r2	
	Caprimulgidea			
53	Grey Nightjar	*Caprimulgus indicus*	r4	
54	Large-tailed Nightjar	*Caprimulgus macrurus*	w4	
	COLUMBIFORMES			
	Columbdae			
55	Rock Pigeon	*Columba livia*	r2	
56	Speckled Wood Pigeon	*Columba hodgsonii*	r3	
57	Ashy Wood Pigeon	*Columba pulchricollis*	r3	
58	Oriental Turtle Dove	*Streptopelia orientalis*	r3	
59	Spotted Dove	*Streptopelia chinensis*	r2	
60	Eurasian Collared Dove	*Streptopelia decaocto*	r3	
61	Barred Cockoo Dove	*Macropygia unchall*	VU r4	
62	Wedge-tailed Green Pigeon	*Treron sphenura*	r3	
	GRUIFORMES			
	Scolopacidae			
63	Eurasian Woodcock	*Scolopax rusticola*	s3	
64	Solitary Snipe	*Gallinago solitaria*	r4	
65	Common Snipe	*Gallinago gallinago*	r2	
66	Green Sandpiper	*Tringa ochropus*	w3	
	Accipitridae			
67	Black Kite	*Milvus migrans*	r2	
68	Lammergeier	*Gypaetus barbatus*	?w5	
69	Egyptian Vulture	*Neophron percnopterus*	r4	
70	White-rumped Vulture	*Gyps bengalensis*	CR m4	
71	Himalayan Griffon	*Gyps himalayensis*	w3	
72	Eurasian Griffon	Gyps fulvus	w3	
73	Cinereous Vulture	*Aegypius monachus*	w4	
74	Crested Serpent Eagle	*Spilornis cheela*	r2	
75	Black Eagle	*Ictinaetus malayensis*	r3	
76	Hen Harrier	*Circus cyaneus*	w4	
77	Montagu's Harrier	*Circus pygargus*	?	
78	Shikra	*Accipiter badius*	r3	
79	Besra	*Accipiter virgatus*	r4	
80	Eurasian Sparrowhawk	*Accipiter nisus*	w3	
81	Northern Goshawk	*Accipiter gentilis*	w4	
82	Common Buzzard	*Buteo buteo*	w3	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
83	Long-legged Buzzard	*Buteo rufinus*	w4	
84	Upland Buzzard	*Buteo hemilasius*	w4	
85	Greater Spotted Eagle	*Aquila clanga*	ENw4	
86	Golden Eagle	*Aquila chrysaetos*	v	
87	Steppe Eagle	*Aquila nipalensis*	w2	
88	Bonelli's Eagle	*Hieraaetus fasciatus*	m5	
89	Booted Eagle	*Hieraaetus pennatus*	w3	
90	Mountain Hawk Eagle	*Spizaetus nipalensis*	r3	
	Falconidae			
91	Lesser Kestrel	*Falco naumanni*	w5	
92	Common Kestrel	*Falco tinnunculus*	r3	
93	Amur Falcon	*Falco amurensis*	w4	
94	Eurasian Hobby	*Falco subbuteo*	r4	
95	Oriental Hobby	*Falco severus*	CR r5	
96	Saker Falcon	*Falco cherrug*	w5	
97	Peregrine Falcon	*Falco peregrinus*	r4	
	Ardeidae			
98	Cattle Egret	*Bubulcus ibis*	r1	
99	Indian Pond Heron	*Ardeola grayii*	r1	
	PASSERIFORMES			
	Eurylaimidae			
100	Long-tailed Broadbill	Psarisomus dalhousiae	VU r5	
	Irenidae			
101	Orange-bellied Leafbird	*Chloropsis hardwickii*	r2	
	Laniidae			
102	Brown Shrike	*Lanius cristatus*	w2	
103	Long-tailed Shrike	*Lanius schach*	r2	
104	Grey-backed Shrike	*Lanius tephronotus*	r3	
	Corvidae			
105	Eurasian Jay	*Garrulus glandarius*	r3	
106	Black-headed Jay	*Garrulus lanceolatus*	r4	
107	Yellow-billed Blue Magpie	*Urocissa flavirostris*	r5	
108	Red-billed Blue Magpie	*Urocissa erythrorhyncha*	r1	
109	Common Green Magpie	Cissa chinensis	?	
110	Rufous Treepie	*Dendrocitta vagabunda*	r3	
111	Grey Treepie	*Dendrocitta formosae*	r1	
112	Spotted Nutcracker	*Nucifraga caryocatactes*	r4	
113	House Crow	*Corvus splendens*	r1	
114	Large-billed Crow	*Corvus macrorhynchos*	r1	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
115	Indian Golden Oriole	Oriolus Kundoo	s3	
116	Maroon Oriole	*Oriolus traillii*	r2	
117	Large Cuckooshrike	*Coracina macei*	r2	
118	Black-winged Cuckooshrike	*Coracina melaschistos*	r3	
119	Grey-chinned Minivet	*Pericrocotus solaris*	r4	
120	Long-tailed Minivet	*Pericrocotus ethologus*	r2	
121	Short-billed Minivet	*Pericrocotus brevirostris*	r4	
122	Scarlet Minivet	*Pericrocotus flammeus*	r1	
123	Bar-winged Flycatcher-shrike	*Hemipus picatus*	r3	
124	Yellow-bellied Fantail	*Rhipidura hypoxantha*	r2	
125	White-throated Fantail	*Rhipidura albicollis*	r3	
126	Black Drongo	*Dicrurus macrocercus*	r1	
127	Ashy Drongo	*Dicrurus leucophaeus*	r3	
128	Bronzed Drongo	*Dicrurus aeneus*	r3	
129	Lesser Racket-tailed Drongo	*Dicrurus remifer*	r3	
130	Spangled Drongo	*Dicrurus hottentottus*	r4	
131	Asian Paradise Flycatcher	*Terpsiphone paradisi*	s4	
	Cinclidae			
132	Brown Dipper	*Cinclus pallasii*	r4	
	Turdidae			
133	Isabelline Wheatear	*Oenanthe isabellina*		
	Muscicapidae			
134	Blue-capped Rock Thrush	*Monticola cinclorhynchus*	s3	
135	Chestnut-bellied Rock Thrush	*Monticola rufiventris*	r3	
136	Blue Rock Thrush	*Monticola solitarius*	s3	
137	Blue Whistling Thrush	*Myophonus caeruleus*	r1	
138	Pied Thrush	*Zoothera wardii*	w4	
139	Orange-headed Thrush	*Zoothera citrina*	s4	
140	Plain-backed Thrush	*Zoothera mollissima*	w4	
141	Long-tailed Thrush	*Zoothera dixoni*	w4	
142	Scaly Thrush	*Zoothera dauma*	w3	
143	Long-billed Thrush	*Zoothera monticola*	VU w4	
144	Tickell's Thrush	*Turdus unicolor*	s3	
145	White-collared Blackbird	*Turdus albocinctus*	w2	
146	Grey-winged Blackbird	*Turdus boulboul*	r2	
147	Chestnut Thrush	*Turdus rubrocanus*	w5	
148	Dark-throated Thrush	*Turdus ruficollis*	w2	
149	Dark-sided Flycatcher	*Muscicapa sibirica*	s1	
150	Rusty-tailed Flycatcher	*Muscicapa ruficauda*	s3	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
151	Ferruginous Flycatcher	*Muscicapa ferruginea*	s4	
152	Slaty-backed Flycatcher	*Ficedula hodgsonii*	r2	
153	Rufous-gorgeted Flycatcher	*Ficedula strophiata*	r2	
154	Taiga Flycatcher	*Ficedula albiculla*	r3	
155	Kashmir Flycatcher	*Ficedula subrubra*	?	
156	White-gorgeted Flycatcher	*Ficedula monileger*	VU ?	
157	Snowy-browed Flycatcher	*Ficedula hyperythra*	s3	
158	Little Pied Flycatcher	*Ficedula westermanni*	s3	
159	Ultramarine Flycatcher	*Ficedula superciliaris*	r2	
160	Slaty-blue Flycatcher	*Ficedula tricolor*	r3	
161	Verditer Flycatcher	*Eumyias thalassina*	r2	
162	Grey-headed Canary Flycatcher	*Culicicapa ceylonensis*	r1	
163	Large Niltava	*Niltava grandis*	r5	
164	Small Niltava	*Niltava macgrigoriae*	r2	
165	Rufous-bellied Niltava	*Niltava sundara*	r2	
166	Blue-throated Flycatcher	*Cyornis rubeculoides*	r2	
167	Hill Blue Flycatcher	*Cyornis banyumas*	VUr4	
168	Pygmy Blue Flycatcher	*Muscicapella hodgsoni*	VU ?	
169	White-browed Shortwing	*Brachypteryx montana*	w5	
170	Indian Blue Robin	*Luscinia brunnea*	s2	
171	Himalayan Bluetail	*Tarsiger cyanurus*	w2	
172	Golden Bush Robin	*Tarsiger chrysaeus*	w3	
173	White-browed Bush Robin	*Tarsiger indicus*	w3	
174	Oriental Magpie Robin	*Copsychus saularis*	r1	
175	Blue-capped Redstart	*Phoenicurus coeruleocephalus*	w4	
176	Black Redstart	*Phoenicurus ochruros*	w3	
177	Hodgson's Redstart	*Phoenicurus hodgsoni*	w3	
178	Blue-fronted Redstart	*Phoenicurus frontalis*	w2	
179	White-capped Water Redstart	*Chaimarrornis leucocephalus*	r2	
180	Plumbeous Water Redstart	*Rhyacornis fuliginosus*	r2	
181	White-bellied Redstart	*Hodgsonius phaenicuroides*	w4	
182	White-tailed Robin	*Myiomela leucura*	r3	
183	Little Forktail	*Enicurus scouleri*	r3	
184	Black-backed Forktail	*Enicurus immaculatus*	?	
185	Slaty-backed Forktail	*Enicurus schistaceus*	r3	
186	Spotted Forktail	*Enicurus maculatus*	r3	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
187	Purple Cochoa	*Cochoa purpurea*	VU r5	
188	Hodgson's Bushchat	*Saxicola insignis*	EN m5	
189	Common Stonechat	*Saxicola torquata*	r1	
190	Pied Bushchat	*Saxicola caprata*	r2	
191	Grey Bushchat	*Saxicola ferrea*	r3	
	Stuenidae			
192	Common Myna	*Acridotheres tristis*	r1	
193	Jungle Myna	*Acridotheres fuscus*	r2	
	Sittidae			
194	Chestnut-bellied Nuthatch	*Sitta castanea*	r2	
195	White-tailed Nuthatch	*Sitta himalayensis*	r1	
196	Velvet-fronted Nuthatch	*Sitta frontalis*	r2	
197	Wallcreeper	*Tichodroma muraria*	w4	
	Certhiidae			
198	Rusty-flanked Tree-creeper	*Certhia nipalensis*	r4	
199	Brown-throated Tree-creeper	*Certhia discolor*	r3	
200	Winter Wren	*Troglodytes troglodytes*	w2	
	Paridae			
201	Fire-capped Tit	*Cephalopyrus flammiceps*	r5	
202	Coal Tit	*Parus ater*	r4	
203	Great Tit	*Parus major*	r1	
204	Green-backed Tit	*Parus monticolus*	r1	
205	Black-lored Tit	*Parus xanthogenys*	r1	
206	Yellow-browed Tit	*Sylviparus modestus*	r3	
	Aegithalidae			
207	Black-throated Tit	*Aegithalos concinnus*	r1	
	Hirundinidae			
208	Plain Martin	*Riparia paludicola*	r2	
209	Eurasian Crag Martin	*Hirundo rupestris*	w4	
210	Barn Swallow	*Hirundo rustica*	r3	
211	Red-rumped Swallow	*Hirundo daurica*	r3	
212	Northern House Martin	*Delichon urbica*	w3	
213	Nepal House Martin	*Delichon nipalensis*	w4	
	Regulidae			
214	Goldcrest	*Regulus regulus*	w3	
	Pycnonotidae			
215	Striated Bulbul	*Pycnonotus striatus*	r4	
216	Black-crested Bulbul	*Pycnonotus melanicterus*	r4	
217	Himalayan Bulbul	*Pycnonotus leucogenys*	r2	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
218	Red-vented Bulbul	*Pycnonotus cafer*	r1	
219	Mountain Bulbul	*Hypsipetes mcclellandii*	r2	
220	Black Bulbul	*Hypsipetes leucocephalus*	r1	
	Cicticolidae			
221	Striated Prinia	*Prinia criniger*	r2	
	Zosteropidae			
222	Oriental White-eye	*Zosterops palpebrosus*	r2	
	Sylviidae			
223	Chestnut-headed Tesia	*Tesia castaneocoronata*	r3	
224	Grey-bellied Tesia	*Tesia cyaniventer*	r3	
225	Common Tailorbird	*Orthotomus sutorius*	r2	
226	Aberrant Bush Warbler	*Cettia flavolivacea*	w3	
227	Hume's Bush Warbler	*Cettia acanthizoides*	w4	
228	Grey-sided Bush Warbler	*Cettia brunnifrons*	w3	
229	Blyth's Reed Warbler	*Acrocephalus dumetorum*	w3	
230	Dusky Warbler	*Phylloscopus fuscatus*	w4	
231	Tickell's Leaf Warbler	*Phylloscopus affinis*	w3	
232	Western Crowned Warbler	*Phylloscopus occipitalis*	w5	
233	Blyth's Leaf Warbler	*Phylloscopus reguloides*	w2	
234	Buff-barred Warbler	*Phylloscopus pulcher*	w1	
235	Ashy-throated Warbler	*Phylloscopus maculipennis*	r3	
236	Lemon-rumped Warbler	*Phylloscopus chloronotus*	w2	
237	Yellow-browed Warbler	*Phylloscopus inornatus*	w3	
238	Hume's Warbler	*Phylloscopus humei*	w2	
239	Greenish Warbler	*Phylloscopus trochiloides*	w2	
240	Large-billed Leaf Warbler	*Phylloscopus magnirostris*	w4	
241	Green-crowned Warbler	*Seicercus burkii*	r2	
242	Whistler's Warbler	*Seicercus whistlari*	w3	
243	Grey-hooded Warbler	*Seicercus xanthoschistos*	r1	
244	Chestnut-crowned Warbler	*Seicercus castaniceps*	r2	
245	Black-faced Warbler	*Abroscopus schisticeps*	r2	
246	White-throated Laughingthrush	*Garrulax albogularis*	r1	
247	White-crested Laughingthrush	*Garrulax leucolophus*	r1	
248	Striated Laughingthrush	*Garrulax striatus*	r1	
249	Rufous-chinned Laughingthrush	*Garrulax rufogularis*	V r2	
250	Grey-sided Laughing thrush	*Garrulax caerulatus*	VU r4	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
251	Streaked Laughingthrush	*Garrulax lineatus*	r2	
252	Blue-winged Laughingthrush	*Garrulax squamatus*	VU r5	
253	Chestnut-crowned Laughingthrush	*Garrulax erythrocephalus*	r1	
254	Puff-throated Babbler	*Pellorneum ruficeps*	s3	
255	Rusty-cheeked Scimitar Babbler	*Pomatorhinus erythrogenys*	r1	
256	White-browed Scimitar Babbler	*Pomatorhinus schisticeps*	r4	
257	Streak-breasted Scimitar Babbler	*Pomatorhinus ruficollis*	r2	
258	Slender-billed Scimitar Babbler	*Xiphirhynchus superciliaris*	VU r5	
259	Scaly-breasted Wren Babbler	*Pnoepyga albiventer*	r2	
260	Nepal Wren Babbler	*Pnoepyga immaculata*	w5	
261	Pygmy Wren Babbler	*Pnoepyga pusilla*	r3	
262	Black-chinned Babbler	*Stachyris pyrrhops*	r2	
263	Grey-throated Babbler	*Stachyris nigriceps*	r2	
264	Spiny Babbler	*Turdoides nipalensis*	r3	
265	Red-billed Leiothrix	*Leiothrix lutea*	r2	
266	Himalayan Cutia	*Cutia nipalensis*	VU r4	
267	Black-headed Shrike Babbler	*Pteruthius rufiventer*	VU r4	
268	White-browed Shrike Babbler	*Pteruthius flaviscapis*	r3	
269	Green Shrike Babbler	*Pteruthius xanthochlorus*	r3	
270	Black-eared Shrike Babbler	*Pteruthius melanotis*	r3	
271	Hoary-throated Barwing	*Actinodura nipalensis*	r3	
272	Blue-winged Siva	*Minla cyanouroptera*	r3	
273	Bar-throated Siva	*Minla strigula*	r2	
274	Red-tailed Minla	*Minla ignotincta*	r4	
275	Rufous-winged Fulvetta	*Alcippe castaneceps*	r2	
276	White-browed Fulvetta	*Alcippe vinipectus*	r2	
277	Nepal Fulvetta	*Alcippe nipalensis*	r2	
278	Whiskered Yuhina	*Yuhina flavicollis*	r2	
279	Stripe-throated Yuhina	*Yuhina gularis*	r2	
280	Rufous-vented Yuhina	*Yuhina occipitalis*	r3	
281	White-bellied Yuhina	*Yuhina zantholeuca*	r3	
282	Rufous Sibia	*Heterophasia capistrata*	r1	
283	Black-throated Parrotbill	*Paradoxornis nipalensis*	r4	
	Nectariniidae			
284	Thick-billed Flowerpecker	*Dicaeum agile*	s4	
285	Yellow-bellied Flowerpecker	*Dicaeum melanoxanthum*	r4	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
286	Fire-breasted Flowerpecker	*Dicaeum ignipectus*	r1	
287	Purple Sunbird	*Nectarinia asiatica*	r2	
288	Mrs Gould's Sunbird	*Aethopyga gouldiae*	r4	
289	Green-tailed Sunbird	*Aethopyga nipalensis*	r1	
290	Black-throated Sunbird	*Aethopyga saturata*	r2	
291	Crimson Sunbird	*Aethopyga siparaja*	r3	
292	Fire-tailed Sunbird	*Aethopyga ignicauda*	r3	
	Passeridae			
293	House Sparrow	*Passer domesticus*	r1	
294	Russet Sparrow	*Passer rutilans*	r4	
295	Eurasian Tree Sparrow	*Passer montanus*	r1	
296	White Wagtail	*Motacilla alba*	w2	
297	Grey Wagtail	*Motacilla cinerea*	w2	
298	Upland Pipit	*Anthus sylvanus*	r5	
299	Olive-backed Pipit	*Anthus hodgsoni*	r1	
300	Rosy Pipit	*Anthus roseatus*	w3	
301	Rufous-breasted Accentor	*Prunella strophiata*	w3	
302	Maroon-backed Accentor	*Prunella immaculata*	w4	
303	White-rumped Munia	*Lonchura striata*	r3	
304	Scaly-breasted Munia	*Lonchura punctulata*	r2	
	Fringillidae			
305	Plain Mountain Finch	*Leucosticte nemoricola*	w4	
306	Yellow-breasted Greenfinch	*Carduelis spinoides*	r2	
307	Tibetan Siskin	*Carduelis thibetana*	w5	
308	Dark-breasted Rosefinch	*Carpodacus nipalensis*	w3	
309	Common Rosefinch	*Carpodacus erythrinus*	w3	
310	Pink-browed Rosefinch	*Carpodacus rodochrous*	w4	
311	White-browed Rosefinch	*Carpodacus thura*	w4	
312	Crimson-browed Finch	*Pinicola subhimachalus*	w4	
313	Scarlet Finch	*Haematospiza sipahi*	w5	
314	Brown Bullfinch	*Pyrrhula nipalensis*	r3	
315	Red-headed Bullfinch	*Pyrrhula erythrocephala*	r4	
316	Spot-winged Grosbeak	*Mycerobas melanozanthos*	r3	
317	White-winged Grosbeak	*Mycerobas carnipes*	r4	
318	Gold-naped Finch	*Pyrrhoplectes epauletta*	w4	
319	Crested Bunting	*Melophus lathami*	r3	
320	Little Bunting	*Emberiza pusilla*	r4	

SN	ENGLISH NAME	SCIENTIFIC NAME	STATUS	REFERENCE
	Key to checklist			
1	Common			
2	Fairly common			
3	Occasional			
4	Uncommon			
5	Rare			
m	Passage migrant			
r	Resident			
s	Summer migrant			
w	Winter migrant			
v	Vagrant			
?	Status of abundance uncertain			
CR	Critical			
EN	Endangered			
VU	Vulnerable			

ANNEX 3

Herpetofauna of Shivapuri Nagarjun National Park

No.	Scientific Names	Common Names	Means of Verification
1.	*Bufo melanosticus*	Black-spined Toad	Observation
2.	*Bufo stomaticus*	Marbled Toad	Observation
3.	*Megophrys parva*	Myanmar Pelobatid Toad	Observation
4.	*Microhyla ornata*	Ornate Narrow-mouthed Frog	Observation
5.	*Chaparana sikimmensis*	Sikkimese frog	Observation
6.	*Euphlyctis cyanophlyctis*	Skittering Frog	Observation
7.	*Hoplobatrachus tigerinus*	Indian Bull Frog, Tiger Frog	Observation
8.	*Limnonectes syhadrensis*	Syhadra Frog	Observation
9.	*Nanorana liebigii*	Liebig's frog	Observation
Reptiles			
1.	*Calotes versicolor versocolor*	Common Garden Lizard	Observation
2.	*Japalura variegata*	Variegated Japalura	Literature
3.	*Oriotiaris tricarinata*	Three-keeled Mountain Lizard	Observation
4.	*Asymblepharus sikimmensis*	Sikkim Skink	Observation
5.	*Mabuya carinata*	Brahminy Skink	Observation
6.	*Varanus bengalensis*	Bengal Monitor	Lit. & Inter.
7.	*Amphiesma platyceps*	Mountain Keelback	Observation
8.	*Amphiesma stolatum*	Buff-striped Keelback	Observation
9.	*Elaphe hodgsoni*	Himalayan Trinket Snake	Observation
10.	*Lycodon aulicus*	Common Wolf Snake	Observation
11.	*Pseudoxenodon macrops*	Indian False Cobra	Photo Observation
12.	*Ptyas mucosa mucosa*	Asiatic Rat Snake	Lit. & Inter.
13.	*Trachischium leave*	Olive Oriental slender snake	Literature
14.	*Trachischium tenuiceps*	Orange-bellied worm snake	Literature
15.	*Xenochrophis piscator*	Chequered Keelback Water Snake	Observation
16.	*Naja kaouthia*	Monocled Cobra	Lit. & Inter.
17.	*Naja naja*	Spectacled Cobra	Lit. & Inter.
18.	*Ophiophagus hannah*	King cobra	Observation/ Photograph
19.	*Ovophis monticola*	Mountain Pit Viper	Observation
20.	*Trimeresurus albolabris*	White-liped Pit Viper	Literature

ANNEX 4

Butterflies of Shivapuri Nagarjun National Park

S.N.	Scientific Name	Authority	Sites	Remarks
Family: Lycaenidae				
1	*Arophala pseudocentaurus*	Doubleday	Shivapuri, Nagarjun, Sundarijal	Common
2	*Arophala rama*	Kollar	Shivapuri	Common
3	*Arophala paramuta*	DeNiceville	Nagarjun, Sundarijal	Rare
4	*Amblopala avidiena*	Hewitson	Nagarjun	
5	*Everes argiades*	Pallas	Shivapuri, Sundarijal	
6	*Chliaria kina*	Hewitson Common	Shivapuri	Uncommon
7	*Jamides celeno*	Cramer	Shivapuri, Sundarijal, Nagarjun, Kakani	Common
8	*Zizeeria maha*	Kollar	Shivapuri, Sundarijal, Nagarjun, Kakani	Common
9	*Panchala birmana*	Moore	Nagarjun	Rare
10	*Deudoryx epijarbus*	Moore	Shivapuri	Uncommon
11	*Chaetoprocta odata*	Hewitson	Shivapuri, Sundarijal	Uncommon
12	*Everes lacturnus*	Godart	Nagarjun	Rare
13	*Syntarucus plinius*	Fabricius	Shivapuri, Nagarjun	Rare
14	*Tajuria luculentus*		Shivapuri, Nagarjun	Rare
15	*Flos areste*	Hewitson	Shivapuri	Rare
16	*Euaspa miliona*	Hewitson	Shivapuri, Sundarijal	Uncommon
17	*Everes huegelii*	Gistel	Shivapuri, Nagarjun	Unommon
18	*Udara dilecta*	Moore	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
19	*Udara albocerulea*	Moore	Shivapuri, Nagarjun	Common
20	*Celatoxia marginata*	DeNiceville	Shivapuri, nagarjun	Uncommon
21	*Actyolepsis puspa*	Horsfieldii	Shivapuri, Sundarijal, Nagarjun	
22	*Celastrina hersilia*		Shivapuri, Nagarjun	Rare
23	*Freyeria trochilus*	Freyer	Shivapuri, Sundarijal, Sundarijal	
Family: Papilionidae				
24	*Teinopalpus imperialis*	Hope	Nagarjun	Rare
25	*Troides aeacus*	Felder	Shivapuri, Nagarjun, Sundarijal	Uncommon

