



BIODIVERSITY PROFILE OF THE API NAMPA CONSERVATION AREA



Government of Nepal
Ministry of Forests and Environment
Department of National Parks and Wildlife Conservation
Babarmahal, Kathmandu, Nepal



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Technical Team

Mr. Bishnu P. Shrestha, Under-Secretary (Tech.), DNPWC
Dr. Janita Gurung, Programme Coordinator-KSLCDI, ICIMOD
Dr. Binaya Pasakhala, Resource Governance Analyst, ICIMOD
Dr. Suresh K. Ghimire, Associate Professor, Central Department of Botany, Tribhuvan University
Dr. Srijana Joshi, Ecosystem Specialist, ICIMOD
Ms. Sunayana Basnet, Research Associate, ICIMOD
Mr. Sunil Thapa, Remote Sensing and Geoinformation Analyst, ICIMOD
Mr. Prabin Bhandari, PhD Candidate, State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany-CAS
Mr. Bhumiraj Upadhyaya, Under-Secretary (Tech.), DNPWC
Mr. Ashok K. Ram, Assistant Conservation Officer, DNPWC
Ms. Corinna Wallrapp, PhD Candidate, University of Gottingen
Mr. Chandra K. Subedi, Assistant Professor, RECAST, Tribhuvan University
Dr. Kamala Gurung, Gender and Natural Resource Management Specialist, ICIMOD
Mr. Gauri Dangol, Research Associate Digital Cartography, ICIMOD
Mr. Ashish Chaudhary, Manager, Adventure West Holidays
Dr. Ram P. Chaudhary, Professor Emeritus, Tribhuvan University

Review Team

Mr. Man Bahadur Khadka, Director General, DNPWC
Mr. Gopal Prakash Bhattarai, Deputy Director General, DNPWC
Dr. Ram Chandra Kandel, Deputy Director General, DNPWC
Mr. Shyam Bajimaya, Former Director General, DNPWC
Dr. Mukesh K. Chalise, Professor, Central Department of Zoology, Tribhuvan University

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Foreword

The Government of Nepal (GoN) is committed to the Convention on Biological Diversity (CBD) in order to conserve biodiversity and ensure its sustainable use and equitable benefit-sharing. Today, climate change, growing human population and their increasing pressure on ecosystems for subsistence and economic development, pose major threats to biodiversity. Learning from Nepal's success in participatory conservation efforts, the GoN established the Api Nampa Conservation Area (ANCA) in 2010 covering an area of 1,903 sq. km in Darchula District, Sudurpashchim Province in western Nepal.

Extending from tropical forests to alpine rangelands and the high Himalaya, ANCA features various ecosystems that host a variety of flora and fauna, including endemic plants and threatened species such as the Himalayan musk deer and snow leopard. People living in ANCA are mostly dependent on traditional agriculture and pastoralism for their livelihoods, but many are now engaged in the trade of non-timber forest products which has increased significantly in the recent decade.

Bordering China and India, ANCA's ecosystem services have local, national and regional significance. Hence, conservation and development efforts in ANCA are adopting the landscape approach. The GoN established the ANCA office, and at the local level, the ANCA Management Council, formed in 2015, is implementing its five-year Management Plan (2015–2019). Many places in ANCA are remote and inaccessible, so there is limited information on its ecological, sociological and anthropological aspects. Knowledge generated from various research conducted in ANCA requires adequate documentation and data management so that such information can contribute to its effective management.

This document is an effort to bridge the existing information gap on the biodiversity of ANCA. It presents the biological, as well as socio-economic status of ANCA by compiling information from peer-reviewed manuscripts, published and unpublished reports, research theses and consultations with a wide range of stakeholders. The report includes a comprehensive checklist of the flora and fauna found in ANCA. It also assesses threats to biodiversity while identifying opportunities for biodiversity conservation and management.

I extend my appreciation to all the authors and reviewers of this document. I express my special thanks to Prof. Dr. Rameshwar Adhikari, Executive Director, RECAST, Nepal and Mr. Matthias Hartmann of Natural History Museum, Germany, for their support. I am grateful to the Kailash Sacred Landscape Conservation and Development Initiative (KSLCDI) for its technical and financial support in preparing this document. Many thanks to Samuel Thomas, Rachana Chettri, Kundan Shrestha and Sudip Maharjan for layout and production.

I am confident that this report will be helpful for researchers, policymakers, local leaders and other stakeholders working in ANCA and beyond.