S.N.	Scientific Name	Authority	Sites	Remarks
26	*Papilio helenus*	Linnaeus	Shivapuri, Sundarijal	Uncommon
27	*Graphum agamemnon*	Linnaeus	Sundarjal, Shivapuri and Nagarjun	Common
28	*Papilio protenor*	Cramer	Sunarijal, Shivapuri and Nagarjun	Common
29	*Achillides paris*	Linnaeus	Shivapuri	Uncommon
30	*Achillides polyctor*	Boisduval	Sundarijal, Shivapuri and Nagarjun	Common
31	*Achillides krishna*		Shivapuri	Endangered and rare
32	*Graphium sarpedon*	Linnaeus	Sundarijal, Shivapuri and Nagarjun	Common
33	*Papilio rhetenor*	Westwood	Shivapuri, Nagarjun	Uncommon
34	*Papilio machaon*	Linnaeus	Shivapuri, Sundarijal and Nagarjun	Uncommon
35	*Pathysa glycerion*	Gray	Nagarjun	Rare
36	*Cadugoides epycides*	Hewitson	Shivapuri, Nagarjun	Rare
37	*Achillides arcturus*	Westwood	Shivapuri, Nagarjun	Rare
38	*Papilio polytes*	Linnaeus	Sundarijal, Shivapuri and Nagarjun	Common
39	*Papilio memnon*	Linnaeus	Sundarijal, Shivapuri and Nagarjun	Common
Family: Nymphalidae				
40	*Neptis radha*	Moore	Shivapuri	Uncommon
41	*Neptis ananta*	Moore	ShivapuriShivapuri, Nagarjun	Common
42	*Sephisa chandra*	Moore	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
43	*Euthalia patala*	Kollar	Shivapuri, Nagarjun	Common
44	*Euthalia sahadeva*	Moore	Shivapuri, Nagarjun	Rare
45	Euthalia franciae	*Gray*	*Nagarjun*	*Rare*
46	*Sumalia danava*	Moore	Shivapuri, Nagarjun	Rare
47	*Sumalia dudu*	Westwood & Doubleday	Shivapuri, Sundarijal	Rare
48	*Abrota ganga*	Moore	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
49	*Polyura dolon*	Westwood	Shivapuri, Nagarjun, Sundarijal, kakani	Uncommon
50	*Neptis clinia*	Moore	Shivapuri, Nagarjun	Rare
51	*Athyma jina*	Moore	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
52	*Athyma opalina*	Kollar	Shivapuri, Nagarjun, Sundarijal, Kakani	Common

S.N.	Scientific Name	Authority	Sites	Remarks
53	*Athyma cama*	Moore	Nagarjun.Sundarijal	Uncommon
54	*Cethosia biblis*	Drury	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
55	*Hypolymnas missipus*	Linnaeus	Shivapuri, Nagarjun, Sundarijal	Common
56	*Neptis sankara*	Kollar	Nagarjun	Rare
57	*Symbrenthia niphanda*	Moore	Shivapuri, Nagarjun, Sundarijal	Common
58	*Argyreus hyperbius*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
59	*Cyrestis thyodamus*	Boisduval	Shivapuri, Nagarjun, Shivapuri	Common
60	*Neptis hylas*	Linnaeus	Shivapuri, nagarjun, Sundarijal, kakani	Common
61	*Neptis armandia*	Oberthur	Shivapuri, Nagarjun	Uncommon
62	*Precis almana*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
63	*Precis hierta*	Fabricius	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
64	*Précis iphita*		Shivapuri, Nagarjun. Sundarijal, Kakani	Common
65	*Kaniska canace*	Linnaeus	Shivapuri, Sundarijal	Uncommon
66	*Issoria issaea*	Doubleday	Shivapuri, Nagarjun, Sundarijal, Kakani	Uncommon
67	*Nymphalis xanthomelas*	Denise & Schieff	Nagarjun, Sundarijal	Rare
68	*Vanessa cardui*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
69	*Vanessa indica*	Herbst	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
70	*Aglais cashmirensis*	Kollar	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
71	*Kalima inachus*		Shivapuri, Sundarijal	Uncommon
72	*Stibochioena nicea*		Shivapuri, Sundarijal	Uncommon
73	*Polyura athamus*		Shivapuri, Nagarjun	Rare
74	*Pseudergolis wedah*		Shivapuri, Sundarijal, Nagarjun	Uncommon
Family: Pieridae				
75	*Catopsilia pomana*	Fabricius	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
76	*Appias lalage*	Doubleday	Shivapuri, Nagarjun	Rare
77	*Appias lyncida*	Cramer	Shivapuri, Sundarijal	Rare
78	*Colias erate*	Esper	Shivapuri, Sundarijal, Nagarjun	Common

S.N.	Scientific Name	Authority	Sites	Remarks
79	*Belenois aurota*	Fabricius	Nagarjun	Uncommon
80	*Delias sanaca*	Moore	Shivapuri, Nagarjun	Uncommon
81	*Delias belladonna*	Fabricius	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
82	*Pieris canidia*	Sparman	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
83	*Pieris brassicae*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
84	*Eurema hecabe*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
85	*Gonepteryx rhamni*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
Family: Nemeobiidae				
86	*Abisara neophron*	Hewitson	Shivapuri, Nagarjun	Uncommon
87	Abisara fylla		Shivapuri, Nagarjun, Sundarijal, kakani	Common
88	*Dodona egeon*	Westwood	Shivapuri., Nagarjun	Common
89	*Dodona adinora*		Shivapuri, Nagarjun, Sundarijal	Common
90	*Dodona dipoea*		Nagarjun,Shivapuri, Sundarijal	Common
91	*Dodona eugenes*		Shivapuri, Nagarjun, Sundarijal	Common
92	*Zemeros fleygas*		Shivapuri, Nagarjun, Sundarijal, Kakai	Common
Family: Satyridae				
93	*Patala yama*	Moore	Shivapuri, Nagarjun	Rare
94	*Elymnias malelas*	Hewitson	Nagarjun	Rare
95	*Melanitis leda*	Linnaeus	Shivapuri, Nagarjun	Common
96	*Orinoma damaris*	Gray	Shivapuri, Nagarjun	Uncommon
97	*Callerebia annada*	Moore	Shivapuri, Nagarjun	Common
98	*Callerebia hybrida*	Butler	Shivapuri, Nagarjun, Kakani	Uncommon
99	*Callerebia scanda*	Kollar	Shivapuri, Nagarjun	Uncommon
100	*Mycalesis francisca*	Stoll	Shivapuri	Uncommon
101	*Ypthima sakra*	Moore	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
102	*Aulocera loha*	Doherty	Nagarjun, Kakani	Rare
103	*Lethe baladeva*	Moore	Shivapuri	Uncommon
104	*Orsotrioena medus*	Fabricius	Shivapuri, Sundarijal, Nagarjun	Common
105	*Nemetis chandica*		Shivapuri, Nagarjun	Rare
Family: Danaidae				
106	*Danaus limniace*	Cramer	Shivapuri, Nagarjun, Sundarijal, Kakani	Common

S.N.	Scientific Name	Authority	Sites	Remarks
107	*Danaus tytia*	Gray	Shivapuri, Nagarjun, Sundarijal	Rare
108	*Danaus aglea*	Stoll	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
109	*Danaus chryssipus*	Linnaeus	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
110	*Danaus genutia*		Shivapuri, Nagarjun, Sundarijal, Kakani	Common
111	*Euploea core*	Cramer	Shivapuri, Nagarjun, Sundarijal, kakani	Common
112	*Euploea mulciber*	Cramer	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
Family: Libytheidae				
113	*Libythea lepita*	Moore	Shivapuri, Sunadijal	Uncommon
Family: Acreidae				
114	*Acrea issaea*		Shivapuri, Nagarjun, Sundarijal, Kakani	Common
Family: Hesperiidae				
115	*Choaspes heximanthes*	Rothschild and Jordan	Shivapuri, Nagarjun	Rare
116	*Hasora chromus*	Cramer	Sundarijal	Rare
117	*Seseeria dohertyi*	Watson	Shivapuri, Nagarjun	Uncommon
118	*Thoressa aina*	DeNiceville	Shivapuri, Nagarjun	Rare
119	*Lobocla liliana*	Atkinson	Shivapuri, Sundarijal	Rare
120	*Parnara naso bada*	Fabricius	Shivapuri, Nagarjun, Sundarijal, Kakani	Common
121	*Parnara guttata*	Bremer & Grey	Shivapuri, Sundarijal, Kakani	Uncommon
122	*Celaenorrhinus ratna*	Fruhstorfer	Nagarjun	Rare
123	*Caltoris tulsi*	DeNiceville	Shivapuri, Sundarijal	Uncommon
124	*Ochlodes brahma*	Moore	Nagarjun	Rare

ANNEX 5

Insects of Shivapuri Nagarjun National Park

S.N.	Scientific Name	Authority	Sites	Remarks
Order: Hemiptera (Bugs)				
1	*Durgades nigropictus*	*Distant, 1912*		
2	*Nehela* sp		Sundarijal	
3	*Exitianus* sp		Shivapuri	
4	*Chiasmus uzeii*		Sundarijal and Shivapuri base	
5	*Haranga orientalis*	*Walker, 1851*	Sundarijal, Buddhanilkantha	
6	*Namasangia garialis*	*Distant, 1908*		
7	*Farynala silacea*	*Thapa, 1989*	Nagarjun	
8	*Limassolla kumatai*	*Thapa*	Nagarjun forest	
9	*Beesonia napiformis*		Nagarjun (1,500m) and Sundarijal.	
10	*Chionapsis* cornigera	*Takagi, 1985*	Nepal: Kathmandu – Shivapuri	
11	*Neoquernaspis howelli*	*Liu et Tippins, 1988*	Sundarijal (1,560m)	
12	*Megacoelum pervalidum*	*Distant, 1909*	Sundarijal (Soondarijal)	
13	*Gerris nepalensis*	*Distant, 1910*	Sundarijal	
14	*Metrocoris nepalensis*	*Distant, 1910*	Nepal Sundarijal	
15	*Mollitrichosiphum alni*	*Ghosh et al., 1970*	Nagarjun, Narayansthan	
16	*Abidama producta*	Walker, 1851	Sundarijal	
17	*Haranga orientalis*	Walker, 1851	Sundarijal	
18	*Farynala extremita*	Dworakowska, 1982	Nagarjun forest	
19	*Takagioma unita*	Thapa, 1989	Nagarjun forest	
20	*T. manica*	Thapa, 1989	Nagarjun on Grewia sp.	
21	*Megacoelum pervalidum*		Sundarijal	
22	*Cameronaspis adinandrae*	Takagi et al., 1988	Nagarjung (1,470m)	
23	*C. cornigera*	Takagi, 1985	Shivapuri (Siwapuri)	
24	*Anthocoris* sp.		Shivapuri.	
25	*Dalpada melania*	Distant, 1908	Nagarjun	

S.N.	Scientific Name	Authority	Sites	Remarks
26	*Cicada imperatoria*	Westwood	Nagarjun	
27	*Chionapsis cornigera*	Takagi, 1985	Shivapuri	
Order: Hymenoptera (Wasps, bees and ants)				
28	*Coccygomimus cameronii*	Dalla Torre, 1901	Kakani	
29	*Amblyjoppa annulitarsis annulitarsis*		Kakani	
30	*Isandria spiniventris*	Heinrich	Kakani	
31	*Eccoptosage miniata*	Uchida	Kakani	
32	*Scolia* sp		Sundarijal	
33	*Polistes olivaceus*	de Geer, 1973	Sundarijal	
34	*Polistes tenebricosus sulcatus*	Yamane et Yaman	Nagarjun	
35	*C. cameronii*	Dalla Torre, 1901	Kakani	
36	*Stenaoplus ornatitarsis*	Cameron	Sundarijal	
Oredr: Coleoptera (Beetles)				
37	*Pristonychus pseudodolens*	Morvan, 1978	Nepal: Chisapani	
38	*Cicindela decempunctata*	Mandl, 1970	Nagarjun (1,400-1,600m)	
39	*C. dromicoides*	Chaudoir, 1852	Nagarjun (1,400-1,600m)	
40	*Metagyrinus arrowi*	Régimbart, 1907	Sundarijal	
41	*spinosus nepalensis*	Ochs, 1929	Sundarijal, Sanku	
42	*Ipelates sikkimensis*	Portevin, 1905	Nagarjung Pass	
43	*Agathidium brahmano*	Angelini et de Marzo, 1986	Nagarjun (1,400-2,100m)	Rare
44	*Agathidium kathmanduense*	Angelini et de Marzo, 1981	Nagarjun (1,400-2,100m)	Rare
45	*Prostomis beatae*	Schawaller, 1991	Shivapuri (1,800-2,500m).	
46	*Epipedocera undulata*	Hope, 1837	Nagarjun (1,500-1,700m)	
47	*Macrotoma crenata*	Fabricius, 1801	Nagarjung (1,500-1,700m)	Rare (1 e.g.). June
48	*Chlamys indicus*	Jacoby, 1901	Kakani Danda (2,286m).	Rare (1 e.g.). June
49	*Merista quadrifasciata*	Hope, 1831	Sundarijal	Uncommon
50	*Hoplocerambyx spinicornis*	Newman, 1842	Nagarjun (1,500-1,700m).	
51	*Hoplasoma sexmaculata*	Hope, 1831	Shivapuri, Sundarijal	Uncommon
52	*M. phalerata*	Pallas, 1781	Shivapuri, nagarjun, Sundarijal, Kakani	Uncommon
53	*Atheta suspiciosa kathmanduorum*	Pace, 1955	Nagarjun (1,900-2,100m)	
54	*Schistoglossa biapicalis*	Pace, 1955	Nagarjun (1,900 -2,100m).	

S.N.	Scientific Name	Authority	Sites	Remarks
55	*Edaphus lineatus*	Puthz, 1979	Nepal: Kathmandu - Nagarjung (1,400-1,600m)	
56	*E. lineatus*	Puthz, 1979	Nepal: Kathmandu - Nagarjung (1,400-1,600m).	
57	*Stenaesthetus canaliculatus taurulus*	Puthz, 1987	Nagarjun (1,900 -2,000m)	Subspecies described from Nepal
58	*Colasposoma semicostatum*	Jacoby, 1908	Sundarijal (1450 m)	Rare
59	*Hespera krishna*	Maulik, 1926	Sundarijal (1450 m)	Rare
60	*Oxytelopsis franzi*	Coiffait, 1982	Holotype Mulkharka (Mulkarka).	
61	*Lobochilus fortepunctatus*	Cameron	Budhanilkantha (1,150m)	
62	*Quedius decipiens*	Cameron, 1944	India (W. Bengal Mulkharka	
63	*Amara (B.) sikkimensis*	Andrews, 1930	Mulkharka	Less common
64	*Cicindela decempunctata subtilesignata*	Mandl, 1970	Nagarjun (1,400 -1,600m)	Rare
65	*C. dromicoides*	Chaudoir, 1852	Nagarjun (1,400 -1,600m)	Less common
66	*Metagyrinus arrowi*	Régimbart, 1907	Sundarijal	Uncommon
67	*Dineutus (Spinosodineutes) spinosus nepalensis*	Ochs, 1929	Sundarijal, Sanku	Common.
68	*Ipelates sikkimensis*	Portevin, 1905	Nagarjung	Uncommon
69	*Agathidium brahmano*	Angelini et de Marzo, 1986	Nagarjun (1,400 -2,100m)	
70	*A. kathmanduense*	Angelini et de Marzo, 1981	Nagarjun (1,400 -2,100m)	Holotype from Nepal. Rare
71	*Luciola cruciata*		Junkiri, Common	
72	*Hoplocerambyx spinicornis*	Newman, 1842	Nagarjun (1,500-1,700m).	Uncommon
73	*Macrotoma crenata*	Fabricius, 1801	Nagarjung (1,500-1,700m).	Rare
74	*Chlamys indicus*	Jacoby, 1901	Kakani Danda (2,286m).	Rare
75	*Merista quadrifasciata*	Hope, 1831	Kakani	Uncommon
76	*Dicladispa armigera*	Oliver, 1808		Common / Common Name: Rice Hispa (Kande Khabate)
77	*Gonocephalum civicum*	Kaszab, 1952	Mulkharka and Chisapani (2,000m)	

S.N.	Scientific Name	Authority	Sites	Remarks
78	*Hexahopalus entomogonoides*	Allard, 1896	Mulkharka, Chisapani (2,000m)	Uncommon
79	*Laena franziana*	Kaszab, 1973	Sundarijal near Mulkharka (2,000-2,200m)	Uncommon
80	*L. luprops*	Kaszab, 1973	Mulkharka	Uncommon.
81	*Melanotus nepalensis*	Ohira et Becker, 1974	Sundarijal	Uncommon
79	*Prostomis beatae*	Schawaller, 1991	Shivapuri (Sheopuri: 1,800-2,500m)	Uncommon
80	*Gonocephalum bilineatum*	Walker, 1858	Sundarijal near Mulkharka	Common.
81	*G. civicum*	Kaszab, 1952	Mulkharka and Chisapani (2,000m)	Uncommon
82	*G. nepalicum*	Kaszab, 1973	Holotype from Nepal : Mulkharka and Chisapani	Uncommon
83	*Eupatorus hardwicki*	Hope, 1831	Nagarjun (1,500m)	Uncommon
84	*Xylotrupes gideon*	Linn., 1767	Nagarjun; Makawanpur	Less common
85	*Gonocephalum bilineatum*	Walker, 1858	Sundarijal near Mulkharka	Common
86	*G. nepalicum*	Kaszab, 1973	Mulkharka and Chisapani	Common
Order : Diptera (Flies)				
87	*Helophilus aeneus*	Brunetti, 1907	Sundarijal	
88	*Milesia balteata*	Kertesz, 1901	Sundarijal	
89	*Betasyrphus albipilus*	Coe, 1965	Sundarijal	Less common
90	*Drosophila immiigrans*	Sturtevant, 1921	Kakani	
91	*Calliphora vicina*	Robineau-Desvoidy, 1830	Nagarjun (2,096m)	Less common.
92	*Hemipyrellia ligurriens*	Wiedemann, 1830	Shivapuri (1,500-2,000m)	Uncommon
93	*Lucilia cupria*	Wiedemann, 1830	Nagarjun (1,460-2,150m)	Uncommon
94	*L. shenyangensis*	Fan, 1965	Nagarjun	Common
95	*Chrysomya megacephala*	Fabricius, 1794	Shivapuri (1,800-2,300m)	Common
96	*Chrysomya pinguis*	Walker, 1858	Shivapuri (1,600-1,700m)	More common
97	*C. thanomthini*	Kurahashi, 1977	Shivapuri (1,800 -2,300m)	Uncommon
98	*Stomoxys calcitrans*	Linnaeus, 1758	Shivapuri (1,900m)	Less common
99	*Sarcophaga albiceps*	Meigen, 1826	Sundarijal, Shivapuri	Common
100	S. cruentata	Meigen, 1826	Sundarijal, Nagarjun, Shivapuri	Common
101	S. doleschalii	Johnston et Tiges, 1921	Sundarijal, Nagarjun, Shivapuri	Common

S.N.	Scientific Name	Authority	Sites	Remarks
Order: Thysanoptera (Thrips)				
102	*Dendrothrips shimae*	Kudo, 1989	Shivapuri 1700 m	
Order : Odonata (Dragonflies)				
103	*Anax guttatus*	Burmeister, 1839	Nagarjun (1500- 1700 m)	
104	*Gynacantha incisura*	1935	Nagarjun 1500-1700 m	Uncommon
105	*Anotogaster nipalensis*	Selys, 1850	Nagarjun-1500-1700 m	Uncommon
106	*Anisogomphus bivittatus*	Selys, 1854	Sundarijal, Nagarjun (1500-1700 m)	
107	*Lamelligomphus biforceps*	Selys, 1878	Nagarjun1500-1700 m	Uncommon
108	*Ictinus rapax*	Rambur, 1842	Nagarjun 1500-1700 m	
Family: Libellulidae				
109	*Brachydiplax sobina*	Rambur, 1842	Nagarjun 1500 m	less common
110	*Palpopleura sexmaculata*	Fabricus, 1857	Nagarjun	Uncommon
111	*Orthretum glaucum*		Nagarjun	Uncommon
112	*Orthretum japonicum*	MacLachlan 1894	Nagarjun	less common
113	*Orthretum luzonicum*	Brauer, 1868	Kakani	
114	*O. pruinosum*	Rambur, 1848	Nagarjun	Less common
115	*O. sabina*	Drury, 1770	Nagarjun	Less common
116	*Potamarcha obscura*	Rambur, 1848	Nagarjun 1350 m	less common
117	*Pantala flavascens*	Fabricius, 1798	Nagarjun	Uncommon
118	*Tramea basilaris*	Kirby, 1889	Nagarjun (1500-1700 m)	Uncommon
Sub Order: Anisozygoptera				
119	*Epiophlebia laidlawii*	Tillvard, 1921	Shivapuri	
Sub Order: Zygoptera				
120	*Caliphaea confuse*	Selys, 1859	Shivapuri	Less Common
121	*Rhinocypha trifasciata*	Selys, 1853	Nagarjun	Less common
Family : Coenogridae				
122	*Ceriagrion azureum*	Selys, 1891	Nagarjun 1500-1700 m	Less common

ANNEX 6

Dicot flora of Shivapuri Nagarjun National Park

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
Acanthaceae								
1	*Adhatoda vasica* Nees	Asuro, Kalo bhasak	Shrub	1300-1500				
2	*Asystasia macrocarpa* Nees		Shrub	2300				
3	*Barleria cristata* L.	Bhende kuro	Shrub	1300				
4	*Dicliptera bupleuroides* Nees		Herb	1700				
5	*Eranthemum pulchellum* Andrews.	Nil gathe	Straggling shrub	1700				
6	*Hypoestes triflora* (Forsk.) Roemer & Schultes	Sim kuro	Herb	1300				
7	*Justicia procumbens* L. *var. simplex* (D. Don) Yamazaki		Herb	1300-1800				
8	*Lepidagathis incurva* D. Don		Herb	1400				
9	*Peristrophe speciosa* Nees		Straggling herb	1700				
10	*Rungia parviflora* Nees		Herb	1500				
11	*Strobilanthes atropurpureus* Nees		Straggling herb	1500-2400				
12	*Thunbergia coccinea* Wall.	Singarne lahara	Climber	1800-2000				
13	*Thunbergia fragrans* Roxb.		Climber	1300				
Aceraceae								
14	*Acer oblongum* Wall. ex DC.	Firfire	Tree	1300-1500				
Aizoaceae								
15	*Mollugo pentaphylla L.*		Herb	1400				
Alangiaceae								
16	*Alangium chinense* (Lour.) Harms		Tree	1500				
Amaranthaceae								
17	*Achyranthes bidentata* Blume		Herb	1300				
18	*Alternanthera sessilis* (L.) DC.	Bhiringi jhar	Herb	1300				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
19	*Amaranthus spinosus* L.	Ban lude	Herb	1300				
20	*Amaranthus viridis* L.		Herb	1300				
21	*Cyathula tomentosa* (Roth.) Moquin		Straggling herb or shurb	1300				
Anacardiaceae								
22	*Choerospondias axillaris* (Roxb.) B. L. Burtt & A. W. Hill	Lapsi	Tree	1400-1800				
23	*Dobinea vulgaris* Buch.-Ham. ex D. Don		Shrub	1700				
24	*Rhus javanica* L.	Dudhe bhalayo, Bhaki amilo	Shrub or tree	1800				
25	*Rhus parviflora* Roxb.	Sati bayar	Shrub	1500				
26	*Rhus succedanea* L.	Rani bhalayo	Tree	2400				
27	*Rhus wallichii* Hook. f.	Thulo bhalayo	Tree	1500				
Apocynaceae								
28	*Nerium oleander* L.	Barhamase	Shrub	1400				
29	*Thevetia peruviana* (Pers.) K. Schum.		Tree	1400				
30	*Trachelospermum lucidum* (D. Don) K. Shum		Climbing shrub	1800				
31	*Vallaris solanacea* (Roth.) O. Kuntze		Twinning shrub	1300				
Aquifoliaceae								
32	*Ilex dipyrena* Wall.	Seto khasru	Tree	2300				
33	*Ilex doniana* DC.	Punwale	Tree	1300				
34	*Ilex umbellulata* (Wall.) Loesener		Tree	1500				
Araliaceae								
35	*Acanthopanax cissifolium* (Griff.) Harm.		Climber	2500				
36	*Brassaiopsis hainla* (Ham.) Seems		Tree	2000				
37	*Hedera nepalensis* K. Koch.		Climber	1400-2400				
38	*Macropanax dispermus* (Bl.) O. Kuntze		Tree	2000				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
39	*Panax pseudo-ginseng* Wall.		Herb	2700				
40	*Schefflera impressa* (C.B. Clarke) Harms		Tree	2000				
Aristolochiaceae								
41	*Aristolochia griffithii* Hook. f. & Thoms. ex Ducharten	Hans phul	Climber	2600				
Asclepiadaceae								
42	*Asclepias curassavica* L.		Herb	1300				
43	*Ceropegia longifolia* Wall.		Climber	1600				
44	*Ceropegia pubescens* Wall.	Mirke laharo	Climber	2000				
45	*Cryptolepis buchannani* Roem. ex Sch.		Climbing shrub	1300				
46	*Cynanchum glaucum* Wall.		Herb	1300				
47	*Cynanchum vincetoxicum* Pers.		Herb	1900				
48	*Hoya lanceolata* Wall. ex D. Don		Epiphytic herb	1500				
49	*Hoya longifolia* Wall. ex Wight		Epiphytic shrub	1500				
50	*Tylophora hirsuta* (Wall.) Wight		Climber	1300-1500				
51	*Tylophora tenerrima* Wight		Climber	2350				
Begoniaceae								
52	*Begonia dioica* Buch.-Ham. D. Don		Herb	2200				
53	*Begonia hatacoa* Buch.-Ham. ex. D. Don		Herb	2000				
54	*Begonia picta* Sm.	Magar kanche	Herb	1400				
55	*Begonia rubella* Buch.-Ham. ex. D. Don	Magar kanche	Herb	2000				
56	*Begonia scutata* Wall. ex. DC.		Herb	1600				
57	*Begonia sikkimensis* A. DC.		Herb	2000				
Berberiaceae								
58	*Mahonia napaulensis* DC.	Jamane mandro	Shrub or small tree	1600				
59	*Berberis aristata* DC.	Chutro	Shrub	2400				
60	*Berberis asiatica* Roxb. ex DC.	Chutro	Shrub	1800				
61	*Berberis chitria* Buch.-Ham. ex Lindl.	Chutro	Shrub	2500				
62	*Berberis wallichiana* DC.	Chutro	Shrub	2500				Endemic to Nepal
63	*Mahonia acanthifolia* G. Don	Jamane mandro	Shrub or small tree	1600				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
Betulaceae								
64	*Alnus nepalensis* D. Don	Utis	Tree	1500				
65	*Betula alnoides* Buch.-Ham. ex D. Don	Saur	Tree	1800				
Boraginaceae								
66	*Bothriospermum tenellum* Fish. & May.		Herb	1400				
67	*Cynoglossum lanceolatum* Forsk.	Kuro	Herb	1500				
68	*Cynoglossum zeylanicum* Thunb. ex Lehm.		Herb	1500				
69	*Ehretia acuminata* R. Br.	Seto lodho	Tree	1400				
70	*Ehretia macrophyla* Wall. ex Roxb.	Thulo lodho	Tree	1600				
71	*Trigonotis macrocarpa* (Wall.) Benth. ex C. B. Clarke		Herb	1600				
Buxaceae								
72	*Sarcococca coriacea* (Hook.) Sweet	Fitti fiya	Shrub	1300-2500				
73	*Sarcococca hookeriana* Baillon	Khursani pat	Shrub	2100				
Callitrichaceae								
74	*Callitriche stagnalis* Scop.		Aquatic herb	2500				
Campanulaceae								
75	*Campanula argyrotricha* Wall. ex DC.		Herb	1400				
76	*Campanula colorata* Wall.	Nepali bikh	Herb	1500-2100				
77	*Campanula sylvatica* Wall.		Herb	1700				
78	*Codonopsis inflata* Hook. f. & Thoms.		Herb	2200				
79	*Codonopsis purpurea* Wall.		Herb	2200				
80	*Lobelia chinensis* Lour.		Herb	1800				
81	*Lobelia heyneana* Roem. & Schultes		Herb	1400				
82	*Lobelia pyramidalis* Wall.	Eklebir	Herb	1800-2700				
83	*Peracarpa carnosa* (Wall.) Hook. f. & Thoms.		Herb	2200				
84	*Pratia nummuraria* (Lam.) A. Br. & Aschersen	Nilo ghodtapre	Herb	1500-2300				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
85	*Wahlenbergia gracilis* DC.		Herb	1400				
Cannabiaceae								
86	*Cannabis sativa* L.	Bhang, Ganja	Herb	1400				
Capparaceae								
87	*Crataeva narvala* Buch.-Ham.	Siplikan	Tree	1500				
Capparidaceae								
88	*Gynodropsis pentaphylla* DC.		Herb	1500				
Caprifoliaceae								
89	*Leycesteria formosa* Wall.	Patpate	Shrub	2300				
90	*Lonicera angustifolia* Wall. ex DC.		Shrub	2700				
91	*Lonicera ligustrina* Wall.	Masinu kanike	Shrub	1600				
92	*Lonicera macrantha* (D. Don) Spreng.	Ban juhi	Shrub	2700				
93	*Sambucus adnata* Wall. ex DC.		Shrub	1400				
94	*Sambucus hookeri* Rehder	Kanike ful	Shrub or tree	1400				
95	*Viburnum cylindricum* Buch.-Ham. ex D. Don	Ghode khari	Shrub or tree	1500-2100				
96	*Viburnum erubescens* Wall. ex DC.	Ganamane	Shrub or tree	1500-2300				
97	*Viburnum mullaha* Buch.-Ham. ex D. Don	Maulo, Kapase	Shrub	1800				
98	*Viburnum punctatum* Buch.-Ham. ex D. Don		Treee	1500				
Caryophyllaceae								
99	*Cerastium grandiflorum* (Buch.-Ham. ex D. Don) Edgew. & Hook.		Herb	1500				
100	*Cerastium holosteoides* Fries		Herb	1700				
101	*Drymaria cordata (*L.) Willd. ex Schult.		Herb	1700				
102	*Lepyrodiclis glandulosa* (Benth. ex G. Don) H.Ohba		Herb	1400				
103	*Sagina saginoides* (L.) Karsten		Herb	2000				
104	*Stellaria himalayensis* Majumdar		Herb	1400				
105	*Stellaria monosperma* Buch.-Ham. ex D. Don		Herb	2400				
106	*Stellaria patens* D. Don		Herb	1450-2450				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
107	*Stellaria uliginosa* Murray		Herb	1400				
108	*Stellaria vestita* Kurtz		Herb	1500				
Casuarinaceae								
109	*Casuarina stricta* (Dryand) Ait.		Tree	1500				
Celastraceae								
110	*Euonymus echinatus Wall.*		Climbing epiphyte	1900-2600				
111	*Euonymus grandiflorus Wall.*	Sano jure mayal	Shrub or tree	1600				
112	*Euonymus hamiltonianus* Wall.	Ban chitu	Tree	1500				
113	*Euonymus pendulus* Wall.		Shrub or tree	1600				
114	*Euonymus tingens* Wall.	Sim mayu	Shrub or tree	1800				
115	*Euonymus vagans* Wall.		Epiphytic shrub	1600				
116	*Maytenus rufa* (Wall.) Hara		Shrub or tree	1600				
Chenopodiaceae								
117	*Chenopodium ambrosioides* L.	Rato latte	Herb	1300				
Combretaceae								
118	*Combretum chinense* Roxb.		Shrub	1500				
Compositae								
119	*Adenocaulon himalaicum* Edgew.		Herb	2500				
120	*Adenostemma lavenia* (L.) O. Kuntze	Rato danthe ghans	Herb	1300-1500				
121	*Ageratina adenophora* (Spreng.) R.M. King & H. Rob.		Herb	1600-2000				
122	*Ageratum conyzoides* L.	Ganamane ghans	Herb	1500				
123	*Ainsliaea latifolia* (D. Don) Schultes	Shahadeva shahadevi	Herb	1700-2100				
124	*Anaphalis adnata* DC.		Herb	1800				
125	*Anaphalis busua* (Ham.) Hand.-Mazz.		Herb	1800				
126	*Anaphalis contorta* (D. Don) Hook. f.		Herb	1500				
127	*Anaphalis margaritacea* (L.) Benth. & Hook. f.		Herb	2100				
128	*Anaphalis triplinervis* (Sims.) C. B. Clarke		Herb	1800-2700				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
129	*Artemisia dubia* Wall. ex DC.	Tite pati	Herb	1500				
130	*Artemisia japonica* Thunb.	Tite pati	Herb	1800				
131	*Aster tricephalus* C. B. Clarke		Herb	1700				
132	*Bidens bipinnata* L.		Herb	1500				
133	*Bidens biternata* (Lour.) Merr. & Sheriff		Herb	1800				
134	*Blumea aromatica* DC.		Herb	1500				
135	*Blumea balsamifera* DC.		Herb	1400				
136	*Blumea hieracifolia* (D. Don) DC.		Herb	1600				
137	*Blumea lacera* (Burm. f.) DC.		Herb	1700				
138	*Blumea mollis* Merrill		Herb	1500				
139	*Blumea riparia* (Bl.) DC.		Herb	1500				
140	*Caesalia axillaris* Roxb.		Herb	1400				
141	*Carpesium arbotanoides* L.		Herb	1500				
142	*Carpesium nepalense* Less.		Herb	2100				
143	*Centipeda minima* (L.) A. Br. & Asch.		Herb	1500				
144	*Cirsium verutum* (D. Don) Spreng.		Thistle	1300-1500				
145	*Cirsium wallichii* DC.	Thakal	Thistle	1500				
146	*Conyza japonica* (Thunb.) Less.		Herb	1300				
147	*Conyza stricta* Willd.		Herb	1300-1500				
148	*Cotula anthemoides* L.		Herb	1600				
149	*Crassocephalum crepidiodes* (Benth.) S. Moore		Herb	2200				
150	*Dichrocephala integrifolia* (L. f.) O. Kuntze		Herb	1600				
151	*Eclipta prostrata* L.		Herb	1600				
152	*Elephanthopus scaber* L.		Herb	1500				
153	*Emilia sonchifolia* (L.) DC.		Herb	1500				
154	*Erechtites valerianaefolia* DC.		Herb	1400				
155	*Erigeron alpines* L.		Herb	2000				
156	*Erigeron bellidiodes* (D. Don) Benth.		Herb	1700				
157	*Erigeron floribundus* (Kunth) Sch.Bip.		Herb	1300				
158	*Galinsoga ciliata* (Raf.) Blake		Herb	1800				
159	*Galinsoga parviflora* Cav.	Chitlange ghans	Herb	2700				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
160	*Gerbera maxima* (D. Don) Beauv.		Herb	2100				
161	*Gnaphalium hypoleucum* DC.		Herb	1400				
162	*Gnaphalium luteo-album L.*	Kairo jhar	Herb	1400				
163	*Grangea maderspatana* (L.) Poir.		Herb	1500				
164	*Guizotia abyssinica* Cass.		Herb	1500				
165	*Gynura cusimbua* (D. Don) S. Moore		Herb	2000				
166	*Inula cappa* DC.		Shrub	1500-1800				
167	*Inula rubricaulis* Benth. ex C. B. Clarke		Shrub	1800				
168	*Ixeris gracilis* (DC.) Stebbins		Herb	1400				
169	*Ixeris polycephala* Cass.		Herb	1450				
170	*Ixeris sagittarioides* (C. B. Clarke) Stebbins		Herb	2800				
171	*Lactuca macrorhiza* Hook. f.		Herb	2700				
172	*Laggera alata* (D. Don) Schulz.- Bip. ex Oliver		Herb	1400				
173	*Leucomeris spectabilis* D. Don		Herb	1700				
174	*Myriactis nepanesis* Less.		Herb	1500-2400				
175	*Picris hieracioides* L.		Herb	2100				
176	*Rhynchospermum verticillatum* Reinw. ex Blume		Herb	1600				
177	*Saussurea deltoids* (DC.) C. B. Clarke		Herb	2700				
178	*Senecio chrysanthemoides* DC.		Herb	2300				
179	*Senecio densiflorus* Wall. ex DC.		Herb	2000				
180	*Senecio nudicaulis* Buch.-Ham. ex D. Don		Herb	1700				
181	*Senecio triligulatus* Buch.-Ham. ex D. Don		Herb	1700				
182	*Senecio wallichii* DC.		Herb	1700				
183	*Siegesbeckia orientalis* L.		Herb	1400				
184	*Sonchus arvensis* L.		Herb	1500				
185	*Sonchus olearaceus* L.		Herb	1500				
186	*Spillanthus acmella* (L.) Murr.		Herb	1300-2100				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
187	*Spillanthus pseudo-acmella* (L.) Murr.		Herb	1500				
188	*Taraxacum officinale* Weber	Tuki phul	Herb	2000				
189	*Tragopogon gracile* D. Don		Herb	16000				
190	*Tridax procumbens* L.		Herb	1300				
191	*Vernonica cinerea* (L.) Less		Herb	1600				
192	*Vernonica extensa* (Wall.) DC.		Tree	1800				
193	*Vernonica volkmeriaefolia* DC.		Tree	2000				
194	*Vicoa indica* (L.) DC.		Herb	1500				
195	*Wedelia bifora* (L.) DC.		Herb	1800				
196	*Wedelia calendulacea* Less		Herb	1600				
197	*Xanthium strumarium* L.		Herb	1600				
198	*Youngia japonica* (L.) DC.		Herb	1400				
Convolvulaceae								
199	*Ipomea purpurea* (L.) Roth.		Climber	1300				
200	*Ipomea quamoclit* L.		Climber	1300				
201	*Porana grandiflora* Wall.		Climber	2400				
202	*Porana racemosa* Roxb.		Creeping herb	1400				
Coriariaceae								
203	*Coriaria nepalensis* Wall.	Machhino	Shrub	1500				
Cornaceae								
204	*Cornus oblonga* Wall.		Tree	1500				
205	*Toricellia tiliaefolia* DC.		Tree	1500				
Corylaceae								
206	*Carinus viminea* Wall.	Khari	Tree	2000				
207	*Corylus ferox* Wall.		Tree	1700				
Crassualaceae								
208	*Kalanchoe integra* (Medik.) Kuntze		Succulent herb	1300				
Cruciferae								
209	*Capsella bursa-pastoris* (L.) Medikus		Herb	2150				
210	*Cardamine scutata* Thunb.		Herb	1600				
211	*Nasturtium officinale* R. Br. ex Aiton		Herb	2000				
212	*Rorippa dubia* (Persoon) Hara	Tori ghans	Herb	2000				
Cucurbitaceae								
213	*Bryonopsis laciniosa* (L.) Naud.	Shivalingi	Herb	1500				

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214	*Herpetospermum pedunculosum* (Ser.) C. B. Clarke		Herb	2200				
215	*Melothria heterophylla* (Lour.) Cogn.	Bankakri	Climbing herb	2100				
216	*Trichosanthes wallichiana* (Ser.) Wight	Banpharsi, Indraini ko lahara	Climbing herb	2200				
Cuscutaceae								
217	*Cuscuta reflexa* Pl.		Parasitic twinning herb	2300				
Daphniphyllaceae								
218	*Daphniphyllum himalayense* Muell.-Arg.	Rakchan	Tree	1900				
Dipsacaceae								
219	*Dipsacus mitis* D. Don	Mula pat	Herb	2700				
Droseraceae								
220	*Drosera peltata* Sm.	Pamga	Herb	1500				
Elaeagnaceae								
221	*Elaeagnus conferta* Roxb.	Madilo	Shrub	1900				
Elaeocarpaceae								
222	*Elaeocarpus serratus* L.	Rudrakshya	Tree	1500				
223	*Sloanea tomentosa* (Benth.) Rehd. & Wils.		Tree	1700				
Ericaceae								
224	*Gaultheria fragrantissima* Wall.	Dhasingare, Padkine	Shrub	1500-2100				
225	*Lyonia ovalifolia* (Wall.) Drude	Angeri	Tree	1400-2000				
226	*Pieris formosa* (Wall.) D. Don	Gineri	Tree	1700				
227	*Rhododendron arboreum* Sm.	Lali gurans	Tree	1700-2800				
Euphorbiaceae								
228	*Arachne cordifolia* (Decne.) Hurusawa		Shrub	1600				
229	*Chamaesyce hirta* (L.) Mill.	Rato lahare ghans	Prostrate herb	1600				
230	*Chamaesyce prostrata* (Aiton.) Small.	Kanike ghans	Prostrate herb	1700				
231	*Euphorbia heterophylla* L.		Herb	1600				
232	*Euphorbia royleana* Boiss.		Shrub	1600				

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233	*Glochidion velutinum* Wight.		Tree	1300				
234	*Jatropha curcas* L.	Sajiwan	Shrub	1400				
235	*Mallotus nepalensis* Muell. Arg.		Tree	1600				
236	*Mallotus philippinensis* (Lam.) Muelll.-Arg.	Sindure	Shrub or tree	1400				
237	*Mercurialis leiocarpa* Sieb. & Zucc.		Herb	1600				
238	*Phyllanthus clarkei* Hook. f.		Shrub	2100				
239	*Phyllanthus emblica* L.	Amala	Tree	1500				
240	*Phyllanthus niuri* L.	Amala	Herb or shrub	1600				
241	*Phyllanthus parviflorus* Buch.-Ham. ex D. Don	Khareto	Shrub	1900				
242	*Ricinus communis* L.	Ander	Shrub or tree	1600				
243	*Sapium insigne* (Royle) Benth. ex Hook. f.	Khirro	Tree	1400				
244	*Securinega virosa* (Roxb. ex Willd.) Baill.	Sano nundhiki	Shrub or tree	1800				
Fagaceae								
245	*Castanopsis indica* (Roxb.) A. DC.	Dhale katus	Tree	1700				
246	*Castanopsis tribuloides* (Sm.) A. DC.	Musure katus	Tree	1300				
247	*Lithocarpus spicata* (Sm.) Rehd.	Arkhaule	Tree	2000				
248	*Quercus glauca* Thunb.	Phalat	Tree	1900				
249	*Quercus incana* Roxb.	Tikhe banjh	Tree	1900				
250	*Quercus lamellosa* Sm.	Banjh	Tree	2100				
251	*Quercus lanuginosa* D. Don	Banjh	Tree	2000				
252	*Quercus lineata* Bl.		Tree	1800				
253	*Quercus semecarpifolia* Sm.	Khasru	Tree	2500				
Flacourtiaceae								
254	*Xylosma controversum* Clos	Dhade kanda	Tree	1300-1800				
Fumariaceae								
255	*Corydalis chaerophlla* DC.	Okhre ghans	Herb	2400				
256	*Corydalis longipes* DC.		Herb	2300				
257	*Dicentra scandens* (D. Don) Walp.	Bichkane	Trailing herb	2400				

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258	*Fumaria vaillantii* Loisel.	Dhukure	Herb	2150				
Gentianaceae								
259	*Cotylanthera paucisquama* C.B. Clarke		Herb	1800				
260	*Gentiana capitata* Buch.-Ham. ex D. Don	Hans phul	Herb	2100-2700				
261	*Gentiana pedicellata* (D. Don) Wall. ex Griseb		Herb	1700				
262	*Swertia angustifolia* Buch.-Ham. ex D. Don	Chiraito	Herb	1700				
263	*Swertia chirayita* (Roxb.) Karsten	Chiraito	Herb	1700				
264	*Swertia dilatata* C. B. Clarke	Chiraito	Herb	2000				
265	*Swertia nervosa* (D. Don) C. B. Clarke	Chiraito	Herb	2600				
266	*Tripterospermum volubile* (D. Don) Hara		Climbingherb	2100				
Geraniaceae								
267	*Geranium nepalense* Sweet		Herb	1500-2300				
Gesneriaceae								
268	*Aeschynanthus parviflorus* (D. Don) Spreng.		Epiphytic sub-shrub	1600				
269	*Chirita urticaefolia* Buch.-Ham. ex D. Don	Ankhle ghans	Herb	1500-2000				
270	*Coralloidiscus lanuginosus* (DC.) Burt.		Herb	1600				
271	*Didymocarpus cinereus* D. Don		Herb	1500				
272	*Didymocarpus oblongus* Wall. ex D. Don		Herb	2300				
273	*Didymocarpus pedicellatus* R. Br.		Herb	1900				
274	*Didymocarpus villosus* D. Don		Herb	2200				
275	*Lysionotus serrata* D. Don		Epiphytic herb	1300				
276	*Platystemma violoides* Wall.		Herb	2200				
277	*Rhynchoglossum obliquum* Blume		Herb	1400-1700				
Grossulariaceae								
278	*Ribes acuminatum* Wall. ex G. Don	Tanfu	Shrub	2600				
Hippocastanaceae								

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279	*Aesculus indica* Colebr. ex Cambess.) Hook.	Naru, Lekh pangro, Bankhor	Tree	1300				
Hydrangeaceae								
280	*Deutzia staminea* R. Br. ex Wall.		Shrub	1500				
281	*Dichroa febrituga* Lour.	Ganaune pat	Shrub	1500-1900				
282	*Hydrangea anomala* D. Don	Bauni kath	Climber	1800				
283	*Hydrangea heteromalla* D. Don	Phusre kath	Shrub or tree	2700				
284	*Hydrangia aspera* D. Don	Hansaraj, Firfire ghans	Shrub	1700				
Hypericaceae								
285	*Hypericum elodeoides* Choisy		Herb	1600				
286	*Hypericum japonicum* Thunb.		Shrub	1500 -2100				
287	*Norysca cordifolia* (Choisy) Blume		Shrub	1600				
288	*Norysca hookeriana* (Wight & Arnott) Wight		Shrub	2700				
289	*Norysca urale* (Buch.-Ham. ex D. Don) K. Koch		Shrub	2000				
Juglandaceae								
290	*Englehardtia spicata* Blume	Mauwa	Tree	1400				
291	*Juglans regia* L.	Okhar	Tree	1500	NT		P	
Labiatae								
292	*Ajuga lobata* D. Don		Creeping herb	2100				
293	*Ajuga macrosperma* Wall. ex Benth.	Ghole ghans	Prostrate herb	1500				
294	*Anisomeles indica* O. Kuntze	Rato charpate	Herb	1500				
295	*Clinopodium longicaule* Benth.	Pipermint	Slender herb	1400-2300				
296	*Clinopodium umbrosum* (M. B.) C. Koch		Prostrateherb	1300-2000				
297	*Colebrookea oppositifolia* Sm.	Dhusure	Shrub	1300-1400				
298	*Coleus forskholii* (Willd.) Briq.		Herb	1500				

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299	*Colquhounia coccinea* Willd.	Sano tushare	Shrub	1700-2200				
300	*Craniotome versicolor* Reichb.	Batuli silam	Herb	1400-2400				
301	*Dysophylla auricularia* (L.) Blume		Slender herb	1400				
302	*Elsholtzia blanda* (Benth.) Benth.	Ban silam	Herb	1500-2100				
303	*Elsholtzia flava* Benth.	Ban silam	Shrub	2400				
304	*Elsholtzia pilosa* (Benth.) Benth.		Herb	2300				
305	*Elsholtzia stachyodes* (Link) Raizada & H.O. Saxena	Ban silam	Herb	1500				
306	*Elsholtzia strobilifera* (Benth.) Benth.		Herb	2000				
307	*Geniosporum coloratum* (D. Don) O. Kuntze		Herb	1600				
308	*Lamium amplexicaule* L.		Herb	2200				
309	*Leucas cephalotes* (Roth.) Spreng.		Herb	1400				
310	*Leucas ciliata* Benth.	Drona puspa	Herb	2200				
311	*Leucas mollissima* Wall. ex Benth.		Straggling herb	1600				
312	*Leucosceptrum canum* Sm.	Bhusure	Tree	1800-2300				
313	*Melissa flava* Benth.		Herb	1500				
314	*Micromeria biflora* Benth.		Herb	1500-1800				
315	*Mosla dianthera* (Buch.-Ham.) Maxim.		Herb	1300-2100				
316	*Notochaete hamosa* Benth.		Herb	2200				
317	*Ocimum basilicum* L.	Babari phul	Herb	1500				
318	*Orthosiphon incurvus* Benth.		Herb	1400				
319	*Perilla frutescens* (L.) Brit.	Silam	Herb	1300				
320	*Plectranthus mollis (*Ait*.)* Spreng.		Herb	1400				
321	*Pogostemon amaranthoides* Benth.		Herb	2200				
322	*Pogostemon glaber* Benth.	Rudilo	Herb or shrub	1500-2100				
323	*Prunella vulgaris* L.		Herb	2400				

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324	*Rabdosia coesta* (Buch.-Ham.) Kudo		Herb	1500				
325	*Rabdosia lophanthoides* (Buch.-Ham. ex D. Don) Hara	Masinu charpate	Herb	1500				
326	*Rabdosia lophanthoides* (Buch.-Ham. ex D. Don) Hara var. *gerardiana* (Benth.) Hara	Seto silam	Herb	1600				
327	*Rabdosia scrophularioides* Wall.		Herb	2400				
328	*Rabdosia ternifolia* (D. Don) Hara		Shrub	1800				
329	*Salvia coccinea* L.		Herb	1300				
330	*Scutellaria barbata* D. Don		Herb	1400				
331	*Scutellaria discolor* Colebr.	Nilo butte ghans	Herb	1500-2000				
332	*Scutellaria quadrifarium* Buch.-Ham. ex D. Don	Kalo rudilo	Herb	1500				
333	*Scutellaria repens* Buch.-Ham. ex D. Don		Herb	1500				
334	*Scutellaria scandens* D. Don		Under shurb	1800				
Lardizabalaceae								
335	*Holboellia latifolia* Wall.	Guphala	Climber	1400				
Lauraceae								
336	*Actinodaphne reticulata* Meisn.		Tree	2500				
337	*Cinnamomum camphora* (L.) Sieb.	Kapur	Cultivated but naturalised Tree	2100				
338	*Cinnamomum caudatum* Nees		Tree	1600				
339	*Cinnamomum glanduliferum* (Wall.) Meisn		Tree	1400				
340	*Cinnamomum tamala* (Buch.-Ham.) Nees & Eberm.		Tree	1500				
341	*Dodecadenia grandiflora* Nees		Tree	2600				
342	*Lindera nacusua* (D. Don) Merrill		Tree	1500-2100				
343	*Lindera neesiana* (Nees) Kurtz	Siltimur	Tree	1800				
344	*Lindera pulcherrima* (Nees) Benth. ex Hook. f.	Phusre	Tree	2600				
345	*Litsea cubeba* (Lour.) Pers.		Tree	1500				
346	*Litsea doshia* (Buch.-Ham. ex D. Don) Kosterm.	Paheli	Tree	1500				