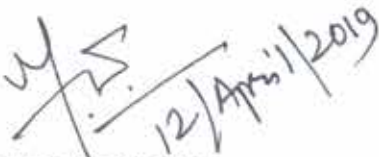

Man Bahadur Khadka
Director General



Photo i: White-winged grosbeak (Credit: Mukesh K. Chalise)

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Photo ii: Rangeland comprise more than a quarter of the total area of ANCA (Credit: Suresh K Ghimire)

Acronyms and Abbreviations

ANCA	Api Nampa Conservation Area
BCN	Bird Conservation Nepal
BS	Bikram Sambat
CBS	Central Bureau of Statistics
CDB	Central Department of Botany
CF	Community forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DMG	Department of Mines and Geology
DNPWC	Department of National Parks and Wildlife Conservation
DPR	Department of Plant Resources
EIA	Environmental impact assessment
GLORIA	Global Observation Research Initiative in Alpine Environments
GoN	Government of Nepal
HDI	Human Development Index
HWC	Human–wildlife conflict
IAPS	Invasive alien plant species
IEE	Institute of Ecology and Environment
ICIMOD	International Centre for Integrated Mountain Development
KATH	National Herbarium and Plant Laboratory
kg	Kilogram
KSL	Kailash Sacred Landscape
kW	Kilowatt
LPG	Liquefied petroleum gas
masl	Metres above sea level
MAP	Medicinal and aromatic plant
MEA	Millenium Ecosystem Assessment
MoFE	Ministry of Forests and Environment
MoFSC	Ministry of Forests and Soil Conservation
MoPE	Ministry of Population and Environment
MoWSS	Ministry of Water Supply and Sewerage
Mt	Mount
MW	Megawatt
NPC	National Planning Commission
NPWCA	National Parks and Wildlife Conservation Act
NTFP	Non-timber forest product
ODF	Open defecation free
RDS	Regional Database System
RECAST	Research Centre for Applied Science and Technology
RM	Rural Municipality
Rs	Nepali Rupee
SCBD	Secretariat of the UN Convention on Biological Diversity

sp.	Species
sq. km	Square kilometre
SRTM	Shuttle Radar Topography Mission
TAR	Tibet Autonomous Region
TU	Tribhuvan University
UNDP	United Nations Development Programme
USD	United States Dollar
VDC	Village Development Committee
WHO	World Health Organization

Executive Summary

The Api Nampa Conservation Area (ANCA), established in 2010 (BS 2067), is spread over an area of 1,903 sq. km in Darchula District, Sudurpashchim Province, in western Nepal. ANCA encompasses parts or all of five Rural Municipalities and one Municipality. Named after two mountain peaks, Mt Api (7,132 masl) and Mt Nampa (6,757 masl), ANCA hosts a wide variety of plants and animals, while also being rich in cultural sacred and spiritual heritage.

This Biodiversity Profile was prepared using the available data from past studies and assessments of several researchers in ANCA. It includes a currently comprehensive checklist of flora (angiosperms, gymnosperms, pteridophytes, fungi and lichens) and fauna (mammals, birds and insects) that serves as a baseline of the present status of biodiversity in ANCA. However, by no means is this checklist complete and additional assessments will surely reveal more species

that can be added to it. This ANCA Biodiversity Profile is useful as a reference document for researchers, development partners and policymakers in the field of biodiversity and conservation in the future.

ANCA is a home to 59,609 local residents, with women comprising 52 per cent of the total population. Distributed in 10,412 households (with an average household size of 4.8 persons) across 440 settlements, the population density is higher in the lower region of ANCA (100–160 persons per sq. km) than in the upper region (less than 70 persons per sq. km). The social groups of Chettri, Brahmin, Thakuri and Dalit collectively comprise over 98 per cent of the population, while the remaining groups include the ethnic groups of Shauka, Tamang and Magar. The Shauka community in Nepal is unique to the upper valleys of ANCA in the high-elevation region of Byas.



Photo iii: Many places in ANCA are remote and inaccessible (Credit: Pradyumna Rana)



Photo iv: Chameliya is one of two major rivers in ANCA (Credit: Pradyumna Rana)

ANCA is characterized by diverse topography and geology within Nepal's high mountain and high Himalayan physiographic zone. These variations result in a diversity of ecosystems, which host a variety of flora and fauna. Among the vegetation types, seven forest types and seven scrub and grassland types have been identified; together, these vegetation types cover almost two-thirds of the total area of ANCA. The floral diversity includes 535 species of angiosperms, 12 species of gymnosperms and 69 species of pteridophytes. The documented faunal diversity includes 43 species of mammals, 263 species of birds, 69 species of fish and at least 64 species of insects. The agro-biodiversity is also rich, with at least 12 varieties of rice, 11 varieties of wheat, 15 varieties of maize, 7 varieties of finger millet, 5 varieties of barley and 11 varieties of beans documented in Khar, Naugad Rural Municipality (RM), alone. Collectively, ANCA's biodiversity provides numerous ecosystem services.