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347	*Litsea lancifolia (*Roxb. ex Nees) Hook.f.		Tree	1300-2500				
348	*Litsea sericea* (Wall. Ex Nees) Hook. f.	Paheli	Tree	2200				
349	*Machilus duthiei* King		Tree	2100				
350	*Machilus gamblei* King ex Hook. f.	Kathe kaulo	Tree	1300-1800				
351	*Machilus gammieana* King		Tree	2100				
352	*Neolitsea cuipala* (D. Don) Kosterm.		Tree	1300				
353	*Neolitsea umbrosa* (Nees) Gamble		Tree	1400				
354	*Persea odoratissima* (Nees) Kosterm.	Gobre kaulo, Kaulo	Tree	1500				
355	*Persea pallida* (Nees) Oliv.		Tree	1600				
356	*Phoebe lanceolata* (Nees) Nees		Tree	1600				
357	*Phoebe paniculata* (Nees) Nees		Tree	1300				
Leguminosae								
358	*Albizia mollis* Boiv.	Siris	Tree	1500				
359	*Amphicarpaea bracteata* (L.) Fernald	Tanki	Twining herb	2000				
360	*Apios carnea* (Wall.) Benth. ex Baker		Climber	2000				
361	*Astragalus khasianus* Benth. ex Bunge		Shrub	2200				
362	*Astragalus stipulatus* Don ex Sims.		Herb	2400				
363	*Atylosis mollis* Benth.		Twining herb	1600				
364	*Atylosis volubilis* (Blanco) Gamble		Twining herb	1600				
365	*Bauhinia retusa* Roxb.		Tree	1500				
366	*Bauhinia variegata* L.	Koiralo	Tree	1500				
367	*Butea monosperma* (Lamark.) Taub.		Tree	1300				
368	*Caesalpinia decapetala* (Roth.) Alston	Arilo kanda	Shrub or climber	2000				
369	*Cassia fistula* L.	Rajbrikshy, Amaltas	Tree	1400				
370	*Cassia floribunda* Cav.		Shrub	1700				
371	*Cassia mimosoides* L.	Amala jhar	Shrub	1800				

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372	*Cassia occidentalis* L.	Powar	Shrub	1400				
373	*Cassia tora* L.	Chakra mandi, Tapre	Shrub	1400				
374	*Cochlianthus gracilis* Benth.	Khosre laharo	Twining herb	2300				
375	*Codariocalyx motorium* (Houtt.) Ohashi		Shrub	1700				
376	*Crotalaria albida* Heyne ex Roth.	Bhendi phul	Shrub	1800				
377	*Crotalaria bialata* Schrank		Shrub	1800				
378	*Crotalaria cystisoides* Roxb. ex DC.	Silsile	Shrub	2000				
379	*Crotalaria nana* Burm.f.		Herb	1500				
380	*Crotalaria sessiliflora L.*		Herb	1400				
381	*Crotalaria spectabilis Roth.*	Chin chine	Shrub	2000				
382	*Desmodium concinnum* DC.		Shrub	1900				
383	*Desmodium confertum* DC.		Shrub	1600				
384	*Desmodium elegans* DC.		Shrub	2000				
385	*Desmodium floribumdum* G. Don	Bhatmase	Shrub	2100				
386	*Desmodium gangeticum* (L.) DC.		Shrub	1600				
387	*Desmodium heterocarpon* (L.) DC.		Shrub	1300-1800				
388	*Desmodium laxiflorum* DC.		Shrub	1600				
389	*Desmodium microphyllum* DC.	Bute kanike	Shrub	1350				
390	*Desmodium oxyphyllum* DC.	Gahare ghans	Herb	1500				
391	*Desmodium sequax* Wall.		Shrub	2000				
392	*Desmodium triflorum* (L.) DC.		Herb or shrub	1350				
393	*Eriosema himalaicum* Ohashi		Herb or shrub	1800				
394	*Erythrina arborescens* Roxb.	Kimsuka phul	Shrub or tree	1600				
395	*Flemingia macrophylla* (Willd.) Merr.		Shrub	1500				
396	*Flemingia strobilifera* (L.) W.T. Ait.		Herb	2000				
397	*Indigofera bracteata* Grah. ex Baker		Herb or shrub	2400				

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398	*Indigofera cylindracea* Wall. ex Baker	Rato mirmire, Phusro ghans	Shrub	1800				
399	*Indigofera dosua* Buch. Ham. ex D. Don		Shrub	1500				
400	*Indigofera hebepetala* Benth. ex Baker		Shrub	2100				
401	*Lathyrus aphaca* L.	Bahabulba	Herb	1500				
402	*Lathyrus sativus* L.	Khesari	Herb	1500				
403	*Lespedeza eriocarpa* DC.		Shrub	1700				
404	*Lotus corniculatus* L.	Khesari	Herb	1500				
405	*Meliotus albus* Medikus ex Desr.		Herb	1700				
406	*Mimosa rubicaulis* Lamarck.	Boksi ghans	Shrub	1500				
407	*Parochetus communis* Buch.-Ham. ex D. Don	Jangali badame jhar, Chungi phul	Herb	2100-2600				
408	*Piptanthus nepalensis* (Hook.) D. Don		Shrub	2500				
409	*Pueraria peduncularis* (Benth.) Grah. ex Benth.		Twinning herb	2300				
410	*Shuteria involucrata* (Wall.) Wight & Arn.		Climber	1900				
411	*Smithia sensitiva* Ait.		Herb or under shrub	1300				
412	*Trifolium pratens* L.		Herb	1800				
413	*Trifolium repens* L.		Herb	2400				
414	*Uraria lagopus* DC.		Shrub	1800				
415	*Vicia hirsuta* (L.) S. F. Gray	Munmun, Akata	Herb	1500				
416	*Vigna vexillata* (L.) A. Rich.		Herb	2000				
Lentibulariaceae								
417	*Utricularia aurea* Lour.		Aquatic herb	1500				
418	*Utricularia bifida* L.		Herb	2100				
419	*Utricularia caerulea* L.		Herb	1300				
420	*Utricularia scandens* Benj.		Herb	1300				
421	*Utricularia striatula Sm.*		Herb	1600				

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Linaceae								
422	*Anisadenia saxitilis* Wall.		Herb	1800				
423	*Reinwardtia indica* Dumortier	Pyauli, Bakhre ghans	Herb to shrub	1600				
Loganiaceae								
424	*Buddleja asiatica* Lour.	Bhimsen pati	Shrub or tree	1800				
425	*Buddleja paniculata* Wall.	Narayan pati	Shrub or tree	1800				
Loranthaceae								
426	*Helixanthera ligustrina* (Wall.) Danser	Ainjeru	Semiparasitic shrub	1400				
427	*Loranthus odoratus* Wall.	Ainjeru	Parasitic shrub	1500				
428	*Loranthus pentapetalus* Roxb.	Ainjeru	Semiparasitic shrub	1600				
429	*Scurrula elata* (Edgew.) Danser	Ainjeru	Parasitic shrub	2400				
430	*Scurrula parasitica* L.		Parasitic shrub	2100				
431	*Scurrula pulverulenta* (Wall.) G. Don	Ainjeru	Parasitic shrub	1400				
432	*Taxillus umbellifer* (Schult.f.) Danser		Parasitic shrub	1800				
433	*Viscum album* L.	Hadchur	Parasitic shrub	2100				
434	*Viscum articulatum* Burm. f.	Hadchur	Parasitic shrub	2100				
Lythraceae								
435	*Ammania auriculata* Willd.		Herb	1400				
436	*Cuphea procumbens* Cav.		Herb	1500				
437	*Rotala indica* (Willd.) Koehne		Herb	1400				
438	*Rotala rotundifolia* (Roxb.) Koehne		Herb	1800				
439	*Woodfordia fructicosa* (L.) Kurtz	Amar phul, Dhayaro	Shrub	1600				
Magnoliaceae								
440	*Magnolia grandiflora L.*	Rukh kamal	Tree	1400				
441	*Michelia champaca L.*	Sun Champ	Tree	1300				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
442	*Michelia doltsopa* Buch.-Ham. ex DC.	Champ	Tree	2400				
443	*Michelia kisopa* Buch.-Ham. ex DC.	Seto Champ	Tree	1300				
444	*Michelia velutina* DC.		Tree	1300				
445	*Talauma hodgsonii* Hook. f. & Thoms.		Tree	1800		III		
Malvaceae								
446	*Gossypium herbaceum* L.	Kapas	Shrub	1500				
447	*Hibiscus manihot* L.	Ban lasun	Herb	2000				
448	*Malva sylvestris* L.		Shrub	1500				
449	*Sida rhombifolia* L.	Sano chillya	Herb	1500				
450	*Urena lobata* L.	Nalu kuro	Shrub	1500				
Melastomataceae								
451	*Melastoma malabathricum L.*		Herb	1500-1800				
452	*Melastoma normale* D. Don		Shrub	1500				
453	*Osbeckia chinensis L.*	Chulsi	Herb	1900				
454	*Osbeckia nepalensis* Hook.	Seto chulsi	Shrub	1500				
455	*Osbeckia rostrata* D. Don	Rato chulsi	Herb	2500				
456	*Osbeckia stellata* D. Don	Rato chulsi	Shrub	1500				
457	*Oxyspora paniculata* (D. Don) DC.		Shrub	1500				
Meliaceae								
458	*Amoora decandra* Hiern	Lahare lalgedi	Tree	2000				
459	*Cedrela toona* Roxb. & Rottl.	Tooni	Tree	1400				
460	*Chikrassia tabularis* A. Juss.		Tree	1500				
461	*Melia axederach* L.	Bakaino	Tree	1400				
462	*Walsura trijuga* (Roxb.) Kurz	Aankh Taruwa	Tree	1500				
Menispermaceae								
463	*Cissampelos pareira* L.	Batule pat	Climber	1800				
464	*Cocculus laurifolia* DC.		Shrub or Tree	1500				
465	*Stephania elegans* Hook. f. & Thoms.	Batule pat	Climber	1500				
466	*Stephania glandulifera* Miers.	Gurjo	Climber	2100				

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467	*Stephania japonica* (Thunb.) Miers		Shrub or climbing shrub	1500				
468	*Tiliacora acuminata* (Lamk.) Miers.	Rukh kane	Climbing shrub	1500				
Monotropaceae								
469	*Monotropa uniflora* L.		Herb	1700				
Moraceae								
470	*Ficus benghalensis* L.	Bar	Tree	1500				
471	*Ficus elastica* L.	Rabar	Tree	1400				
472	*Ficus hederacea* Roxb.		Scandent shrub	1400				
473	*Ficus neriifolia* J.E. Sm.	Dudhilo	Tree	1400				
474	*Ficus religiosa* L.	Pipal	Tree	1400				
475	*Ficus sarmentosa* Buch.-Ham. ex J. E. Sm.	Ban timila	Climber	1300				
476	*Maclura cochinchinensis* (Lour.) Corner	Damaru, Dewar	Tree	1800				
477	*Morus alba L.*	Kimbu	Tree	1800				
Myricaceae								
478	*Myrica esculenta* Ham. ex D. Don	Kaphal	Tree	1500				
Myrsinaceae								
479	*Ardisia macrocarpa* Wall.		Shrub	1500-2100				
480	*Embelia nagushia* D. Don	Amilo ghans	Climber or small tree	1800				
481	*Maesa chisia* Buch.-Ham. ex D. Don	Bilauni	Shrub or tree	1800				
482	*Maesa macrophylla* (Wall.) A. DC.	Paha phal	Shrub	1500-2400				
483	*Myrsine africana* L.		Shrub	1500				
484	*Myrsine capitellata* Wall.	Seti kath	Tree	1500				
485	*Myrsine semiserrata* Wall.	Kali kath	Tree	1500-2700				
Myrtaceae								
486	*Syzygium cumini* (L.) Skeel		Tree	1500				
Nyctaginaceae								
487	*Mirabilis jalapa* L.		Herb	1300				
Oleaceae								
488	*Fraxinus floribunda* Wall.	Lankuri	Tree	1500-2000				

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489	*Jasminum dispermum* Wall.	Lahare jai	Climbing shrub	1800				
490	*Jasminum heterophyllum* Roxb.	Ban jai	Shrub	1500				
491	*Jasminum humile* L.	Jai	Shrub	1500				
492	*Jasminum officinale* L.		Climbing shrub	2700				
493	*Ligustrum confusum* Decaisne	Kanike phul	Shrub	2100				
494	*Ligustrum indicum* (Lour.) Merril	Kanike phul	Shrub	1300				
495	*Nyctanthes arbor-tristis L.*	Parijat	Shrub or tree	1600				
496	*Osmanthus fragrans* Lour.	Siringe	Tree	1300-2100				
Onagraceae								
497	*Circaea alpina* L. *subsp. imaicola* (Asch. & Magnus) Kitam.		Herb	2200				
498	*Epilobium cylindricum* (D. Don) C. B. Clarke		Herb	1600				
499	*Oenothera rosea* Ait.		Herb	1600				
Orobranchaceae								
500	*Aeginetia indica* L.		Parasitic herb	1400				
501	*Orobanche caerulescens* Stapf. ex Willd.		Parasitic herb	1700				
Oxalidaceae								
502	*Oxalis corniculata* L.	Chari amilo	Creeping herb	2000				
503	*Oxalis latifolia* Humb.	Thulo chari amilo	Herb	1400				
Papavaraceae								
504	*Argemone mexicana* L.	Thakal	Herb	1400				
Pedaliaceae								
505	*Sesamum indicum* L.		Herb	1300				
Phrymaceae								
506	*Phryma leptostachya L.*		Herb	1600				
Phytolaccaceae								
507	*Phytolacca acinosa* Roxb.	Jaringo	Herb	2400				
Piperaceae								
508	*Peperomia tetraphylla* (Forst. f) Hook. & Arn.		Epiphytic herb	2300				

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509	*Piper peepuloides* Roxb.	Pipla	Climber	2000				
Pittosporaceae								
510	*Pittosporum napaulense* (DC.) Rehder & Wilson		Medium sized tree	1400				
Plantaginaceae								
511	*Plantago major* L.	Isabgol	Herb	1500-2100				
Plumbaginaceae								
512	*Plumbago zeylanica* L.	Chitu	Herb or shrub	1600				
Polygalaceae								
513	*Polygala arillata* Buch-Ham. ex D. Don	Luiche phool	Shrub	2700				
514	*Polygala crotalarioides* Buch-Ham. ex D. Don		Herb	1500				
515	*Polygala persicariaefolia* DC.		Herb	1800				
516	*Polygala triphylla* Buch-Ham. ex D. Don	Phapare ghans	Herb	1500				
517	*Salomonia cantoniensis* Lour.	Methi ghans	Herb	1700				
Polygonaceae								
518	*Fagopyrum dibotrys* (D. Don) Hara		Herb	1300				
519	*Fagopyrum esculentum* Moench	Phapar	Herb	1300				
520	*Persicaria hydropiper* (L.) Spach	Pire jhar	Herb	1300				
521	*Persicaria microcephala* (D. Don) H. Gross	Thulo ratnaule	Shrub	1500				
522	*Persicaria nepalensis* (Meisn.) H. Gross	Thulo ratnaulo	Herb	1500				
523	*Persicaria perfoliata* (L.) H. Gross		Climber	1300				
524	*Persicaria posumbu* (Buch.-Ham. ex D. Don) H. Gross	Seto pire ghans	Herb	1500				
525	*Persicaria pubescens* (Blume) Hara		Herb	1800-2100				
526	*Persicaria runcinata (*Buch.-Ham. ex D. Don) H. Gross		Herb	2000				
527	*Persicaria viscosa* (Buch.-Ham. ex D. Don) Nakai		Herb	1500				
528	*Polygonum amplexicaule* D. Don	Ratnaule jhar	Herb	1800				

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529	*Polygonum campanulatum* Hook. f.	Rapate ghans	Herb	2800				
530	*Polygonum capitatum* Buch.-Ham.ex D. Don	Ratnaulo	Herb	2500				
531	*Polygonum chinense* L.	Kukur thotne	Shrub	2100				
532	*Polygonum molle* D. Don	Thotne	Shrub	2000				
533	*Polygonum plebeium* R. Br.		Shrub	1800				
534	*Polygonum sphaerocephalum* Wall. ex Meisn.		Trailing herb	1500				
535	*Rumex nepalensis* Spreng.	Halhale	Herb	2000				
Portulaceae								
536	*Portulaca olearacea* L.		Herb	1400				
Primulaceae								
537	*Anagalis arvensis* L.		Herb	1400				
538	*Androsace saxifragaefolia* Bunge		Herb	1500				
539	*Lysimachia alternifolia* Wall.	Butte ghans	Herb	1500-2100				
540	*Lysimachia debilis* Wall.		Herb	1500				
541	*Lysimachia evalvis* Wall.		Herb	1700				
542	*Lysimachia pyramidalis* Wall.		Herb	1300-1500				
543	*Primula denticulata* Sm.		Herb	2100				
544	*Primula filipes* Watt		Herb	2300				
545	*Primula petiolaris* Wall.		Herb	2100				
Proteaceae								
546	*Grevillea robusta* A. Cunn. ex R. Br.	Kainyo phul	Tree	1300				
Ranunculaceae								
547	*Aconitum ferox* Wall. ex. Seringe	Bikh	Herb	2100				
548	*Anemone elongata* D. Don		Herb	2300				
549	*Anemone rivularis* Ham. ex DC.	Seto bikh	Herb	2100				
550	*Anemone vitifolia* Ham. ex DC.		Herb	2200				
551	*Clematis acuminata* DC.		Climber	2000				
552	*Clematis buchananiana* DC.	Junge lahara	Climber	1800				
553	*Clematis connata* DC.		Climber	2400				
554	*Clematis gouriana* Roxb.	Junge lahara	Climber	1800				

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555	*Clematis grewiaeflora* DC.		Climber	1500 to 1800				
556	*Clematis montana* Buch.-Ham. ex DC.	Junge lahara	Climber	1800				
557	*Clematis smilacifolia* Wall.		Climber	1500				
558	*Clematis tortuosa* Wall. ex Fischer		Climber	1800				
559	*Delphinium altissimum* Wall.	Bishadi ghans	Herb	1400				
560	*Delphinium denudatum* Wall. ex Hook. f.		Herb	1400				
561	*Delphinium stapeliosum* Bruhl.		Herb	2700				
562	*Rannunculus diffusus* DC.	Sano saro	Herb	1600				
563	*Rannunculus muricatus* L.		Herb	1400				
564	*Rannunculus scleratus* L.		Herb	1400				
565	*Thalictrum chelidonii* DC.		Herb	2200				
566	*Thalictrum folliolosum* DC.	Dampate	Herb	1900 to 2200				
567	*Thalictrum javanicum* Blume		Herb	2500				
568	*Thalictrum minus* (L.) DC.		Herb	2200 to 2700				
569	*Thalictrum virginatum* Hook. f. & Thoms.		Herb	2400				
Rhamnaceae								
570	*Berchemia floribunda* (Wall.) Brongniart		Shrub	2200				
571	*Gouania nepalensis* Wall.		Climber	1800				
572	*Rhamnus nepalensis* Wall. ex Lawson	Chile kath	Shrub	1500				
573	*Rhamnus persicus* Boiss.		Shrub	2600				
574	*Rhamnus virgatus* Roxb.	Kande paiyu	Shrub or tree	2000				
575	*Sageretia oppositifolia* (Wall.) Brongn.		Shrub or tree	1900				
576	*Ziziphus incurva* Roxb.	Hade bayar	Tree	1300-1500				
577	*Ziziphus mauritiana* Lam.	Bayar	Tree	1500				
Rosaceae								
578	*Agrimonia pilosa* Ledeb. var. *nepalensis* Ledeb.		Herb	1600-2300				

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579	*Cotoneaster acuminatus* Wall. ex Lindl.	Dhalke phul	Shrub	2700				
580	*Cotoneaster affinis* Lindl.	Kause phul	Shrub	2800				Endemic to Nepal
581	*Cotoneaster microphyllus* Wall. ex Lindl.		Shrub	2000				
582	*Duchesnea indica* (Andr.) Focke	Sarpa ko kaphal	Herb	1400				
583	*Eriobotrya dubia* Decne.	Jure kaphal	Tree	1700				
584	*Eriobotrya elliptica* Lindl.	Maya	Tree	2000				
585	*Eriobotrya japonica* Lindl.		Tree	1400				
586	*Niellia thyrsiflora* D. Don		Shrub	2300				
587	*Photinia integrifolia* Lindl.	Gaja phul	Tree	1700-2800				
588	*Potentillia fulgens* Wall.	Bajradanti	Herb	2400				
589	*Potentillia kleiniana* Wight.	Bajradanti	Herb	2200				
590	*Prinsepia utilis* Royle	Dhatelo	Shrub	2000				
591	*Prunus carmesina* Hara	Jangali paiyun	Tree	2400				
592	*Prunus cerasoides* D. Don	Ban paiyun	Tree	1700-2600				
593	*Prunus nepalensis* (Ser.) Steudel		Tree	1800-2400				
594	*Prunus wallichii* Steudel	Khosini	Tree	2700				
595	*Pyracantha crenulata* (D. Don) Roemer	Ghangaru	Shrub	1400				
596	*Pyrus pashia* Buch.- Ham. ex D. Don	Mayal	Tree	1600				
597	*Rosa brunonii* Lindl.	Mayal	Shrub	1600				
598	*Rubus acuminatus* Sm.		Shrub	2200				
599	*Rubus biflorus* Buch.- Ham. ex Sm.	Sano gulaf	Shrub	2200				
600	*Rubus calicynus* Wall. ex D. Don	Bhuin ainselu	Herb	2000				
601	*Rubus ellipticus* Sm.	Ainselu	Shrub	1600				
602	*Rubus foliolosus* D. Don	Kalo ainselu	Shrub	1600				
603	*Rubus paniculatus* Sm.	Kalo ainselu, Rukh ainselu	Climber	1800-2300				
604	*Rubus pentagonus* Wall. ex Focke		Shrub	2000				

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605	*Rubus rugosus* Sm.	Goru ainselu	Shrub	2000				
606	*Sorbus cuspidata* (Spach) Hedlund		Tree	2600				
607	*Spiraea bella* Sims	Seto khareto	Shrub	1600				
608	*Spiraea micrantha* Hook. f.		Shrub	1600				
609	*Spiraea vaccinifolia* D. Don		Shrub	2600				
610	*Stranvaesia nussia* (D. Don.) Decne.	Jure mayal	Tree	1600				
Rubiaceae								
611	*Anthocephalus cadamba* Miq.	Kadam,	Tree	1400				
612	*Argostemma sarmentosum* Wall.	Satuwa ghans	Herb	1800				
613	*Galium acutum* Edgew.		Prostrate herb	2000				
614	*Galium aparine L.*		Climbingherb	2000				
615	*Galium asperifolium* Wall. ex Roxb.		Herb	1600				
616	*Galium elegans* Wall. ex Roxb.		Herb	1700				
617	*Galium hirtifolium* Req. ex DC.		Herb	1800				
618	*Hedyotis corymbosa* (L.) Lamark		Herb	1400				
619	*Hedyotis diffusa* Willd.		Herb	1400				
620	*Hedyotis gracilis* Wall.		Herb	2000				
621	*Hedyotis lineata* Roxb.		Herb	1400				
622	*Hedyotis paniculata* (L.) Dence. ex Kurtze		Herb	1600				
623	*Hedyotis scandens* Roxb. ex D. Don	Dudhe laharo	Climber	1500-1900				
624	*Hymenopogon parasiticus* Wall.	Gabre kath	Epiphytic shrub	2200				
625	*Leptodermis lanceolata* Wall.		Shrub	1800				
626	*Luculia gratissima* (Wall.) Sweet		Shrub	1300-2100				
627	*Mussaenda macrophylla* Wall.	Dhobini	Shrub	1300				
628	*Mussaenda roxburghii* Hook. f.		Shrub	1300				
629	*Mussaenda treutleri* Stapf.	Dhobini	Shrub	1500				
630	*Neanotis gracilis* (Hook. f.) W. H. Lewis		Herb	2300				
631	*Neanotis ingrata* (Wall. ex Hook. f.) W. H. Lewis	Pani ghans	Herb	1500				
632	*Ophiorrhiza fasciculata* D. Don		Herb	1400				

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633	*Ophiorrhiza prostrata* D. Don		Herb	1800				
634	*Ophiorrhiza thomsonii* Hook. f.		Herb	1600				
635	*Paederia scandens* (Lour.) Merril.		Twinning shrub	1600				
636	*Randia tetrasperma* (Roxb.) Brandis		Shrub	2100				
637	*Rubia manjith* Roxb. ex Fleming	Majitho	Climbing herb	1500-2300				
638	*Spermadicton suaveolens* Roxb.		Shrub	1600				
639	*Wendlandia coriacea* DC.		Small tree	1500				
640	*Wendlandia puberula* DC.		Small tree	1600				
Rutaceae								
641	*Aegle marmelos* (L.) Correa	Bel	Tree	1400				
642	*Boenninghausenia albiflora* (Hook.) Meisner		Herb	2700				
643	*Murrya exotica* L.	Kamini	Shrub to tree	1400				
644	*Skimmia arborescens* T. and ex. Gamble		Shrub to tree	1800				
645	*Skimmia melanocarpa* Rehd. & E.H. Wilson		Tree	2500				
646	*Toddalia asiatica* (L.) Lam		Shrub	1400				
647	*Zanthoxylum armatum* DC.	Timur	Shrub	1400-1600				
648	*Zanthoxylum oxyphyllum* Edgew.	Ban timur	Shrub	2300				
Sabiaceae								
649	*Meliosma dilleniifolia* (Wall.) Walp.		Shrub or tree	2000				
650	*Meliosma pungens* (Wall.) Walp.		Tree	2000				
651	*Meliosma simplicifolia* (Roxb.) Walp.		Tree	1500				
652	*Sabia campanulata* Wall. ex Roxb.		Climbing shrub	2000				
653	*Sabia purpurea* Hook. f. & Thoms.		Climbing shrub	2100				
Salicaceae								
654	*Salix babylonica* L.	Bains	Tree	1600				
655	*Salix elegans* Wall. ex Anders.		Shrub or tree	2300				
656	*Salix tetrasperma* Roxb.	Bains	Tree	1700				

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657	*Salix wallichiana* Anderson		Shrub or tree	1700				
Santalaceae								
658	*Osyris wightiana* Wall. ex Wight	Nun dhiki	Shrub or tree	1600				
659	*Pyrularia edulis* (Wall.) DC		Tree	1300				
Sapindaceae								
660	*Sapindus mukorossi* Geartn.	Rittha	Tree	1400				
Sapotaceae								
661	*Bassia butyracea* Roxb.	Chiuri	Tree	1400				
Saurauiaceae								
662	*Saurauia napaulensis* DC.	Gogan	Tree	1800				
Saururaceae								
663	*Houttuynia cordata* Thunb.	Gane	Herb	1900				
Saxifragaceae								
664	*Astilbe rivularis* Buch.-Ham. ex D. Don	Budho okhati	Herb	2600				
665	*Bergenia ciliata* (Haw.) Sternb.	Pakhan ved	Herb	2400				
666	*Chrysoplenium nepalense* D. Don		Herb	2500				
667	*Saxifraga diversifolia* Wall. ex Seringe		Herb	2700				
668	*Tiarella polyphylla* D. Don	Sisne jhar	Herb	2600				
Schisandraceae								
669	*Schisandra grandiflora* (Wall.) Hook. f. & Thoms.	Theki phal	Climber	2500				
670	*Schisandra propinqua* (Wall.) Baill.	Pahenlo singalto	Climber	2000				
Scrophulariaceae								
671	*Centranthera nepalensis* D. Don		Herb	1700				
672	*Hemiphragma heterophyllum* Wall.		Prostrate herb	2300				
673	*Lindenbergia grandiflora* (Buch.-Ham. Ex D. Don) Benth.	Bhendi phul	Rambling herb	1500-1800				
674	*Lindenbergia indica* (L.) O. Kuntze		Herb	1500				
675	*Majus dentatus* Wall. ex Benth.		Herb	1300				
676	*Majus japonicus* (Thunb.) O. Kuntze		Herb	1300				

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677	*Majus surculosus* D. Don		Creeping herb	1600-2000				
678	*Mimulus nepalensis* Benth.		Herb	2100				
679	*Pedicularis gracilis* Wall. ex Benth.		Herb	2100				
680	*Scrophularia urticaefolia* Wall. ex Benth.	Mokhi ghans	Herb	2300				
681	*Torenia cordifolia* Roxb.		Herb	1500				
682	*Torenia diffusa* D. Don		Herb	1500-2300				
683	*Veronica cana* Wall. ex D. Don		Herb	2000				
684	*Veronica javinca* Bl.		Herb	1300				
685	*Wightia speciosissima* (D. Don) Merril		Epiphyticclimbingherb	1300				
Simaroubaceae								
686	*Picrasma quassioides* (Don) Benn.	Nim kath	Shrub or tree	2100				
Solanaceae								
687	*Cestrum elegans* Schlecht		Shrub	1600				
688	*Cestrum nocturnum* L.	Hasina	Shrub	1600				
689	*Cestrum parqui* L'Herit		Shrub	1400				
690	*Datura metel* L.	Kalo dhaturo	Herb or shrub	1500				
691	*Datura stramonium* L.	Dhaturo	Herb or shrub	1300				
692	*Datura suaveolens* Humb. & Bonpl. ex Willd.	Dhaturo	Herb	1500				
693	*Hyoscyamus niger* L.	Bajar bhang	Herb	1800				
694	*Nicandra physaloides* Gaertn.		Herb	1300				
695	*Nicotiana plumbaginifolia* Viviani	Kancho paat	Herb	1400				
696	*Nicotiana tabacum* L.	Surti, Kancho paat	Herb	1400				
697	*Physalis peruviana* L.	Jangali mewa	Herb	1400				
698	*Solanum aculeatissimum* Jacq.		Herb or shrub	1300				
699	*Solanum crassipetalum* Wall.	Ban bihi	Shrub	1400				
700	*Solanum indicum* L.	Bihi	Herb or shrub	1600				
701	*Solanum nigrum* L.	Bihi	Herb	1700-2000				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
702	*Solanum pseudo-capsicum* L.		Herb	1700				
703	*Solanum torvum* Swartz	Thulo bihi	Shrub	1500				
704	*Solanum verbascifolium L.*		Shrub	1500				
Stachyuraceae								
705	*Stachyurus himalaicus* Hook. & Thoms. ex Benth.	Chunitro, Seto bhasak	Shrub	1800				
Staphyleaceae								
706	*Turpinia nepalensis* Wall. ex Wight & Arn.		Tree	1600				
Symplocaceae								
707	*Symplocos crataegoides* Buch.-Ham. ex D. Don	Lodh	Tree	2300				
708	*Symplocos phyllocalyx* C. B. Clarke		Tree	2500				
709	*Symplocos purifolia* Wall. ex G. Don	Seto birauli	Tree	1500-2300				
710	*Symplocos ramosissima* Wall. ex G. Don	Kharane	Tree	2000				
711	*Symplocos sumuntia* Buch.-Ham. ex D. Don	Hakulal	Tree	2100				
712	*Symplocos theaefolia* D. Don	Bakal pate, Ghole	Tree	2200				
Theaceae								
713	*Actinidia callosa* Lindl.		Trailing shrub	1700				
714	*Camellia kissi* Wall.	Chiapate, Hinguwa	Shrub or tree	1500-2200				
715	*Cleyera ochnacea* DC.	Bakal pate	Tree	1500-2200				
716	*Eurya acuminata* DC.	Jhingane	Tree	1400-2300				
717	*Eurya cerasifolia* (D. Don) Kobuski		Tree	2000-2200				
718	*Eurya japonica* Thunb.		Shrub or tree	1700				
719	*Schima wallichii* (DC.) Korth.	Chilaune	Tree	1500-2100				
Thymelaeaceae								
720	*Daphne bholua* Buch.-Ham. ex D. Don	Kagat pate	Shrub	2200				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
721	*Diplomorpha canescens* (Meissn.) C.A. Meissner	Phurke pate	Shrub	2200				
722	*Edgeworthia gardneri* (Wall.) Meissner	Argeli	Shrub	2200				
Tiliaceae								
723	*Grewia asiatica* L.		Tree	1500				
724	*Grewia oppositifolia* Ham. ex Roxb.	Syal phusre	Tree	1600				
725	*Triumfetta annua* L.		Herb	1400				
726	*Triumfetta bartramia* L.		Shrub	1500				
727	*Triumfetta pilosa* Roth.	Ban kuro	Herb	1400				
Ulmaceae								
728	*Celtis australis* L.	Khari	Tree	1500				
Umbelliferae								
729	*Archangelica officinalis* var. *himalaica* C.B. Clarke		Herb	2200				
730	*Bupleurum tenue* Buch.-Ham. ex D. Don		Herb	1600				
731	*Centella asiatica* (L.) Urban		Herb	1500				
732	*Chaerophyllum reflexum* Lindl.		Herb	2700				
733	*Heracleum candicans* Wall. ex DC.		Herb	2400				
734	*Heracleum nepalense* D. Don		Herb	2600				
735	*Hydrocotyl podantha* Molkenboer		Herb	2000				
736	*Hydrocotyle nepalensis* Hook.		Herb	1600-2100				
737	*Hydrocotyle sibthorpioides* Lamarck		Herb	1400				
738	*Oenanthe linearis* Wall. ex C.B. Clarke		Herb	1400				
739	*Pimpinella diversifolia* DC.	Bhooke phul	Herb	2700				
740	*Pleurospermum benthami* (DC.) C.B. Clarke		Herb	2200				
741	*Sanicula elata* Buch.-Ham. ex D. Don.		Herb	1400-2400				
742	*Selinum tenuifolium* Wall. ex C. B. Clarke		Herb	1600-2600				
743	*Vicatia coniifolia* DC.		Herb	2000				
Urticaceae								
744	*Boehmeria hamiltoniana* Wedd.		Shrub	1800				
745	*Boehmeria platyphylla* D. Don	Gargalo	Shrub	1500				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
746	*Boehmeria rugulosa* Wedd.	Getha	Tree	1600				
747	*Boehmeria ternifolia* D. Don		Shrub or tree	1500				
748	*Debregeasia longifolia* (Burm. f.) Wedd.	Tushare	Shrub or tree	1500				
749	*Elatostema lineolatum* Wight		Herb	2000				
750	*Elatostema platyphyllum* Wedd.	Sano gagleto	Herb	1500				
751	*Elatostema pusillum* C.B. Clarke		Herb	2200				
752	*Elatostema sessile* Forster		Herb	2500				
753	*Girardinia diversifolia* (Link) Friis	Bhangre sisnu	Herb	1700				
754	*Gonostegia hirta* (Bl.) Miq.	Mas lahare	Herb	1300-2000				
755	*Laportea terminalis* Wight.	Sisnu	Herb	2500				
756	*Lecanthus peduncularis* (Royle) Wedd.	Khole jhar	Herb	1900				
757	*Maoutia puya* (Hook. f.) Wedd.		Shrub	1600				
758	*Pilea peploides* Hook. & Arn.		Herb	1400				
759	*Pilea scripta* (Buch.-Ham.) Wedd.		Herb	2100				
760	*Pilea symmeria* Wedd.		Herb	2300				
761	*Pilea umbrosa* Wedd.		Herb	2500				
762	*Pouzolzia zeylanica* (L.) J. Bennet & Brown		Herb or shrub	1400				
763	*Urtica dioica* L.		Herb	1300				
Valerianaceae								
764	*Valeriana hardwickii* Wall.	Nakkali jatamansi	Herb	1500-2700				
765	*Valeriana jatamansi* Jones	Sugandhawal	Herb	1500		II	P	
Verbenaceae								
766	*Callicarpa arborea* Roxb. ex C. B. Clarke	Mas gede	Tree	1500				
767	*Callicarpa macrophylla* Vahl.		Shrub	1300-1800				
768	*Caryopteris foetida* (D. Don) Thellung.		Shrub	1300				
769	*Caryopteris odorata* (Buch.-Ham ex D. Don) B. L. Robinson		Shrub	2100				
770	*Clerodendron fragrans* Ventenat		Shrub	1300				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITES	GoN	Endemism
771	*Clerodendron indicum* (L.) O. Kuntze		Shrub	2100				
772	*Clerodendron japonicum* (Thunb.) Sweet		Shrub	1300				
773	*Holmskiodia sanguinea* Retz.	Jhule phul	Shrub	2000				
774	*Lantana camara* L.	Gandhe phul	Shrub	1500				
775	*Lippia nodiflora* (L.) L. C. Richard ex Michaux		Creeping herb	1300				
776	*Verbena officinalis* L.		Herb	1300				
777	*Vitex negundo* L.	Simali	Shrub	1600				
Violaceae								
778	*Viola biflora* L.	Siplikan	Herb	2700				
779	*Viola serpens* Wall.	Ghatte ghans	Herb	1300-2000				
Vitaceae								
780	*Ampelocissus glandulosa* (Wall.) Momoyama		Climber	1300				
781	*Ampelocissus sikkimensis* (Laws.) Planch.		Climber	1400-1800				
782	*Cayratia pedata* Gangnep.		Climber	1400				
783	*Cayratia thomsonii* (Lawson) Sussenguth		Climber	2000				
784	*Leea macrophylla* Roxb. ex Hornem.		Shrub	2200				
785	*Parthenocissus semicortata* (Laws.) Planch.		Climber	1400-1900				
786	*Tetrastigma obtectum* (Wall.) Planch.		Creeping herb	1600-2500				
787	*Tetrastigma serrulatum* (Roxb.) Planch.		Climber	1800-2100				
788	*Vitis lanata* Roxb.		Climbing shrub	2200				
789	*Vitis parviflora* Roxb.		Climbing shrub	1800				

ANNEX 7

Monocot flora of SNNP

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
Agavaceae								
1	*Agave americana* L.	Ketuke	Shrub	1500				
Amaryllidaceae								
2	*Crinum amoenum* Roxb.	Hade lasun	Herb	1300				
3	*Zephyranthes citrina* Baker		Herb	2700				
Araceae								
4	*Acorus calamus* L.	Bojho	Herb	2200				
5	*Amorphophallus bulbifer* (Roxb.) Blume		Herb	1400				
6	*Ariopsis peltata* J. Grah.		Herb	1500				
7	*Arisaema concinnum* Schott		Herb	1600				
8	*Arisaema consanguineum* Schott		Herb	1700				
9	*Arisaema costatum* (Wall.) Martius		Herb	1600				Endemic to Nepal
10	*Arisaema echinatum* (Wall.) Schott		Herb	2600				
11	*Arisaema erubescens* (Wall.) Schott	Sarpa makai	Herb	2200				
12	*Arisaema intermedium* Blume		Herb	2800				
13	*Arisaema nepenthoides* (Wall.) Martius	Sarpa makai	Herb	2200				
14	*Arisaema propinquum* Schott		Herb	2500				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
15	*Arisaema speciosum* (Wall.) Martius		Herb	2700				
16	*Arisaema tortuosum* (Wall.) Schott		Herb	1800				
17	*Arisaema utile* Hook. f. ex Schott	Tinpate	Herb	2700				
18	*Gonatanthus pumilus* (D. Don) Engler & Krause		Herb	1700				
19	*Pothos cathcarti* Schott		Climbing shrub	1700				
20	*Raphidophora glauca* (Wall.) Schott		Climbing shrub	1700				
21	*Remusatia vivipara* (Loddiges) Schott		Herb	1500				
22	*Sauromatum brevipes* (Hook. f.) N. E. Brown		Herb	2700				
23	*Thomsonia nepalensis* Wall.		Herb	1500				
24	*Typhonium diversifilium* Wall. ex Schott		Herb	2400				
Commelinaceae								
25	*Amischophacelus axillaris* (L.) Rolla	Kane	Herb	1500				
26	*Commelina bengalensis* L.	Ban kane	Herb	1500				
27	*Commelina hasskarlii* C. B. Clarke		Herb	1400				
28	*Commelina paludosa* Blume		Herb	1600				
29	*Cyanotis cristata* (L.) D. Don		Herb	1300				
30	*Cyanotis vaga* (Lour.) J. A. & J. H. Schultes		Herb	1500				
31	*Floscopa scandens* Lour.	Simkane ghans	Herb	2100				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
32	*Murdannia blumei* (Hassk.) Brenan		Herb	1400				
33	*Murdannia japonica* (Thunb.) Faden	Nigale gava	Herb	1800				
34	*Murdannia nudiflora* (L.) Brenan		Herb	1800				
35	*Murdannia spirata* (L.) Bruckner		Herb	1500				
Cyperaceae								
36	*Bulbostylis densa* (Wall. ex Roxb.) Hand.-Mazz.		Herb	1500				
37	*Carex baccans* Nees ex Wight		Herb	1300				
38	*Carex brunnea* Thunb.		Herb	1500				
39	*Carex cruciata* Wahlenb.		Herb	1400				
40	*Carex daltonia* Boot		Herb	1400				
41	*Carex filicina* Nees ex Wight		Herb	2400				
42	*Carex foliosa* D. Don		Herb	2200				
43	*Carex inanis* Kunth		Herb	2000				
44	*Carex indica* L.		Herb	2000				
45	*Carex japonica* Thunb.		Herb	1400				
46	*Carex ligulata* Nees ex Wight		Herb	1500				
47	*Carex longipes* D. Don		Herb	1500				
48	*Carex myosurus* Nees ex Wight		Herb	1900				
49	*Carex nubigena* D. Don		Herb	1600				
50	*Carex setigera* D. Don		Herb	2600				
51	*Carex stramentita* Boott ex Bockeler		Herb	1500				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
52	*Carex vesiculosa* Boott		Herb	1800				
53	*Cyperus aristatus* Rottb.		Herb	1300				
54	*Cyperus difformis* L.		Herb	1300				
55	*Cyperus haspan* L.		Herb	1400				
56	*Cyperus iria* L.		Herb	1300				
57	*Cyperus niveus* Retz.		Herb	1500				
58	*Cyperus pilosus* Vahl.		Herb	1600				
59	*Cyperus rotundus* L.	Mothe	Herb	1300				
60	*Cyperus tenuispica* Steudel.		Herb	1400				
61	*Eleocharis congesta* D. Don		Herb	1600				
62	*Eleocharis palustris* (L.) R. Br.		Herb	1300				
63	*Eriophorum comosum* Wall. ex Nees	Rani babio	Herb	1800				
64	*Fimbristylis complanata* (Reitz.) Link		Herb	2400				
65	*Fimbristylis dichotoma* (L.) Vahl		Herb	2500				
66	*Kyllinga brevifolia* Rottb.		Herb	1300				
67	*Kyllinga monocephala* Rottb.		Herb	1500				
68	*Lipocarpha chinensis* (Osbeck) Kern	Bhakunde ghans	Herb	2100				
69	*Mariscus sieberianus* Nees ex C. B. Clarke		Herb	1300				
70	*Pycreus globosus* Reich.		Herb	1300				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
71	*Pycreus sanguinolentus* (Vahl) Nees		Herb	1600				
72	*Scirpus mucronatus L.*		Herb	1300				
Dioscoreaceae								
73	*Dioscorea bulbifera L.*	Ban tarul	Herb	1400				
74	*Dioscorea deltoidea* Wall.	Ban tarul, Bhyakur	Herb	2100		II		
75	*Dioscorea kamoonensis* Kunth	Rani bhyakur	Herb	2100				
76	*Dioscorea melanophyma* Prain & Burkil		Herb	2200				
77	*Dioscorea pentaphylla* L.		Herb	1400				
Eriocaulaceae								
78	*Eriocaulon kathmanduense* Satake		Aquatic herb	1600				Endemic to Nepal
79	*Eriocaulon luzulaefolium* Mart.		Herb	1500				
80	*Eriocaulon nepalense* Prescott ex Bong.	Bhuri ghans	Herb	1500				Endemic to Nepal
Gramineae								
81	*Agropyron semicostatum* Nees & Steud.		Herb	1500				
82	*Agrostis pilosa* Trin.		Herb	2200				
83	*Alopecurus aequalis* Sobol.		Herb	1500				
84	*Apluda mutica* L.		Herb	1800				
85	*Apocopsis paleacea* (Trin.) Hochr.		Herb	1500				
86	*Arthraxon lancifolius* (Trin.) Hochst.		Herb	1400				
87	*Arthraxon quartinianus* (A. Rich.) Nash		Herb	1400				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
88	*Arundinaria falcata* Nees		Herb	1500				
89	*Arundinella bengalensis* (Sreng.) Druce		Herb	1400				
90	*Arundinella nepalensis* Trin.	Phurke khar	Herb	1800				
91	*Arundo donax* L.		Herb	1500				
92	*Bothriochloa assimilis* (Steud.) Ohwi		Herb	1800				
93	*Bothriochloa bladhii* (Retz.) S.T. Blake		Herb	1400				
94	*Bothriochloa ischaemum* (L.) Keng		Herb	1400				
95	*Bothriochloa parviflora* (R. Br.) Ohwi		Herb	1400				
96	*Brachiaria villosa* (Lamk.) A. Camus		Herb	1400				
97	*Cephalostachyum capitatum* Munro	Gopi bans	Herb	1400				
98	*Chrysopogon aciculatus* (Retz.) Trin.		Herb	1300				
99	*Coix lachryma-jobi* L.	Bhrikaulo	Herb	1300				
100	*Cymbopogon pendulus* (Nees ex Steud.) Wats.	Bhrikaulo	Herb	1300				
101	*Cynodon dactylon* (L.) Pers.	Dubo	Herb	2100				
102	*Cyrtococcum accrescens* (Trin.) Stapf		Herb	2100				
103	*Cyrtococcum patens* (L.) A. Camus		Herb	1700				
104	*Dendrocalamus hamiltonii* Nees & Arn. ex Munro	Tama bans	Arborescent bamboo	1700				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
105	*Digitaria adscendens* (HBK) Henr.		Herb	1300				
106	*Digitaria timorensis* (Kunth.) Bal.		Herb	1400				
107	*Digitaria violascens* Link.		Herb	2000				
108	*Dimeria ornithopoda* Trin.		Herb	1400				
109	*Echinochloa crusgalli* (L.) P. Beauv.		Herb	1600				
110	*Eleusine indica* (L.) Gaertn.		Herb	1400				
111	*Eragrostiella bifaria* (Vahl.) Bor		Herb	1900				
112	*Eragrostis atrovirens* (Desf.) Trin. ex Steud.		Herb	1500				
113	*Eragrostis gangetica* (Roxb.) Steud.		Herb	2100				
114	*Eragrostis japonica* (Thunb.) Trin.		Herb	1800				
115	*Eragrostis tenella* (L.) P. Beauv.		Herb	1300				
116	*Eragrostis unioloides* (Retz.) Nees ex Steud.		Herb	1300-1700				
117	*Erianthus longisetosus* Anderss.		Herb	1700				
118	*Eulalia mollis* (Griseb.) O. Kuntze		Herb	2200				
119	*Festuca leptopogon* Stapf		Herb	1700				
120	*Hemarthria compressa* (L. f.) R. Br.		Herb	1400				
121	*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult.	Khar ghans	Herb	1500				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
122	*Imperata cylindrica* (L.) P. Beauv.	Siru	Herb	1300				
123	*Isachne albens* Trin.		Herb	1800				
124	*Isachne globosa* (Thunb.) O. Kuntze		Herb	1500				
125	*Isachne miliacea* Roth.		Herb	1400				
126	*Ischaemum rugosum* Salisb.		Herb	1600				
127	*Lolium perenne* L.		Herb	1700				
128	*Microstegium ciliatum* (Trin.) A. Camus		Herb	1300				
129	*Microstegium nudum* (Trin.) A. Camus		Herb	1500				
130	*Miscanthus nepalensis* (Trin.) Hack.		Herb	2100				
131	*Neyraudia reynaudiana* (Kunth) Keng ex Hitch.		Herb	1500				
132	*Oplisemenus burmanii* (Retz.) P. Beauv.		Herb	1300				
133	*Oplisemenus composites* (L.) P. Beauv.		Herb	1500				
134	*Panicum psilopodium* Trin.		Herb	1400				
135	*Paspalum distichum* L.		Herb	1600				
136	*Paspalum scrobiculatum* L.		Herb	1300				
137	*Phalaris minor* Retz.		Herb	1600				
138	*Phragmites karka* (Karka.) Trin. ex Steud.		Herb	1600				
139	*Pogonantherum crinitum* (Thunb.) Kunth		Herb	1500				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
140	*Pogonantherum paniceum* (Lam.) Hack.		Herb	1500				
141	*Polypogon fugax* Nees ex Steud.		Herb	2300				
142	*Polypogon monspeliensis* (L.) Desf.		Herb	1600				
143	*Pseudechinolaena polystachya* (HBK) Stapf.		Herb	1500				
144	*Saccharum spontaneum* L.	Kans	Herb	1400				
145	*Sacciolepis indica* (L.) A. Chase		Herb	1500				
146	*Setaria forbesiana* (Nees ex Steud.) Hook. f.		Herb	1300				
147	*Setaria geniculata* (Lamk.) P. Beauv.		Herb	1400				
148	*Setaria glauca* (L.) P. Beauv.		Herb	1500				
149	*Setaria pallidefusca* (Schumach.) Stapf & C. E. Hubb		Herb	1300				
150	*Setaria plicata* (Lam.) T. Cooke		Herb	1500				
151	*Sporobolus diander* (Retz.) P. Beauv.		Herb	1300				
152	*Sporobolus fertilis* (Steud.) W. D. Clayton		Herb	1300				
153	*Sporobolus piliferus* (Trin.) Kunth.		Herb	1300				
154	*Thamnocalamus aristatus* (Gamble) E. G. Camus	Ban nigalo	Herb	2500				
155	*Themeda hookeri* (Griesb.) A. Camus		Herb	1800				
156	*Thysanolaena maxima* (Roxb.) O. Kuntze	Amriso	Herb	1800				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
157	*Tripogon filiformis* Nees ex Steud.		Herb	2600				
158	*Tripogon trifidus* Munro ex Stapf		Herb	1300				
Hydrocharitaceae								
159	*Hydrilla verticillata* (L. f.) Royle		Aquatic floating herb	1600				
Hypoxidaceae								
160	*Curculigo orchioides* Gaertn.	Musali	Herb	1300				
161	*Hypoxis aurea* Lour.	Karsul, Ban siru	Herb	1400				
Juncaceae								
162	*Juncus cocinnus* D. Don		Herb	2700				
163	*Juncus prismatocaarpus* R. Br.		Herb	1300				
Lemnaceae								
164	*Lemma perpusilla* Torrey		Herb	1400				
Liliaceae								
165	*Allium wallichii* Kunth	Ban lasun	Herb	2700				
166	*Asparagus filicinus* Buch.-Ham. ex D. Don	Kurilo	Climbing shrub	1800				
167	*Asparagus racemosus* Willd.	Kurilo, Satawari	Climbing shrub	1800				
168	*Campylandra aurantiaca* (Wall.) Baker		Herb	2000				
169	*Cardiocrinum giganteum* (Wall.) Makino		Herb	2000				
170	*Chlorophytum arundinaceum* Baker		Herb	1800				
171	*Chlorophytum nepalense* (Lind.) Baker		Herb	1300				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
172	*Disporum cantoniense* (Lour.) Merrill	Sano kukur daino	Herb	1800				
173	*Lilium nepalense* D. Don	Khiraule	Herb	2400				
174	*Ophiopogon intermedium* D. Don	Ban kasur	Herb	1300				
175	*Ophiopogon wallichianus* (Kunth.) Hook. f.		Herb	2700				
176	*Paris polyphylla* Smith in Rees	Satuwa	Herb	2200				
177	*Polygonatum cirrhifolium* (Wall.) Royle		Herb	2700				
178	*Polygonatum oppositifolium* (Wall.) Royle		Herb	1700				
179	*Polygonatum punctatum* Royle ex Kunth		Herb	2100				
180	*Polygonatum verticillatum* (L.) Allioni		Herb	2100				
Orchidaceae								
182	*Aerides longicornu* Hook. f.		Epiphytic herb	1500		II		
183	*Agrostophyllum callosum* Reichb. f.		Epiphytic herb	2100		II		
184	*Anoectochilus lanceolatus* Lind.		Epiphytic herb	2000		II		
185	*Anthogonium gracile* Lindl.		Herb	1800		II		
186	*Arundina graminifolia* (D. Don) Hochr.	Gava	Herb	2100		II		
187	*Bulbophyllum affine* Lindl.		Epiphytic herb	1800		II		
188	*Bulbophyllum cylindraceum* Lindl.		Epiphytic herb	2300		II		
189	*Bulbophyllum hirtum* Lindl.		Epiphytic herb	1800		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
190	*Bulbophyllum polyrhizum* Lindl.		Epiphytic herb	2100		II		
191	*Bulbophyllum reptans* Lindl.		Epiphytic herb	2500		II		
192	*Bulbophyllum secundum* Hook. f.		Epiphytic herb	2100		II		
193	*Bulbophyllum wallichii* (Lindl.) Reichb. f.		Epiphytic herb	2400		II		
194	*Calanthe brevicornu* Lindl.		Herb	2100		II		
195	*Calanthe mannii* Hook. f.		Herb	1800		II		
196	*Calanthe masuca* (D. Don) Lindl.		Herb	1800		II		
197	*Calanthe puberula* Lindl.		Herb	2100		II		
198	*Calanthe tricarinata* Lindl.		Herb	2300		II		
199	*Cephalanthera esnifolia* Rich.		Herb	2600		II		
200	*Chiloschista asneoides* (Don) Lindl.		Epiphytic herb	1700		II		
201	*Chiloschista lunifera* (Reichb. f) J. J. Smith		Epiphytic herb	1700		II		
202	*Chiloschista lunifera* (Reichb. f) J. J. Smith		Epiphytic herb	1700		II		
203	*Cirrhopetalum elatum* Hook. f.		Epiphytic herb	2100		II		
204	*Cirrhopetalum guttulatum* Hook. f.		Epiphytic herb	1500		II		
205	*Cirrhopetalum hookeri* Duthie		Epiphytic herb	2500		II		
206	*Cirrhopetalum maculosum* Lindl.		Epiphytic herb	1800		II		
207	*Cirrhopetalum refractum* Zolling		Epiphytic herb	1800		II		
208	*Coelogyne corymbosa* Lindl.		Epiphytic herb	2500		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
209	*Coelogyne cristata* Lindl.		Epiphytic herb	1800		II		
210	*Coelogyne flaccida* Lindl.		Epiphytic herb	1800		II		
211	*Coelogyne flavida* Wall. ex Hook. f.		Epiphytic herb	2100		II		
212	*Coelogyne fuscescens* Lindl.		Epiphytic herb	1800		II		
213	*Coelogyne ovalis* Lindl.		Epiphytic herb	1800		II		
214	*Coelogyne uniflora* Lindl.		Epiphytic herb	2300		II		
215	*Cryptochilus lutea* Lindl.		Epiphytic herb	2300		II		
216	*Cryptochilus sanguineus* Wall.		Epiphytic herb	2100		II		
217	*Cymbidium cyperifolium* Wall. ex Hook. f.		Epiphytic herb	1700		II		
218	*Cymbidium elegans* Lindl.		Epiphytic herb	2400		II		
219	*Cymbidium giganteum* Wall. & Lindl.		Epiphytic herb	1500		II		
220	*Cymbidium lancifolium* Hook.		Epiphytic herb	1800		II		
221	*Cymbidium longifolium* D. Don		Epiphytic herb	2400		II		
222	*Dendrobium amoenum* Wall. ex Lindl.		Epiphytic herb	1700		II		
223	*Dendrobium bicameratum* Lindl.		Epiphytic herb	2100		II		
224	*Dendrobium candidum* Wall. ex Lindl.		Epiphytic herb	2100		II		
225	*Dendrobium clavatum* Wall. ex Lindl.		Epiphytic herb	1600		II		
226	*Dendrobium densiflorum* Lindl. ex Wall.	Sun gava	Epiphytic herb	1800		II		
227	*Dendrobium denudans* D. Don		Epiphytic herb	1800		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
228	*Dendrobium heterocarpum* Wall. ex Lindl.		Epiphytic herb	2100		II		
229	*Dendrobium longicornu* Lindl.		Epiphytic herb	2500		II		
230	*Dendrobium pierardi* Roxb.		Epiphytic herb	1600		II		
231	*Dendrobium porphyrochilum* Lindl.		Epiphytic herb	2300		II		
232	*Diplomeris hirsuta* Lindl.		Herb	2100		II		
233	*Epigeneium amplum* (Lindl.) Summerh.		Epiphytic herb	2000		II		
234	*Epigeneium rotundatum* (Benth.) Summerh.		Epiphytic herb	1800		II		
235	*Eria bractescens* Lindl.		Epiphytic herb	1800		II		
236	*Eria confusa* Hook. f.		Epiphytic herb	1800		II		
237	*Eria convallarioides* Lindl.		Epiphytic herb	2400		II		
238	*Eria coronaria* (Lindl.) Reichb. f.		Epiphytic herb	2000		II		
239	*Eria excavata* Lindl. ex Hook. f.		Epiphytic herb	1800		II		
240	*Eria graminifolia* Lindl.		Epiphytic herb	1800		II		
241	*Eria paniculata* Lindl. ex Wall.		Epiphytic herb	1300		II		
242	*Esmeralda clarkei* Reichb.		Epiphytic herb	2000		II		
243	*Gastrochilus calceolaris* (Sm.) D. Don		Epiphytic herb	1800		II		
244	*Gastrochilus distichus* (Lindl.) O. Kuntze		Epiphytic herb	2500		II		
245	*Goodyera foliosa* (Lindl.) Benth. ex Hook. f.		Herb	2200		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
246	*Goodyera hemsleyana* King & Pantl.		Herb	2200		II		
247	*Goodyera repens* (Lindl.) R. Brown		Herb	2200		II		
248	*Goodyera secundiflora* Lindl.		Herb	2200		II		
249	*Habenaria arietina* Hook. f.		Herb	2400		II		
250	*Habenaria aristata* Hook. f.		Herb	2300		II		
251	*Habenaria bicornuta* Hook. f.		Herb	2000		II		
252	*Habenaria densa* Wall. ex Lindl.		Herb	2700		II		
253	*Habenaria dentata* (Sw.) Schlecht.		Herb	1600		II		
254	*Habenaria galeandra* (Reichb. f.) Benth.		Herb	2000		II		
255	*Habenaria latilabris* (Lindl.) Hook. f.		Herb	2100		II		
256	*Habenaria pectinata* D. Don		Herb	2100		II		
257	*Habenaria stenantha* Hook. f.		Herb	2700		II		
258	*Habenaria stenopetala* Lindl.		Herb	2100		II		
259	*Habenaria triflora* D. Don		Herb	1700		II		
260	*Herminium angustifolium* (Lindl.) Benth. ex Hook.		Herb	2600		II		
261	*Herminium monophyllum* (D.Don) Hunt et Summerhayes		Herb	2000		II		
262	*Herminium quinquelobum* King & Pantl.		Herb	2300		II		
263	*Ione bicolor* Lindl.		Ephiphytic herb	1800		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
264	*Ione paleacea* Lindl.		Ephiphytic herb	1800		II		
265	*Liparis cordifolia* Hook. f.		Ephiphytic herb	1700		II		
266	*Liparis perpusilla* Hook. f.		Ephiphytic herb	2400		II		
267	*Liparis resupinata* Ridely		Ephiphytic herb	2600		II		
268	*Liparis viridiflora* (Blume) Lindl.		Ephiphytic herb	2100		II		
269	*Luisia teretifolia* Gaud.		Ephiphytic herb	1700		II		
270	*Malaxis acuminate* D. Don		Herb	1700		II		
271	*Malaxis cylindrostachya* (Lindl.) Kuntze		Herb	2300		II		
272	*Malaxis josephiana* (Reichb. f.) O. Kuntze		Herb	1300		II		
273	*Malaxis khasiana* (Hook. f.) O. Kuntze		Herb	1500		II		
274	*Malaxis muscifera* (Lindl.) O. Kuntze		Herb	2500		II		
275	*Monomeria barbata* Lindl.		Epiphytic herb	1800		II		
276	*Nervillia scottii* (Reichb. f.) Schltr.		Epiphytic herb	1400		II		
277	*Oberonia ensiformis* (Sm.) Lindl.		Epiphytic herb	1400		II		
278	*Oberonia iridifolia* (Roxb.) Lindl.		Epiphytic herb	1300		II		
279	*Oberonia myosurus* Lindl.		Epiphytic herb	1700		II		
280	*Oberonia rufilabris* Lindl.		Epiphytic herb	1700		II		
281	*Oreorchis foliosa* (Lindl.) Lindl.		Herb	2400		II		
282	*Otochilus alba* Lindl.		Epiphytic herb	2100		II		
283	*Otochilus fusca* Lindl.		Epiphytic herb	1800		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
284	*Otochilus porrecta* Lindl.		Epiphytic herb	2400		II		
285	*Panisea parviflora* Lindl.		Epiphytic herb	2100		II		
286	*Peristylus constrictus* Lindl.		Herb	1600		II		
287	*Peristylus falax* Lindl.		Herb	1700		II		
288	*Peristylus goodyeroides* (D. Don) Lindl.		Herb	1400		II		
289	*Phalaenopsis taenialis* (Lindl.) Christenson & Pradhan		Epiphytic herb	2100		II		
290	*Pholidota articulata* Lindl.		Epiphytic herb	2100		II		
291	*Pholidota griffithii* Hook. f.		Epiphytic herb	2100		II		
292	*Pholidota imbricata* (Roxb.) Lindl.		Epiphytic herb	1700		II		
293	*Pholidota protracta* Hook. f.		Epiphytic herb	2100		II		
294	*Platanthera bakeriana* (King & Pantl.) Kraenzl.		Herb	2100		II		
295	*Pleione hookeriana* (Lindl.) O. Kuntze		Epiphytic herb	2600		II		
296	*Pleione humilis* (Sm.) D. Don		Epiphytic herb	2600		II		
297	*Pleione praecox* (Sm.) D. Don		Epiphytic herb	2000		II		
298	*Rhynchostylis retusa* Blume		Epiphytic herb	2000		II		
299	*Satyrium nepalense* D. Don		Herb	2100		II		
300	*Spiranthes sinensis* (Pers.) Ames		Herb	2100		II		
301	*Sunipia scariosa* Lindl.		Epiphytic herb	1400		II		
302	*Thunia alba* (Lindl.) Reichb. f.		Epiphytic herb	2100		II		

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
303	*Vanda alpina* Lindl.		Epiphytic herb	1400		II		
304	*Vanda cristata* Lindl.		Epiphytic herb	1700		II		
305	*Vandopsis undulata* (Lindl.) J. J. Smith		Epiphytic herb	2100		II		
Pontederiaceae								
306	*Monochoria vaginalis* (Burm. f.) Presl		Aquatic herb	1400				
Potamogetonaceae								
307	*Potamogeton crispus* L.		Aquatic submerged herb	1600				
308	*Potamogeton polygonifolius* Pourr		Aquatic, floating or submerged herb	1400				
Smilacaceae								
309	*Smilax aspera* L.	Kukur daino	Climbing shrub	1500				
310	*Smilax ferox* Wall. ex Kunth		Climbing shrub	2000				
311	*Smilax glaucophylla* Klozsch in Reise		Climbing shrub	1900				
312	*Smilax lancaefolia* Roxb.	Chhatiwan	Climbing shrub	1500				
313	*Smilax menispermoidea* A. DC.	Kukur daino	Climbing shrub	1500				
314	*Smilax osmastonii* Wang and Tang		Climbing shrub	2000				
315	*Smilax perfoliata* Loureiro		Climbing shrub	1500				
316	*Smilax rigida* Wall. ex Kunth		Shrub	2500				
Zingiberaceae								
317	*Cautleya gracilis* (Smith) Dandy	Sano saro, Pani saro	Herb	2100				
318	*Cautleya spicata* (Smith) Baker	Sano saro,	Herb	2100				

SN	Scientific name	Local name	Habit	Altitude (m)	IUCN	CITES	GoN	Endemism
319	*Curcuma angustifolia* Roxb.	Bakhre saro	Herb	1300				
320	*Globba clarkei* Baker	Devi saro	Herb	1400				
321	*Globba racemosa* Sm.	Lahare pria ghans	Herb	2000				
322	*Hedychium ellipticum* Hamilt. ex Rees	Rato saro	Herb	1900				
323	*Hedychium spicatum* Buch.-Ham. ex Rees	Pankha phul	Herb	1900				
324	*Roscoea alpina* Royle		Herb	2600				
325	*Roscoea purpurea* J. E. Smith	Rasgari	Herb	2200				

ANNEX 8

Gymnosperm flora of Shivapuri Nagarjun National Park

SN	Scientific name	Habit	Altitude	Local name	IUCN	CITES	GoN	Endemism
Pinaceae								
1	*Abies spectabilis* (D. Don) Mirb.	Tree	2800	Gobre Salla				
2	*Cedrus deodara* (Roxb. ex D. Don) G. Don	Tree	1500	Devdaru				
3	*Pinus roxburghii* Sargent	Tree	1500-2100	Khote Salla				
4	*Pinus wallichiana* A. B. Jacks	Tree	2000	Khote Salla				
Podocarpaceae								
5	*Podocarpus neriifolius* D. Don	Tree	1700	Gunsi		III		
Taxaceae								
6	*Taxus wallichiana* Zucc.	Tree	2100-2800	Lauth Salla, Barme Salla	EN	II	P	

ANNEX 9

Pteridophytic flora of Shivapuri Nagarjun National Park

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
Aspleniaceae								
1	*Asplenium bullatum* Wall. ex Mett.		Terrestrial	1800				
2	*Asplenium ensiforme* Wall. ex Hook. & Grev.		Terrestrial & epiphytic	2100-2700				
3	*Asplenium indicum* Sledge		Terrestrial & epiphytic	2100-2700				
4	*Asplenium laciniatum* D. Don		Mostly epiphytic	1500-2100				
5	*Asplenium tenuifolium* D. Don.		Terrestrial	2500				
6	*Asplenium unilateral* Lam.		Terrestrial	2600				
7	*Asplenium varians* Wall. ex Hook. & Grev.		Terrestrial	1500				
Athyriaceae								
8	*Athyrium drepanopterum* (Kunze) A. Brown ex Milde		Terrestrial	1500				
9	*Athyrium foliolosum* (Wall.) Moore		Terrestrial	2500				
10	*Athyrium macrocarpon* (Bl.) Bedd.		Terrestrial	2000				
11	*Athyrium nigripes* (Bl.) Moore		Terrestrial	1500				
12	*Athyrium pectinatum* (Wall. ex Mett.) Bedd.		Terrestrial	1800				
13	*Athyrium schimperi* (A. Br.) Moug. ex Free		Terrestrial	1550				
14	*Athyrium setiferum* C. Chr.		Terrestrial	2300				
15	*Athyrium thalypteroides* (Michx.)		Terrestrial	2150				
16	*Diplazium esculentum* (Retz.) Presl.		Terrestrial	2000				
17	*Diplazium japonicum* (Thunb.) Bedd.		Terrestrial	2000				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
18	*Diplazium lanceum* (Thunb.) Presl.		Terrestrial	1400				
19	*Diplazium polypodioides* Bl.		Terrestrial	1450				
20	*Diplazium spectabile* (Wall. ex Mett.) Ching		Terrestrial	2000				
21	*Diplazium stoliczkae* Bedd.		Terrestrial	2700				
22	*Dryoathyrium boryanum* (Willd.) Ching	Kalo neuro	Terrestrial	1500-2400				
Blechnaceae								
23	*Woodwardia unigemmata* (Makino) Nakai	Danthe unyu	Terrestrial	1350				
Cyatheaceae								
24	*Cyathea spinulosa* Wall. ex Hook.		Terrestrial	2000		II		
Davalliaceae								
25	*Davallodes membranulosum* (Wall. ex Hook.) Copel		Terrestrial	1900				
26	*Araiostegia delavayi* (Bedd. ex. Clarke & Bak.) Ching		Terrestrial	1800				
27	*Araiostegia pseudo-cystopteris* (Kunze) Copel		Terrestrial	1800				
28	*Araiostegia pulchra* (D. Don) Copel		Terrestrial	2100				
Dennstaedtiaceae								
29	*Dennstaedtia appendiculata* (Wall.) J. Smith		Terrestrial	1600				
30	*Dennstaedtia scabra* (Wall.) Moore		Terrestrial	1600				
31	*Lindsaea odorata* Roxb.		Terrestrial	1800				
32	*Sphenomeris chinensis* (L.) Maxon		Terrestrial	1550				
Dryopteridaceae								
33	*Arachniodes spectabilis* (Ching) Ching		Terrestrial	1300				
34	*Dryopteris apiciflora* (Wall.) O. Kuntze		Terrestrial	2600				
35	*Dryopteris atrata* (Wall. ex Kuntze) Ching		Terrestrial	2600				
36	*Dryopteris chrysocoma* (Christ) C. Chr.		Terrestrial	1700				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
37	*Dryopteris cochleata* (D. Don) C. Chr.		Terrestrial	1600				
38	*Dryopteris khasiana* Chr.		Terrestrial	1400				
39	*Dryopteris marginata* (Wall. ex Christ) Christ		Terrestrial	2700				
40	*Dryopteris sparsa* (D. Don) O. Kuntze		Terrestrial	1600 -1800				
41	*Leucostegia immerse* (Wall.) Presl	Chamsure unyu	Terrestrial	1800				
42	*Olendra neriiformis* Cav.		Terrestrial	1400-1800				
43	*Peranema cyatheoides* D. Don		Terrestrial	2600				
44	*Polystichum lantum* D. Don		Terrestrial	1600				
45	*Polystichum neobatum* Nakai		Terrestrial	2700				
46	*Polystichum obliquum* (D. Don) Moore		Terrestrial	2500				
47	*Polystichum setiferum* (Forsk.) Moore		Terrestrial	2500				
48	*Polystichum squarrosum* (D. Don) Fee		Terrestrial	1300-1800				
49	*Polystichum thomsonii* (Hook. f.) Bedd.		Terrestrial	2500				
Equisetaceae								
50	*E. diffusum* D. Don	Kukure jhar, Ankhe jhar	Herb	2000				
51	*Equisetum debile* Roxb.	Thalche jhar, Ankhe jhar	Herb	2000				
Gleicheniaceae								
52	*Dicranopteris linearis* (Burm.) Undrew.		Creeping herb	1800				
53	*Gleichenia glauca* (Thunb.) Hook.		Very large fern	2700				
Hymenophyllaceae								
54	*Crepidomanes latealatum* (V. D. Bosch) Copel		Herb	1400				
55	*Mecodium badium* (Hook. & Grev.) Copel		Herb	2600				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
56	*Mecodium polyanthus* (Sw.) Copel		Herb	2500				
57	*Vandenboschia radicas* (Sw.) Copel		Herb	2400				
Lycopodiaceae								
58	*Lycopodium cernuum* L.	Naagbeli	Creeping herb	1500				
59	*Lycopodium clavatum* L.	Naagbeli	Creeping herb	2500				
60	*Lycopodium hamiltonii* Spreng.		Epiphytic herb	2100				
61	*Lycopodium serratum* Thunb.		Terrestrial herb	2100				
62	*Lycopodium subulifolium* Wall. ex Hook. & Grev.		Epiphytic herb	1950				
Nephrolepidaceae								
63	*Nephrolepis cordifolia* (L.) Presl		Terrestrial	1800				
Ophioglossaceae								
64	*Botrychium lanuguinosum* Wall. ex Hook. & Grev		Terrestrial herb	1500				
65	*Botrychium multifidum* (Gmel.) Rupr.		Terrestrial herb	1800				
66	*Ophioglossum petiolatum* Hook.	Jibre saag	Terrestrial herb	2000				
67	*Ophioglossum reticulatum L.*	Jibre saag	Terrestrial herb	2000				
Polypodiaceae								
68	*Arthromeris himalayensis* (Hook.) Ching		Terrestrial & epiphytic	2200				
69	*Arthromeris wallichiana* (Spr.) Ching		Terrestrial & epiphytic	1400-1450				
70	*Colysis hemionitidea* Presl.		Terrestrial	1400				
71	*Colysis latiloba* (Ching) Ching		Terrestrial	1300-1500				
72	*Crypsinus ebinepis* (Hook.) Copel.		Terrestrial & epiphytic	2200-2700				
73	*Crypsinus hastatus* Thunb.		Terrestrial & epiphytic	2100-2500				
74	*Crypsinus malacodon* Copel.		Epiphytic	1700				
75	*Ctenopteris subfalcata* (Bl.) Kuntze		Epiphytic & terrestrial	2200-2600				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
76	*Drynaria mollis* Bedd.		Mostly epiphytic	2100				
77	*Drynaria propinqua* (Wall. ex Mett.) J. Smith		Epiphytic & terrestrial	1500				
78	*Lepisorus kashypii* (Mehra) Mehra		Epiphytic & terrestrial	2000				
79	*Lepisorus loriformis* (Wall. ex Mett) Ching		Epiphytic & terrestrial	1600				
80	*Lepisorus nudus* (Hook.) Ching		Epiphytic & terrestrial	1550				
81	*Loxogramme involuta* (D. Don) Presl.		Epiphytic & terrestrial	1550				
82	*Microlepia speluncea* (L.) Moore		Terrestrial	1600				
83	*Microlepia strigosa* (Thunb.) Presl		Terrestrial	1600				
84	*Microsorum cuspidatum* (D. Don) Tagawa		Epiphytic & terrestrial	1800				
85	*Microsorum normale* (D. Don) Ching		Epiphytic & terrestrial	2000				
86	*Polypodium amoenum* Wall. ex Mett.		Epiphytic & terrestrial	1800				
87	*Polypodium argutum* Wall. ex Hook.		Epiphytic & terrestrial	2130				
88	*Polypodium lachnopus* Wall. ex Hook.		Epiphytic & terrestrial	1500				
89	*Pyrrosia beddomeana* (Gies.) Ching		Epiphytic & terrestrial	1400				
90	*Pyrrosia flocculosa* (D. Don) Ching		Epiphytic	1550				
91	*Pyrrosia mannii* (Gies.) Ching		Epiphytic	1500				
92	*Pyrrosia mollis* (Kuntze) Ching		Epiphytic & terrestrial	1500				
Pteridaceae								
93	*Adiantum capillus-veneris* L.	Pakhale unyu	Terrestrial herb	1500				
94	*Adiantum caudatum* L.		Terrestrial herb	1500				
95	*Adiantum edgeworthii* Hook.		Terrestrial herb	1500				
96	*Adiantum philippense* L.	Kani unyu	Terrestrial herb	2000				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
97	*Antrophyum reticulatum* (Forst.) Kaulf.		Epiphytic	1400				
98	*Cheilianthes albomarginata* C.B. Clarke	Rani syuka	Terrestrial herb	1500				
99	*Cheilianthes anceps* Blanf.	Rani unyu	Terrestrial herb	1500				
100	*Cheilianthes farinosa* (Forssk.) Kaulf.		Terrestrial herb	1800				
101	*Cheilianthes rufa D. Don*	Sunauli unyu	Terrestrial herb	1800				
102	*Cheilianthes tenuifolium (*Burm.) Sw.		Terrestrial herb	1800				
103	*Coniogramme caudate* (Wall ex. Ettingsch) Ching		Terrestrial herb	2500				
104	*Coniogramme intermedia* Hieron.		Terrestrial herb	1700				
105	*Onychium contiguum* C. Hope		Terrestrial	1600				
106	*Onychium japonicum* (Thunb.) Kunze		Terrestrial	1800				
107	*Onychium lucidum* (D. Don) Spreng.		Terrestrial	1100				
108	*Onychium siliculoslum* (Desv.) C. Chr.		Terrestrial	1800				
109	*Pteridium aquilinum* (L.) Kuhn		Terrestrial	1800				
110	*Pteris aspericaulis* Wall ex. Agardh		Terrestrial	1500				
111	*Pteris biureta L.*		Terrestrial	1400				
112	*Pteris cretica L.*		Terrestrial	1550				
113	*Pteris geminata* Wall.		Terrestrial	1400				
114	*Pteris pellucida* Presl.		Terrestrial	2600				
115	*Pteris quadriaurita* Retz.		Terrestrial	2600				
116	*Pteris wallichiana* Agardh		Terrestrial	2600				
Schizaeaceae								
117	*Lygodium japonicum* (Thunb.) Sw.		Climbing herb	1300				
Selaginellaceae								
118	*Selaginella biformis* A. Br. ex Kuhn		Creeping herb					
119	*Selaginella chrysocaulos* Hook. & Grev.			1500				
120	*Selaginella monospora* Spring			2400				

SN	Scientific name	Nepali name	Habit	Elevation	IUCN	CITE	GoN	Endemism
121	*Selaginella subdiaphana* (Wall.) Spring			2100				
Tectariaceae								
122	*Tectaria macrodonta* (Fee) C. Chr.		Terrestrial	1800				
123	*Tectaria polymorpha* (Wall.) Copel.		Terrestrial	1550				
Thelypteridaceae								
124	*Thelypteris auriculata* (J. Smith) K. Iwats.		Terrestrial	2700				
125	*Thelypteris dentata* (Forsk.) St. John.		Terrestrial	1500				
126	*Thelypteris erubescens* (Wall. ex Hook) Ching		Terrestrial	1700				
127	*Thelypteris esquirolli* (Christ) Ching		Terrestrial	1700				
128	*Thelypteris molliuscula* (Kuhn) K. Iwats.		Terrestrial	1300-1550				
129	*Thelypteris xylodes* (Kuntze) Ching		Terrestrial	1500				
Vittariaceae								
130	*Vittaria elongata* Sw.		Epiphytic	1800				
131	*Vittaria flexuosa* Fee		Epiphytic	1800				

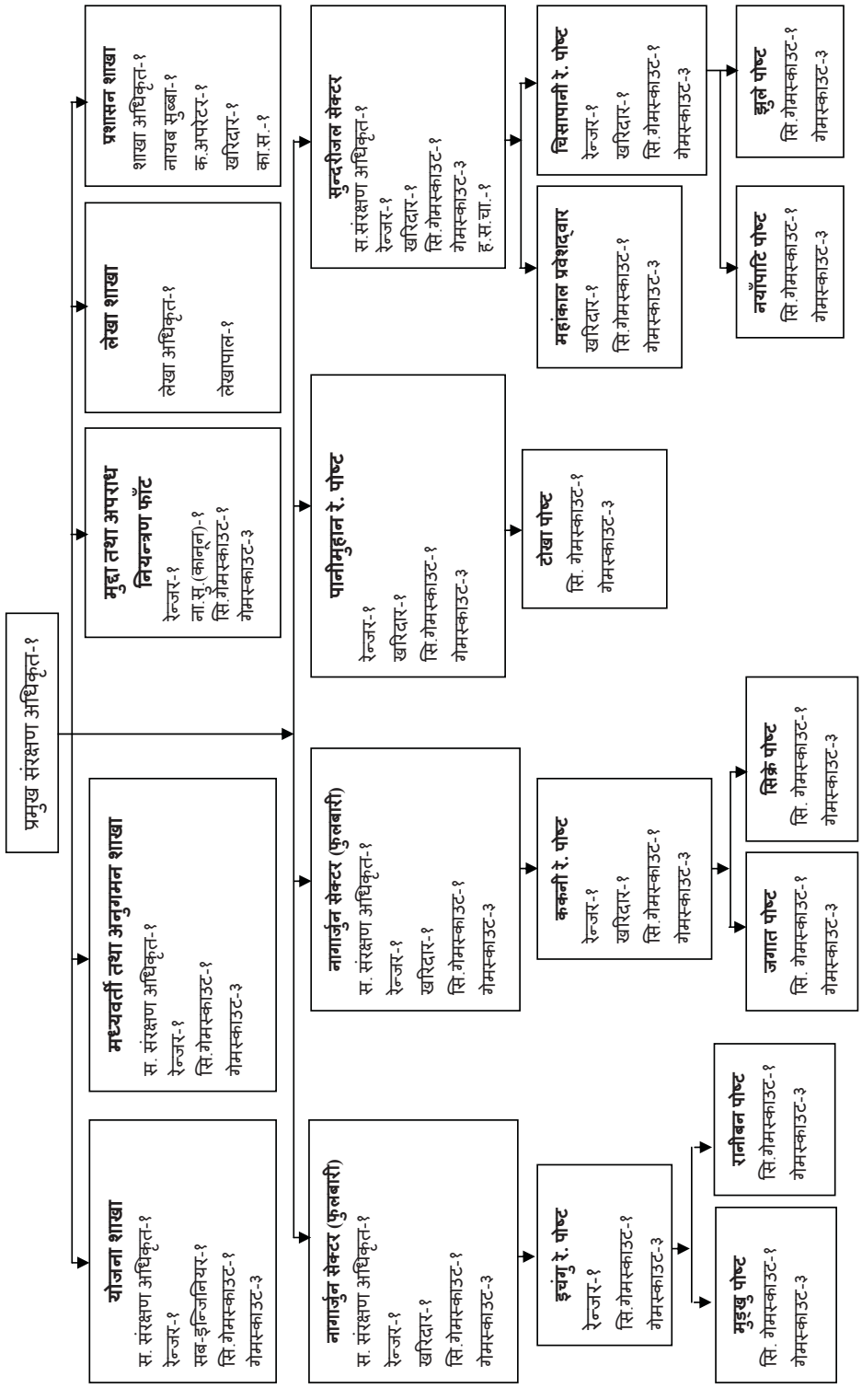
ANNEX 10

Macrofungi species of Shivapuri Nagarjun National Park

SN	Species	Common name
Agaricaceae		
1	*Agaricus haemorrhoidarius* Schulzer	
2	*Bovista pila* Berk. & M. A. Curtis	Thumbling Puffball
3	*Lepiota ochraceofulva* P. D. Orton	
4	*Microlepiota rhacodes* (Vittad.) Singer	Shaggy Parasol
Amanitaceae		
5	*Amanita phalloides* (Vaill. ex Fr.) Link	
6	*Amanita smithiana* Bas	
7	*Amanita vaginata* (Bull.) Sutara	
Boletaceae		
8	*Boletus chrysenteron* (Bull.) Sutara	Red Cracking Bolete
9	*Xerocomus badius*	
Cantharellaceae		
10	*Cantharellus cibarius* Fr.	Golden Chanterelle
Hygrophoraceae		
11	*Chrysomphalina chrysophylla* (Fr.) Clemencon	Golden-gilled Gerronema
Hymenochaetaceae		
12	*Coltricia cinnamonea* (Pers.) Murrill	Fairy Stool
Lyophyllaceae		
13	*Calocybe chrysenteron* (Bull.) Singer	Yellow Domecap
Meruliaceae		
14	*Omphalotus olearius* (DC.) Sing	Jack-o-Lantern
Rhizopogonaceae		
15	*Abortiporus biennis* (Schwein.) Murrill	
Russulaceae		
16	*Rhizopogon luteolus* Fr. & Nordholm	False Truffles
17	*Russula delica* Fr.	Milk-white Brittlegill
18	*Russula emetica* (Schaeff.) Pers.	Vomiting Russula
19	*Russula fragilis* (Pers.) Fr.	Fragile Brittlegill
20	*Russula sororia* Fr.	
Stereaceae		
21	*Stereum hirsutum* (Willd.) Pers.	
Thelephoraceae		
22	*Thelephora fuscella* (Cesati) Lloyd	

ANNEX 11

Organisational Structure of SNNP



ANNEX 12

Names of Buffer zone User Committees and Number of User Groups under each Committee:

S. No	Name of BZUC/ VDC	Number of BZUGs	Number of HHs	Population (with Female and Male) covered by UGs			Remarks
				Female	Male	Total	
1.0	**Sundarijal-Shivapuri User Committee**						**(Number of UG- 42)**
1.1	Nayapati	15	544	751	822	1573	Ward 1, 3, 9 of Nayapati Rural Municipality and Ward 4 and 6 of Gokarneshwar Municipality
1.2	Baluwa	10	313	716	721	1437	Ward 1, 5 and 7 of Baluwa Rural Municipality and Ward 7 and 8 of Gokarneshwar Municipality
1.3	Sundarijal	17	605	932	927	1859	Ward 1 to 7 of Sundarijal Rural Municipality and Ward 1, 2 and 3 of Gokarneshwar Municipality
	Total	**42**	**1462**	**2399**	**2470**	**4869**	
2.0	**Chisapani-Shivapuri User Committee**						**(Number of UG- 20)**
2.1	Likhu	4	222	564	535	1099	Ward 7, 8 and 9 of Likhu Rural Municipality
2.2	Chhap	10	422	1053	1177	2230	Ward 1-9 of Chhap Rural Municipality
2.3	Talakhu	6	521	1156	1195	2351	Ward 1-4 and 7 of Talakhu Rural Municipality
	Total	**20**	**1165**	**2773**	**2907**	**5680**	
3.0	**Ichangu Narayan User Committee**						**(Number of UG- 33)**
3.1	Ichangu Narayan	**33**	**1128**	**2350**	**2387**	**4737**	Ward 1- 9 of Ichangu Narayan Rural Municipality and Ward 1-3 of Nagarjun Municipality
4.0	**Kakani-Okharpauwa User Committee**						**(Number of UG- 27)**
4.1	Okharpauwa	18	697	1624	1687	3311	Ward 1 to 3, 7 and 9 of Okharpauwa Rural Municipality

S. No	Name of BZUC/ VDC	Number of BZUGs	Number of HHs	Population (with Female and Male) covered by UGs			Remarks
				Female	Male	Total	
4.2	Kakani	9	355	844	877	1721	Ward 6, 7 and 9 of Kakani Rural Municipality
	Total	**27**	**1052**	**2468**	**2564**	**5032**	
5.0	**Bishnu-Chapali User Committee**					**(Number of UG- 17)**	
5.1	Chapali Bhagrakali	**7**	**461**	**1324**	**1228**	**2552**	Ward 3 to 7 of Bishnu-Chapali Rural Municipality and Ward 1 and 2 of Budhanilkantha Municipality
6.0	**Gurje Bhanjyang User Committee**					**(Number of UG- 25)**	
6.1	Samundradevi	8	346	856	854	1710	Ward 1 to 3 and 9 of Samundradevi Rural Municipality
6.2	Sikre	5	248	643	602	1245	Ward 1-4 of Sikre Rural Municipality
6.3	Sunkhani	7	310	790	886	1676	Ward 1, 2, 4 and 7 of Sunkhani Municipality
6.4	Thanapati	5	231	514	581	1095	Ward 1 and 2 of Thanapati Municipality
	Total	**25**	**1135**	**2803**	**2923**	**5726**	
7.0	**Ramkot, Bhimdhunga, Chhatra Deurali User Committee**					**(Number of UG- 16)**	
7.1	Chhatra Deurali	8	292	634	688	1322	Ward 6 and 7 of CDeurali Rural Municipality
7.2	Ramkot	4	156	286	315	601	Ward 8 and 9 of Ramkot Rural Municipality and Ward 8 of Nagarjun Municipality
7.3	Bhimdhunga	4	332	659	748	1407	Ward 2, 7, 8 and 9 of Bhimdhunga Rural Municipality and Ward 7, 10 and 11 of Nagarjun Municipality
	Total	**16**	**780**	**1579**	**1751**	**3330**	
8.0	**Manichud-Kageshwari User Committee**					**(Number of UG- 36)**	
8.1	Bajrayogini	9	326	720	766	1486	Ward 8 of Bajrayogini Rural Municipality and 12 & 13 Wards of Shankharapur Municipality

S. No	Name of BZUC/ VDC	Number of BZUGs	Number of HHs	Population (with Female and Male) covered by UGs			Remarks
				Female	Male	Total	
8.2	Gagalphedi		874	1849	1875	3724	Ward 2 of Gagalphedi Rural Minicipality anad Ward 1 of Kageshwari-Manahara Municipality
8.3	Lapsiphedi		323	811	774	1585	Ward 2 & 3 of Lapsiphedi Rural Municipality and Ward 3 & 4 of Shankharapur Municipality
	Total	**36**	**1523**	**3380**	**3415**	**6795**	
9.0	**Goldhunga-Jeetpur User Committee**						**(Number of UG- 40)**
9.1	Goldhunga	29	966	2215	2306	4521	Ward 2, 4, 4Kha, 5Ka, 5Kha, 6 and 9 of Goldhunga Rural Municipality & Ward 6 to 8 of Kakani Municipality
9.2	Jeetpur	11	494	1128	1211	2339	Ward 1 to 5 and 6 of Jeetpur Rural Municipality & Ward 6 to 8 of Tarakeshwar Municipality
	Total	**40**	**1460**	**3343**	**3517**	**6860**	
10.0	**Sindhu-Shivapuri User Committee**						**(Number of UG- 18)**
10.1	Haibung	6	294	784	788	1572	Ward 1,2,4,7 and 8 of Haibung Rural Municipality
10.2	Bhotechaur	12	583	1437	1336	2973	Ward 1,5,7,8, and 9 of Bhotechaur Municipality
	Total	**18**	**877**	**2221**	**2124**	**4545**	
11.0	**Boudeshwar Mahadev User Committee**						**(Number of UG- 32)**
11.1	Tokha-Chandreshwari	2	132	345	346	631	Ward 2 and 6 of Chandeshwari Rural Municipality, Ward 3 of Tokha Municipality and Ward 1 of Budhanilkantha Municipality
11.2	Jhor-Mahankal	15	681	1602	1710	3312	Ward 1 to 9 of Jhor-Mahankal Rural Municipality and Ward 1 and 2 of Tokha Municipality
11.3	Sangla	12	411	897	912	1809	Ward 1 to 4 and 8 of Sangla Rural Municipality
11.4	Kavresthali	3	147	361	397	758	Ward 1,3 and 4 of Kavresthali Rural Municipality
	Total	**32**	**1371**	**3205**	**3365**	**6510**	
Grand Total		**296**	**12414**	**27845**	**28678**	**56636**	

ANNEX 13

Activitites and Budget for the Management Plan of Shivapuri Nagarjun National Park

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
1	Infrastructure Construction /Maintenace and Fascilities Improvement																
1.1	Building Construction/Maintenace and Fascilities Improvement																
a	Post Constrution work	No	7	6000000	42000000	42000	4	24000	1	6000	1	6000	1	6000			
	Post Renovation work	No	1	1500000	1500000	1500	1	1500									
b	Range Post Construction Work	No	5	8500000	42500000	42500	1	8500	2	17000	1	8500	1	8500			
c	Sector Office Construction	No	3	10500000	31500000	31500	1	10500	1	10500	1	10500					
d	Security Guard Post Construction	No	5	5000000	25000000	25000	1	5000	1	5000	1	5000	1	5000	1	5000	
e	Office Buildling Construction	No	1	15000000	15000000	15000	1	15000									
f	Guest House Constrution	No	1	7000000	7000000	7000									1	7000	
g	Staff Quarter	No	1	15000000	15000000	15000							0.5	7500	0.5	7500	
h	Office /Post Building and other fascilities (Toilet,Drinking Water etc.) Maintenance work	Year	5	2000000	10000000	10000	1	2000	1	2000	1	2000	1	2000	1	2000	

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
i	Security Guard Post Maintenance work	Year	5	500000	2500000	2500	1	500	1	500	1	500	1	500	1	500	
j	Custody Building Maintenance work	No	1	2000000	2000000	2000					1	2000					
K	Solar Electriith installation in office and Post	No	25	150000	3750000	3750	5	750	5	750	5	750	5	750	5	750	
	Sub-Total=				197750000	197750		67750		41750		35250		30250		22750	
1.2	Road/trails construction & improvement																
a	Forest road Maintenance work	Km	180	25000	4500000	4500	36	900	36	900	36	900	36	900	36	900	
b	All weather road improvement work	Km	60	150000	9000000	9000	12	1800	12	1800	12	1800	12	1800	12	1800	
c	Retaining/Breast wall	Place	5	500000	2500000	2500	1	500	1	500	1	500	1	500	1	500	
d	Causeway Construction	Place	10	200000	2000000	2000	2	400	2	400	2	400	2	400	2	400	
e	Wooden Bridge Construction Work	Place	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Sub-Total=				19000000	19000		3800		3800		3800		3800		3800	
2	Habitat Management																
a	Wetland Management																
	Conservation Pond/Water hole	Times	5	400000	2000000	2000	1	400	1	400	1	400	1	400	1	400	
	River Sanitation	Times	5	400000	2000000	2000	1	400	1	400	1	400	1	400	1	400	
	Co-ordination and networking to regulate Query and sand/Gravel excavation,	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
b	Grassland Management	Hac	100	20000	2000000	2000	20	400	20	400	20	400	20	400	20	400	

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
c	Forest management																
	Quercus restoration	Place	3	300000	900000	900			2	600			1	300			
	Pine Forest conversion	Place	3	1000000	3000000	3000	1	1000	1	1000	1	1000					
	Seed traping and seedling promotion	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
d	Fire management																
	Equipment purchase	Times	5	150000	750000	750	1	150	1	150	1	150	1	150	1	150	
	Co-ordination with ug,uc,local stakeholders and security official	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Fire Field Gear for staff	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Fire management Plan Preparation	Times	1	500000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Burning Material Collection	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Fire line maintenace work	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Mobiliazation of staff,security and local user's	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Media Campaign for fire prevention	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Fire fighting trainings	Times	2	200000	400000	400	1	200			1	200					
	Sub-Total=				16550000	16550		3650		4050		3650		2750		2450	
3	Species Conservation ,Research and Monitoring Activities																
a	Research																

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Common Leopard count	Times	2	1250000	2500000	2500	1	1250							1	1250	
	Clouded Leopard study	Times	1	200000	200000	200							1	200			
	Himalayan Black Bear	Times	1	200000	200000	200			1	200							
	Small Mammals Study	Times	1	300000	300000	300					1	300					
	Reptiles and Amphibians Study	Times	1	300000	300000	300									1	300	
	Pangolin Study	Times	1	200000	200000	200	1	200									
	Fish and aquatic life study	Times	1	300000	300000	300					1	300					
	Sambar Population and Habitat Study	Times	1	200000	200000	200			1	200							
	Birds	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Inscets	Times	1	300000	300000	300							1	300			
	Vegetation dynamics	Times	1	300000	300000	300							1	300			
	Carrying capacity / radio collar	Times	1	1000000	1000000	1000					1	1000					
	Mid-winter Water Bird Count	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Study on Tourism Impact in SNNP	Times	1	200000	200000	200	1	200									
b	Monitoring																
	Common leopard conservation	Times	1	50000	50000	50	1	50									
	Clouded leoparad conservation	Times	1	50000	50000	50			1	50							
	Pangolian conservation	Times	1	50000	50000	50					1	50					
	Spiny babbler consevation	Times	1	50000	50000	50							1	50			
	Vulture Conservation	Times	1	50000	50000	50									1	50	

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Prey species conservation	Times	1	100000	100000	100			1	100							
	Sub-Total=				7350000	7350		1900		750		1850		1050		1800	
4	Strengthening intelligence network and Anti-Poaching																
	Encroachment data base update and Control	Times	1	300000	300000	300	1	300									
	Mobility(Sweep operation,Long range patrolling,Day Night Patrolling)	Times	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Initiating Real time smart patrolling	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Mobiliazation and Strengthening of CBAPO	No	11	100000	1100000	1100	3	300	2	200	2	200	2	200	2	200	
	Equipment for Anti-poaching Operation(Night vision Bionacular,Tent,Sleeping bags,Cameras)	Times	1	500000	500000	500	1	500									
	Information Collection,Purchasing	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Preparation of SNNP Regulation	Times	1	300000	300000	300	1	300									
	Sub-Total=				5200000	5200		2000		800		800		800		800	
5	Human Wildlife Conflict																
	Boundary Wall maintenance Work	Area	5	4000000	20000000	20000	1	4000	1	4000	1	4000	1	4000	1	4000	
	Equipment for Wildlife Rescue	Times	1	500000	500000	500	1	500									

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Sub-Total=				20500000	20500		4500		4000		4000		4000		4000	
6	Eco-Tourism																
	Cultural Heritage Site conservation	Place	15	300000	4500000	4500	3	900	3	900	3	900	3	900	3	900	
	Signage improvement Work	Times	5	400000	2000000	2000	1	400	1	400	1	400	1	400	1	400	
	Tourist Bishram Sthal Construction	Place	5	500000	2500000	2500	1	500	1	500	1	500	1	500	1	500	
	Interpretation Centre Development	No	1	10000000	10000000	10000							1	10000			
	Foot trail improvement work	M	1000	10000	10000000	10000	200	2000	200	2000	200	2000	200	2000	200	2000	
	Waste management(Plastic restriction)	Times	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Preparation of Eco-Tourism Plan of SNNP	Times	1	500000	500000	500	1	500									
	Toilet Fascility development	Place	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Developed tented Camp Fascilities in Specified Core area sites.	Place	3	500000	1500000	1500	1	500	1	500			1	500			
	View Tower Construction Work	Place	3	500000	1500000	1500			1	500			1	500	1	500	
	Sub-Total=				35500000	35500		5400		5400		4400		15400		4900	
7	Conservation Awareness Programme																
	Celebration days	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Park establishment days	Times	5	500000	2500000	2500	1	500	1	500	1	500	1	500	1	500	
	Conservation education	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Workshop with stakeholders	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Brochure,Pamphlet about Conservation	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Conservation awareness through local media	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Eco-club Support	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Audio-Visual Show	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Sub-Total=				7000000	7000		1400		1400		1400		1400		1400	
8	Capacity Building																
	GIS & RS Training	Times	1	300000	300000	300	1	300									
	Census techniques training	Times	1	300000	300000	300			1	300							
	Tranquillization	Times	1	500000	500000	500					1	500					
	Appreciative Participatory Planning approach training	Times	1	200000	200000	200							1	200			
	Fire fighting trainings	No	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Capacity Building training on Wildlife Crime(Legal Procedure training,Wildlife Parts identification,Wilflife crime scenes investigation training)	No	3	200000	600000	600	1	200	1	200	1	200					
	Conflict management Training	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Orientation Training for new recurits on Wildlife management Training	Times	2	100000	200000	200	1	100					1	100			

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Training on Wildlife Rescue	Times	4	100000	400000	400			1	100	1	100	1	100	1	100	
	Sub-Total=				4000000	4000		900		900		1100		700		400	
9	Special Programmes																
	Awareness programme	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Fisibility study	Times	1	500000	500000	500	1	500									
	Consultation meeting	Times	5	200000	1000000	1000	1	200	1	200	1	200	1	200	1	200	
	Climate-forest-agriculture conservation link-up programme	Times	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Integrated Pest Management and Smart Farming Practices	Times	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Climate and Food security Programme	Times	5	300000	1500000	1500	1	300	1	300	1	300	1	300	1	300	
	Establish Data Center	Place	1	2300000	2300000	2300							1	2300			
	Sub-Total=				9300000	9300		1800		1300		1300		3600		1300	
10	Watershed and Wetland management																
	Riverside Plantation	Area	2	500000	1000000	1000	1	500					1	500			
	Awareness programme	Times	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Landslide treatment	Times	3	500000	1500000	1500	1	300	1	300		300	1	300	1	300	
	Sub-Total=				3000000	3000		900		400		400		900		400	
11	Office Management Cost																
	Vehicle and Maintenance																
	Vehicle Purchase	No	3	5000000	15000000	15000	1	5000	1	5000	1	5000					
	Mobtorbike Purchase	No	10	300000	3000000	3000	10	3000									

SN	Activities	unit	Quantity	Rate	Total Amount	Amount in Thousands	Year 1		Year 2		Year 3		Year 4		Year 5		Remarks
							Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
	Vehicle maintenance	Year	5	1000000	5000000	5000	1	1000	1	1000	1	1000	1	1000	1	1000	
	Third Party and Vehicle insurance	Year	5	100000	500000	500	1	100	1	100	1	100	1	100	1	100	
	Fuel for Vehicles	Year	5	1000000	5000000	5000	1	1000	1	1000	1	1000	1	1000	1	1000	
	Office running cost	Year	5	1600000	8000000	8000	1	1600	1	1600	1	1600	1	1600	1	1600	
	Salary	Year	5	45000000	225000000	225000	1	45000	1	45000	1	45000	1	45000	1	45000	
	Sub -total=				261500000	261500		56700		53700		53700		48700		48700	
	Total =				586650000	586650		150700		118250		111650		113350		92700	

Activitites and Budget of the Management Plan of Shivapuri Nagarjun National Buffer zone for Five Year's Gurje Bhanjyang User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
1.1	Water Resource conservation	400000	400000	400000	400000	400000	2000000	
1.2	Plantation Programme	150000	150000	150000	150000	150000	750000	
1.3	Water Resource Sanitation programme	200000	200000	200000	200000	200000	1000000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
2	Human Wildlife conflict and Relief (25%)							
2.1	Wildlife Damage Compensiation	700000	700000	700000	700000	700000	3500000	
2.2	National Park's wall construction and repair	450000	450000	450000	450000	450000	2250000	
2.3	Alternative Crop management	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							
3.1	Drinking Water	50000	50000	50000	50000	50000	50000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
3.2	Irrigation	0	200000	0	100000	100000	400000	
3.3	Road maintenance	0	150000	250000	200000	200000	800000	
3.4	School Support	0	0	100000	50000	50000	200000	
3.5	Public toilet	0	0	400000	0	0	400000	
3.6	Alternative Energy Support	100000	0	0	150000	150000	400000	
3.7	Community Building	1500000	0	0	0	0	1500000	
	Sub-Total=	1650000	400000	800000	550000	550000	3750000	
4	Eco tourism and income generation and skill development (20%)							
4.1	Temple Renovation	250000	250000	0	200000	250000	950000	
4.2	Home stay	350000	0	0	0	0	350000	
4.3	Skill Development training	350000	350000	400000	400000	350000	1850000	
4.4	Information Board	50000	50000	50000	50000	50000	250000	
4.5	View Tower	0	0	500000	500000	100000	1100000	
4.6	Tour Progrmme	0	0	0	250000	250000	500000	
	Sub-Total=	1000000	650000	950000	1400000	1000000	5000000	
5	Conservation Education(10%)							
5.1	School support programme	200000	200000	200000	200000	200000	1000000	
5.2	Educational Tour	200000	200000	200000	200000	200000	1000000	
5.3	Construction of Extension Materials and Distribution	50000	50000	50000	50000	50000	250000	
5.4	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
6.1	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
6.2	Salary	250000	275000	302500	332750	366025	1526275	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
6.3	Stationary	50000	60000	66000	72600	79860	328460	
6.4	TADA	50000	55000	60500	66550	73205	305255	
6.5	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	5900000	4300000	5000000	5200000	4800000	25000000	
	Total Budget for 5 Year's(In Thousands	5900	4300	5000	5200	4800	25000	

Kakani Okharpauwa User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Water Resource conservation	250000	250000	250000	250000	250000	1250000	
	Plantation Programme	150000	0	180000	180000	240000	750000	
	Water Resource Sanitation programme	200000	200000	200000	200000	200000	1000000	
	Community Empowerment and Awareness campeign	100000	100000	100000	100000	100000	500000	
	Poaching controlling methods training	50000	50000	50000	50000	50000	250000	
	Sub-Total=	750000	600000	780000	780000	840000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Wildlife Damage Compensiation	700000	700000	700000	700000	700000	3500000	
	National Park's wall construction and repair	400000	400000	400000	400000	400000	2000000	
	Alternative Crop management	100000	100000	100000	100000	100000	500000	
	Forest Watcher's management	50000	50000	50000	50000	50000	250000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							
	Drinking Water	50000	0	0	250000	250000	550000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Irrigation	0	50000	0	100000	100000	250000	
	Road maintenance	0	150000	200000	200000	100000	650000	
	Foot Trial maintenance	50000	0	100000	50000	0	200000	
	Public toilet	0	0	200000	0	0	200000	
	Chihan maintenance	0	100000	200000	100000	0	400000	
	Community Sanitation Programme	50000	50000	50000	50000	50000	250000	
	Visitors Inn	0	0	0	0	250000	250000	
	Community Building	600000	400000	0	0	0	1000000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
4	Eco tourism and income generation and skill development (20%)							
	Temple Renovation	450000	150000	0	200000	200000	1000000	
	Home stay	0	350000	350000	50000	50000	800000	
	Cannoning study	50000	0	0	0	0	50000	
	Jeepline and Rock climbing Maintenance	100000	100000	100000	100000	100000	500000	
	Skill Development training	350000	350000	350000	350000	350000	1750000	
	Information Board	50000	50000	50000	50000	50000	250000	
	Tour Progrmme	0	0	150000	250000	250000	650000	
	Sub-Total=	1000000	1000000	1000000	1000000	1000000	5000000	
5	Conservation Education(10%)							
	School support programme	200000	200000	200000	200000	200000	1000000	
	Educational Tour	200000	200000	200000	200000	200000	1000000	
	Construction of Extension Materials and Distribution	50000	50000	50000	50000	50000	250000	
	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Furnishing+Electronic applinces	250000	250000	250000	250000	250000	1250000	
	Salary	300000	300000	300000	300000	300000	1500000	
	Stationary	60000	60000	60000	60000	60000	300000	
	TADA	40000	40000	40000	40000	40000	200000	
	Others	100000	100000	100000	100000	100000	500000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	5000000	4850000	5030000	5030000	5090000	25000000	
	Total Budget for 5 Year's(In Thousands	5000	4850	5030	5030	5090	25000	

Boudeshwar Mahadev User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Water Resource conservation	250000	250000	250000	250000	250000	1250000	
	Plantation Programme	150000	150000	150000	150000	150000	750000	
	Water Resource Sanitation programme	200000	200000	200000	200000	200000	1000000	
	Community Empowerment and Awareness campeign	100000	100000	100000	100000	100000	500000	
	Poaching controlling methods training	50000	50000	50000	50000	50000	250000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Wildlife Damage Compensiation	400000	400000	400000	400000	400000	2000000	
	National Park's wall construction and repair	600000	600000	600000	600000	600000	3000000	
	Alternative Crop management	150000	150000	150000	150000	150000	750000	
	Forest Watcher's management	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Drinking Water	100000	100000	50000	250000	300000	800000	
	Irrigation	0	50000	150000	200000	100000	500000	
	Road maintenance	100000	150000	200000	200000	300000	950000	
	Public toilet	50000	0	250000	50000	0	350000	
	Community Sanitation Programme	0	50000	50000	50000	50000	200000	
	Community Building	500000	400000	50000	0	0	950000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Temple Renovation	300000	100000	50000	200000	250000	900000	
	Skill Development training	400000	200000	500000	450000	450000	2000000	
	Information Board	50000	450000	100000	100000	50000	750000	
	Tour Progrmme	250000	100000	250000	250000	250000	1100000	
	Picnic park	0	150000	100000	0	0	250000	
	Sub-Total=	1000000	1000000	1000000	1000000	1000000	5000000	
5	Conservation Education(10%)							
	School support programme	100000	100000	100000	100000	100000	500000	
	Educational Tour	175000	175000	175000	175000	175000	875000	
	Construction of Extension Materials and Distribution	50000	50000	50000	50000	50000	250000	
	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Celebration Day (Environment,Wetland etc)	50000	50000	50000	50000	50000	250000	
	Forest fire control education	75000	75000	75000	75000	75000	375000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	5000000	5000000	5000000	5000000	5000000	25000000	
	Total Budget for 5 Year's(In Thousands	5000	5000	5000	5000	5000	25000	

Ramkot bhimdhunga chatredeurali User's Committee

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme 15%							
	Wetland conservation	100	100	100	100	100	500	
	Forest management	100	100	100	100	100	500	
	Fire control mechanisam	100	100	100	100	100	500	
	Cultural sites Conservation	300	300	300	300	300	1500	
	Plastic Control Programme	50	50	50	50	50	250	
	Cleanup Programme of Water resources	50	50	50	50	50	250	
	Waste management	50	50	50	50	50	250	
	Sub-total Amount	750	750	750	750	750	3750	
2	Human Wildlife Conflict Resolution 25%							
	Maintenance of Boundary wall	1800	1800	1800	0	0	5400	
	Compensation for Victim	10	10	10	10	10	50	
	Scholarship programme	25	25	25	25	0	100	
	Human-wildlife Conflict Resolution awarness Programme	80	80	80	80	80	400	
	Alternative Crop Promotion	60	60	60	60	60	300	
	Sub-total Amount	1975	1975	1975	175	150	6250	

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
3	Community Development Programme 15%							
	Drinking water schemes as per procedure	200	200	0	200	0	600	
	Road maintenance	200	200	200	200	0	800	
	Users committee Office Building Construction work	2550	200	0	0	0	2750	
	Sub-total Amount	2950	200	200	400	0	3750	
4	Eco-Tourism and Income genearation and Skill development 20%							
	Nature Guide training	50	50	50	50	50	250	
	leadership training	50	50	50	50	50	250	
	Skilled building Training(Plumbing,Beautician,Drivi ng and other necessary trainings)	0	0	50	50	50	150	
	Homestay Development	0	500	0	0	0	500	
	Souvenior shop development	0	0	300	0	0	300	
	Signage development	100	100	100	100	100	500	
	Tourist resting place construction	0	100	0	100	100	300	
	Recreation Park Costruction	0	0	0	100	0	100	
	View-Tower Construction	0	0	250	0	0	250	
	User group mobiliazation Training	200	200	200	200	200	1000	
	Social Mobiliazation training	100	0	0	0	0	100	
	Trail maintenance work	0	0	0	600	0	600	
	Garbage Pit Construction	40	40	40	40	40	200	
	Homestay training	100	100	100	100	100	500	
	Sub-total Amount	640	1140	1140	1390	690	5000	
5	Conservation education Programme 10%							
	Celebration days	50	50	50	50	50	250	
	Conservation liabrary establishment	300	0	0	0	0	300	
	Workshop with stakeholders	40	40	40	40	40	200	

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Brochure,Pamphlet about Conservation	15	15	15	15	15	75	
	Conservation awarness through local media	15	15	15	15	15	75	
	Eco-club Support	25	25	25	25	25	125	
	Eco-club Networking formation	40	0	0	0	0	40	
	Environment Teacher's Networking formation	35	0	0	0	0	35	
	Audio visual/Road show/Drama	80	80	80	80	80	400	
	Conservation Tour	200	200	200	200	200	1000	
	Sub-total Amount	800	425	425	425	425	2500	
6	Administration Cost 15%							
	Salary for Office Assistant,Social Mobilizer	300	300	300	300	300	1500	
	Office Running Cost	340	340	340	340	340	1700	
	Equipment(Computer,Printer,Scanner,Bionacular)	300	0	0	0	0	300	
	Furnishing	150	0	0	0	0	150	
	Awards n prize for ug	20	20	20	20	20	100	
	Sub-total Amount	1110	660	660	660	660	3750	
	Total Amount for 5 years Programme	8225	4950	5150	3800	5105	25000	

Sindhu Shivapuri User's Committee

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
1	Conservation Programme(15%)							
	Embankment Construction	450000	300000	300000	300000	300000	1650000	
	Water Resource Sanitation programme	250000	200000	200000	200000	200000	1050000	
	Cultural Heritage Conservation	200000	200000	200000	200000	200000	1000000	
	Antipoaching activities	10000	10000	10000	10000	10000	50000	

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
	Sub-Total=	910000	710000	710000	710000	710000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Wildlife Damage Compensiation	50000	50000	50000	50000	50000	250000	
	National Park's wall construction and repair	900000	900000	900000	900000	900000	4500000	
	Alternative Crop management	200000	200000	200000	200000	200000	1000000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							
	Community Building	3000000	0	0	0	0	3000000	
	Irrigation	50000	50000	50000	50000	50000	250000	
	Public toilet	0	0	300000	0	0	300000	
	Community Sanitation Programme	0	50000	50000	50000	50000	200000	
	Sub-Total=	3050000	100000	400000	100000	100000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Leadership training	300000	300000	300000	300000	300000	1500000	
	Homestay development	500000	0	500000	0	0	1000000	
	Information Board	100000	100000	100000	100000	100000	500000	
	Tea Cropping	20000	20000	20000	20000	20000	100000	
	View Tower Construction	300000	0	0	0	300000	600000	
	Tourist Resting Place Construction	200000	200000	200000	200000	200000	1000000	
	Skill Development Training	100000	100000	100000	0	0	300000	
	Sub-Total=	1520000	720000	1220000	620000	920000	5000000	
5	Conservation Education(10%)							
	School support programme	100000	100000	100000	100000	100000	500000	
	Educational Tour	175000	175000	175000	175000	175000	875000	

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
	Conservation liabrary establishment	50000	50000	50000	50000	50000	250000	
	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Celebration Day (Environment,Wetland etc)	50000	50000	50000	50000	50000	250000	
	Forest fire control education	75000	75000	75000	75000	75000	375000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	7980000	4030000	4830000	3930000	4230000	25000000	
	Total Budget for 5 Year's(In Thousands	7980	4030	4830	3930	4230	25000	

Bishnu Chapali User's Committee

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
1	Conservation Programme(15%)							
	Plantation programme	100000	100000	100000	100000	100000	500000	
	Embankment Construction	200000	200000	200000	200000	200000	1000000	
	Cultural Heritage Conservation	200000	200000	200000	200000	200000	1000000	
	River Sanitation Programme	50000	50000	50000	50000	50000	250000	

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
	Antipoaching activities	50000	50000	50000	50000	50000	250000	
	Fire reduction Prograame	150000	150000	150000	150000	150000	750000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Wildlife Damage Compensiation	100000	100000	100000	100000	100000	500000	
	Boundary wall construction and repair	850000	850000	850000	850000	850000	4250000	
	Alternative Crop management	200000	200000	200000	200000	200000	1000000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							
	Community Building	2000000	0	0	0	0	2000000	
	Road maintenance	200000	200000	200000	200000	200000	1000000	
	Public toilet	0	0	300000	0	0	300000	
	Community Sanitation Programme	0	50000	50000	50000	50000	200000	
	Drinking Water Schemes	0	0	0	250000	0	250000	
	Sub-Total=	2200000	250000	550000	500000	250000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Women's empowerment training	200000	200000	0	0	0	400000	
	Nature Guide Training	150000	0	0	150000	0	300000	
	Leadership training	300000	300000	300000	300000	300000	1500000	
	Homestay development	500000	0	500000	0	0	1000000	
	Information Board	100000	100000	100000	100000	100000	500000	
	Picnic spot	200000	0	200000	0	0	400000	

SN	Activites	Amount						Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount for 5 Years	
	Tourist Resting Place Construction			200000	200000		400000	
	Skill Development Training	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1550000	700000	1400000	850000	500000	5000000	
5	Conservation Education(10%)							
	Eco club formation and support	100000	100000	100000	100000	100000	500000	
	Awarness programme about conservation	100000	100000	100000	100000	100000	500000	
	School support programme	100000	100000	100000	100000	100000	500000	
	Educational Tour	175000	175000	175000	175000	175000	875000	
	Conservation liabrary establishment	50000	50000	50000	50000	50000	250000	
	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Celebration Day (Environment,Wetland etc)	50000	50000	50000	50000	50000	250000	
	Forest fire control education	75000	75000	75000	75000	75000	375000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	7000000	4200000	5200000	4600000	4000000	25000000	
	Total Budget for 5 Year's(In Thousands	7000	4200	5200	4600	4000	25000	

Chisapani Shivapuri User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Embankment Construction	200000	200000	200000	200000	200000	1000000	
	Water Resource Sanitation programme	150000	150000	150000	150000	150000	750000	
	Cultural Heritage Conservation	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	150000	150000	150000	150000	150000	750000	
	Fire reduction Prograame	150000	150000	150000	150000	150000	750000	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Wildlife Damage Compensiation	50000	50000	50000	50000	50000	250000	
	Boundary wall construction and repair	900000	900000	900000	900000	900000	4500000	
	Alternative Crop management	200000	200000	200000	200000	200000	1000000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Sub-Total=	1250000	1250000	1250000	1250000	1250000	6250000	
3	Community Development (15%)							
	Community Building	2000000	0	0	0	0	2000000	
	Road maintenance	100000	100000	100000	100000	100000	500000	
	Irrigation	50000	50000	50000	50000	50000	250000	
	Public toilet	0	0	300000	0	0	300000	
	Community Sanitation Programme	0	50000	50000	50000	50000	200000	
	Cultural Heritage Conservation	100000	100000	100000	100000	100000	500000	
	Sub-Total=	2250000	300000	600000	300000	300000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Leadership training	300000	300000	300000	300000	300000	1500000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Homestay development	500000	0	500000	0	0	1000000	
	Information Board	100000	100000	100000	100000	100000	500000	
	Picnic spot	0	0	100000	0	0	100000	
	View Tower Construction	300000	0	0	0	300000	600000	
	Tourist Resting Place Construction	200000	200000	200000	200000	200000	1000000	
	Skill Development Training	100000	100000	100000	0	0	300000	
	Sub-Total=	1500000	700000	1300000	600000	900000	5000000	
5	Conservation Education(10%)							
	School support programme	100000	100000	100000	100000	100000	500000	
	Educational Tour	175000	175000	175000	175000	175000	875000	
	Conservation liabrary establishment	50000	50000	50000	50000	50000	250000	
	Youth awareness programme	50000	50000	50000	50000	50000	250000	
	Celebration Day (Environment,Wetland etc)	50000	50000	50000	50000	50000	250000	
	Forest fire control education	75000	75000	75000	75000	75000	375000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	7000000	4250000	5150000	4150000	4450000	25000000	
	Total Budget for 5 Year's(In Thousands	7000	4250	5150	4150	4450	25000	

Ichangu Narayan User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Community forest management	100000	0	0	0	0	100000	
	Plantation	200000	0	200000	0	250000	650000	
	Cultural Heritage Site Conservation	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	150000	150000	150000	150000	150000	750000	
	Wetland Conservation	200000	200000	200000	200000	200000	1000000	
	Fire reduction Prograame	150000	150000	150000	150000	150000	750000	
	Sub-Total=	900000	600000	800000	600000	850000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Boundary wall construction and repair	1000000	1000000	1000000	1000000	1000000	5000000	
	Wildlife rescue Training	130000	0	0	0	0	130000	
	Alternative Crop management	100000	100000	100000	100000	0	400000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	100000	100000	10000	10000	0	220000	
	Sub-Total=	1430000	1300000	1210000	1210000	1100000	6250000	
3	Community Development (15%)							
	Community Building	2500000	0	0	0	0	2500000	
	Drinking water schemes	100000	100000	100000	100000	100000	500000	
	Tourist trail maintenance	125000	0	0	125000	0	250000	
	Public toilet	0	0	300000	0	0	300000	
	Community Sanitation Programme	0	50000	50000	50000	50000	200000	
	Sub-Total=	2725000	150000	450000	275000	150000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Homestay development	500000	0	500000	0	0	1000000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Conservation education tour	300000	0	300000	0	300000	900000	
	Information Board	200000	200000	100000	100000	100000	700000	
	Picnic spot	0	0	400000	0	0	400000	
	Skill Development Training	200000	200000	200000	0	0	600000	
	Community mobiliazation training	700000	0	0	0	0	700000	
	Nature Guide Training	200000	0	0	0	0	200000	
	Tourist resting place construction	100000	100000	100000	100000	100000	500000	
	Sub-Total=	2200000	500000	1600000	200000	500000	5000000	
5	Conservation Education(10%)							
	School support programme	100000	100000	100000	100000	100000	500000	
	Conservation liabrary establishment	500000	0	0	0	0	500000	
	Youth awareness programme	100000	100000	100000	100000	100000	500000	
	Celebration Day (Environment,Wetland etc)	100000	100000	100000	100000	100000	500000	
	Forest fire control education	100000	100000	100000	100000	100000	500000	
	Sub-Total=	900000	400000	400000	400000	400000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	8905000	3700000	5210000	3435000	3750000	25000000	
	Total Budget for 5 Year's(In Thousands	8905	3700	5210	3435	3750	25000	

Manichud Kageshwari User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Community forest management	100000	100000	100000	0	0	300000	
	Plantation	200000	0	200000	0	200000	600000	
	Cultural Heritage Site Conservation	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	150000	150000	150000	150000	150000	750000	
	Wetland Conservation	200000	200000	200000	0	0	600000	
	Fire reduction Prograame	200000	200000	200000	200000	200000	1000000	
	Sub-Total=	950000	750000	950000	450000	650000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Boundary wall construction and repair	1000000	1000000	1000000	1000000	1000000	5000000	
	Quick response Team mobiliazation	130000	0	0	0	0	130000	
	Alternative Crop management	100000	100000	100000	100000	0	400000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	100000	100000	10000	10000	0	220000	
	Sub-Total=	1430000	1300000	1210000	1210000	1100000	6250000	
3	Community Development (15%)							
	Community Building	2500000	0	0	0	0	2500000	
	Drinking water schemes	100000	100000	100000	100000	100000	500000	
	Tourist trail maintenance	125000	0	0	125000	0	250000	
	Culvert Construction	0	300000	0	0	0	300000	
	Gumba Construction/Maintenance	0	200000	0	0	0	200000	
	Sub-Total=	2725000	600000	100000	225000	100000	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Alternative Crop management training	200000	200000	0	0	0	400000	
	Conservation education tour	300000	0	300000	0	300000	900000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Homestay construction	500000	0	500000	0	0	1000000	
	Homestay training	200000	0	200000	0	0	400000	
	Skill Development Training	200000	200000	200000	0	0	600000	
	Community mobiliazation training	700000	0	0	0	0	700000	
	Nature Guide Training	200000	0	0	0	0	200000	
	Tourist resting place construction	100000	100000	100000	100000	100000	500000	
	View Tower Construction	0	0	300000	0	0	300000	
	Sub-Total=	2400000	500000	1600000	100000	400000	5000000	
5	Conservation Education(10%)							
	Ecoclub formation and Support	100000	100000	100000	100000	100000	500000	
	Signboard Constrction	100000	100000	100000	100000	100000	500000	
	Youth awareness programme	100000	100000	100000	100000	100000	500000	
	Celebration Day (Environment,Wetland etc)	100000	100000	100000	100000	100000	500000	
	Forest fire control education	100000	100000	100000	100000	100000	500000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	8755000	4400000	5110000	3235000	3500000	25000000	
	Total Budget for 5 Year's(In Thousands	8755	4400	5110	3235	3500	25000	

Sundarijal Shivapuri User's Committee

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme(15%)							
	Wetland Conservation	200000	200000	200000	200000	200000	1000000	
	Plantation	200000	0	200000	0	200000	600000	
	Cultural Heritage Site Conservation	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	100000	100000	100000	100000	100000	500000	
	Watersource Conservation	100000	100000	100000	0	0	300000	
	Fire reduction Prograame	0	200000	200000	200000	250000	850000	
	Sub-Total=	700000	700000	900000	600000	850000	3750000	
2	Human Wildlife conflict and Relief (25%)							
	Boundary wall construction and repair	1000000	1000000	1000000	1000000	1000000	5000000	
	Alternative Crop management	100000	100000	100000	100000	0	400000	
	Scholarship	100000	100000	100000	100000	100000	500000	
	Antipoaching activities	100000	100000	0	0	0	200000	
	Compensation for Wildlife Victim	30000	30000	30000	30000	30000	150000	
	Sub-Total=	1330000	1330000	1230000	1230000	1130000	6250000	
3	Community Development (15%)							
	Community Building	3000000	0	0	0	0	3000000	
	Tourist trail maintenance	250000	250000	250000	0	0	750000	
	Sub-Total=	3250000	250000	250000	0	0	3750000	
4	Eco tourism ,income generation and skill development (20%)							
	Hotel management Training	200000	200000	0	0	0	400000	
	Conservation education tour	300000	0	300000	0	300000	900000	

SN	Activites	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Homestay construction	500000	0	500000	0	0	1000000	
	Homestay training	200000	0	200000	0	0	400000	
	Skill Development Training	200000	200000	200000	0	0	600000	
	Community mobiliazation training	700000	0	0	0	0	700000	
	Nature Guide Training	200000	0	0	0	0	200000	
	Tourist resting place construction	300000	0	300000	0	200000	800000	
	Sub-Total=	2600000	400000	1500000	0	500000	5000000	
5	Conservation Education(10%)							
	Ecoclub formation and Support	100000	100000	100000	100000	100000	500000	
	Signboard Constrction	100000	100000	100000	100000	100000	500000	
	Youth awareness programme	100000	100000	100000	100000	100000	500000	
	Celebration Day (Environment,Wetland etc)	100000	100000	100000	100000	100000	500000	
	Forest fire control education	100000	100000	100000	100000	100000	500000	
	Sub-Total=	500000	500000	500000	500000	500000	2500000	
6	Administrative cost (15%)							
	Furnishing+electronic appliances	350000	200000	200000	200000	150000	1100000	
	Salary	250000	275000	302500	332750	366025	1526275	
	Stationary	50000	60000	66000	72600	79860	328460	
	TADA	50000	55000	60500	66550	73205	305255	
	Others	50000	160000	121000	78100	80910	490010	
	Sub-Total=	750000	750000	750000	750000	750000	3750000	
	Total Budget for 5 Year's	9130000	3930000	5130000	3080000	3730000	25000000	
	Total Budget for 5 Year's(In Thousands	9130	3930	5130	3080	3730	25000	

Goldhunga jeetpur User's Committee

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
1	Conservation Programme 15%							
A	Sustainable managed of Community forest							
	Nuresery establishment	400	0	0	0	0	400	
	Plantation	180	180	180	180	180	900	
	Community Forest management training	60	60	60	60	60	300	
B	Fire control mechanisam							
	Awareness programme	40	40	40	40	40	200	
	Fire control tools equipment	200	0	0	0	0	200	
	QRT work plan preparation/Training/Workshop	20	20	20	20	20	100	
C	Cultural sites Conservation	220	220	220	220	220	1100	
D	Plastic Control Programme	50	50	50	50	50	250	
E	Cleanup Programme of Water resources	30	30	30	30	30	150	
F	Waste management	30	30	30	30	30	150	
	Sub-total Amount	1230	630	630	630	630	3750	
2	Human Wildlife Conflict Resolution 25%							
	Maintenance of Boundary wall	1800	1800	1800	0	0	5400	
	Compensation for Victim	10	10	10	10	10	50	
	Scholarship programme	25	25	25	25	0	100	
	Human-wildlife Conflict Resolution awarness Programme	80	80	80	80	80	400	
	Alternative Crop Promotion	60	60	60	60	60	300	
	Sub-total Amount	1975	1975	1975	175	150	6250	
3	Community Development Programme 15%							
	Drinking water schemes as per procedure	200	0	0	200	0	400	

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Road maintenance	0	0	100	0	0	100	
	Users committee Office Building Construction work	3250	0	0	0	0	3250	
	Sub-total Amount	3450		100	200		3750	
4	Tourism development,Income genearation and Skill development 20%							
	Nature Guide training	50	50	50	50	50	250	
	leadership training	50	50	50	50	50	250	
	Skilled building Training(Plumbing,Beautician,Driving and other necessary trainings)	0	0	50	50	50	150	
	Homestay Development	0	500	0	0	0	500	
	Souvenior shop development	0	0	300	0	0	300	
	Signage development	100	100	100	100	100	500	
	Tourist resting place construction	0	100	0	100	100	300	
	Recreation Park Costruction	0	0	0	100	0	100	
	View-Tower Construction	0	0	250	0	0	250	
	User group mobiliazation Training	200	200	200	200	200		
	Social Mobiliazation training	100	0	0	0	0	100	
	Trail maintenance work	0	0	0	600	0	600	
	Garbage Pit Construction	40	40	40	40	40	200	
	Homestay training	100	100	100	100	100	500	
	Sub-total Amount	640	1140	1140	1390	690	5000	
5	Conservation education Programme 10%							
	Celebration days	50	50	50	50	50	250	
	Conservation liabrary establishment	300					300	
	Workshop with stakeholders	40	40	40	40	40	200	

SN	Activities	Amount					Total Amount for 5 Years	Remarks
		Year 1	Year 2	Year 3	Year 4	Year 5		
	Brochure,Pamphlet about Conservation	15	15	15	15	15	75	
	Conservation awarness through local media	15	15	15	15	15	75	
	Eco-club Support	25	25	25	25	25	125	
	Eco-club Networking formation	40	0	0	0	0	40	
	Environment Teacher's Networking formation	35	0	0	0	0	35	
	Audio visual/Road show/Drama	80	80	80	80	80	400	
	Conservation Tour	200	200	200	200	200	1000	
	Sub-total Amount	800	425	425	425	425	2500	
6	Administration Fascilities,Expenses and Award 15%							
	Salary for Office Assistant,Social Mobilizer	300	300	300	300	300	1500	
	Office Running Cost	340	340	340	340	340	1700	
	Equipment(Computer,Printer,Scanner,Bionacular)	300	0	0	0		300	
	Furnishing	150	0	0	0	0	150	
	Awards n prize for ug	20	20	20	20	20	100	
	Sub-total Amount	1110	660	660	660	660	3750	
	Total Amount for 5 years Programme	9205	4830	4930	3480	2555	25000	

MANAGEMENT PLAN

Fiscal Year 074/075-078/079 (2017/018-2021/022)