The current assessment of ANCA's biodiversity revealed two endemic plant species, viz. *Delphinium himalayai* Munz and *Scrophularia laportifolia* Yamazaki and two endemic species of snails, viz. *Vallonia costohimala* and *Vallonia himalaevis*. Two of the plant species are globally threatened: *Nardostachys grandiflora* (critically endangered) and *Taxus contorta* (endangered), while ten floral species are nationally protected under various categories. Among the faunal species, three mammals and five birds species are globally threatened, seven mammals and thirteen birds species are nationally threatened, twelve mammals and eight birds are listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendices, while four mammals and three birds species are nationally protected under the National Parks and Wildlife Conservation Act 2029 (1973 AD).

Biodiversity in ANCA faces a number of threats by way of deforestation, forest degradation and habitat fragmentation. Some of these threats are in the form of forest encroachment, infrastructure development and forest fires. Unsustainable harvesting of natural resources, unregulated grazing, illegal trading, poaching and overharvesting of non-timber forest products (NTFPs) are also serious threats to biodiversity in ANCA. Besides, human-wildlife conflict (HWC) is a growing issue of concern in ANCA that can be detrimental to both humans and wildlife as well. Moreover, invasive alien plant species (IAPS), 10 of which have been recorded in ANCA, threaten biodiversity, agriculture and livestock production of ANCA. Though climate change has a significant impacts on biodiversity and ecosystem services, the interaction between climate change and biodiversity has not been adequately assessed in ANCA.

The documented floral diversity includes



535
species of angiosperms



12
species of gymnosperms



69
species of pteridophytes

The documented faunal diversity includes



43
species of mammals



263
species of birds



69
species of fish



64
species of insects

Several enabling policies, legislations and plans are in place to support biodiversity conservation and sustainable development in ANCA. The overarching policies are the National Parks and Wildlife Conservation Act 2029 (1973 AD) and the Conservation Area Management Regulations, which prioritize local stakeholder participation in managing the conservation area. Moreover, the five-year ANCA Management Plan (2015–2019) has identified the key actions and required resources to achieve conservation and the sustainable use of biological resources while enhancing local livelihoods. It is important to note that there are gaps and issues that can negatively impact biodiversity conservation and sustainable development in ANCA. There are, however, also opportunities, which are presented as conservation priorities (policy formulation, identification, implementation and conservation of biodiversity and cultural values, addressing HWCs, engaging the private sector, building climate resilience and achieving transboundary cooperation) and knowledge-management priorities (research, dissemination and database development).



Photo 1.1: ANCA is characterized by diverse topography (Credit: Janita Gurung)

1. Introduction

The Api Nampa Conservation Area (ANCA), established in 2010 AD (2067 BS), is spread over an area of 1,903 sq. km and borders with India to the west and China to the north (Figure 1.1). ANCA encompasses parts or all of five Rural Municipalities (RMs) and one Municipality with a total resident population of approximately 60,000 people, of whom 52 per cent are female and 48 per cent male (CBS 2014). The conservation area is named after two mountains in the area: Mt Api (7,132 masl) and Mt Nampa (6,757 masl).

ANCA hosts a wide variety of plants and wildlife and its human settlements are characterized by their rich cultural heritage. The high mountains are the habitat of the snow leopard while the mid-hill forests are home to populations of the Himalayan musk deer and Himalayan black bear. Several species of trees, shrubs and herbs that are used for various purposes, ranging from utilitarian to cultural and aesthetic, are found in ANCA; and making this area their home since centuries ago are various social groups, including Chhetri, Brahman and Dalit and a number of ethnic groups like the Byansi/Shauka, Magar and Tamang.

Many places in ANCA are remote and inaccessible. So, the explorations—botanical, geological or anthropological—have been limited here in comparison to other parts of Nepal. The first documented botanical survey in Darchula District was done in 1884 by J.F. Duthie of the United Kingdom (Rajbhandari 2015). However, the trend of conducting research in ANCA has steadily increased, especially after it was declared a “conservation area” and a conservation and development programme was implemented in the Kailash Sacred Landscape (MoFSC 2016).

This Biodiversity Profile provides information on the present status of the biodiversity and ecosystem services in ANCA. The profile is a comprehensive checklist of flora and fauna. This document also assesses the threats to biodiversity and tries to explore the opportunities and gaps in its conservation, while focusing on research priorities for the effective management.

This report was prepared using the available information on ANCA. References include peer-reviewed manuscripts, published reports, unpublished documents, research theses and project reports, as well as results from a number of research conducted under the Kailash Sacred Landscape Conservation and Development Initiative (KSLCDI).

ANCA at a glance



Year established
2010 AD (2067 BS)



Area
1903 sq. km



Location
Darchula District



Highest point
Mt Api (7,132 masl)



Population
59,609
(52% female; 48% male)

This ANCA Biodiversity Profile is intended for researchers, conservationists, development partners, decision makers and personnel involved in developing policy, particularly those related to biodiversity and conservation. The comprehensive biodiversity checklist included in this document serves an academic purpose, while also functioning as a baseline database of the current status of biodiversity in ANCA. Attempts have also been made to incorporate the new political boundaries (GoN 2017) of RMs in this report.

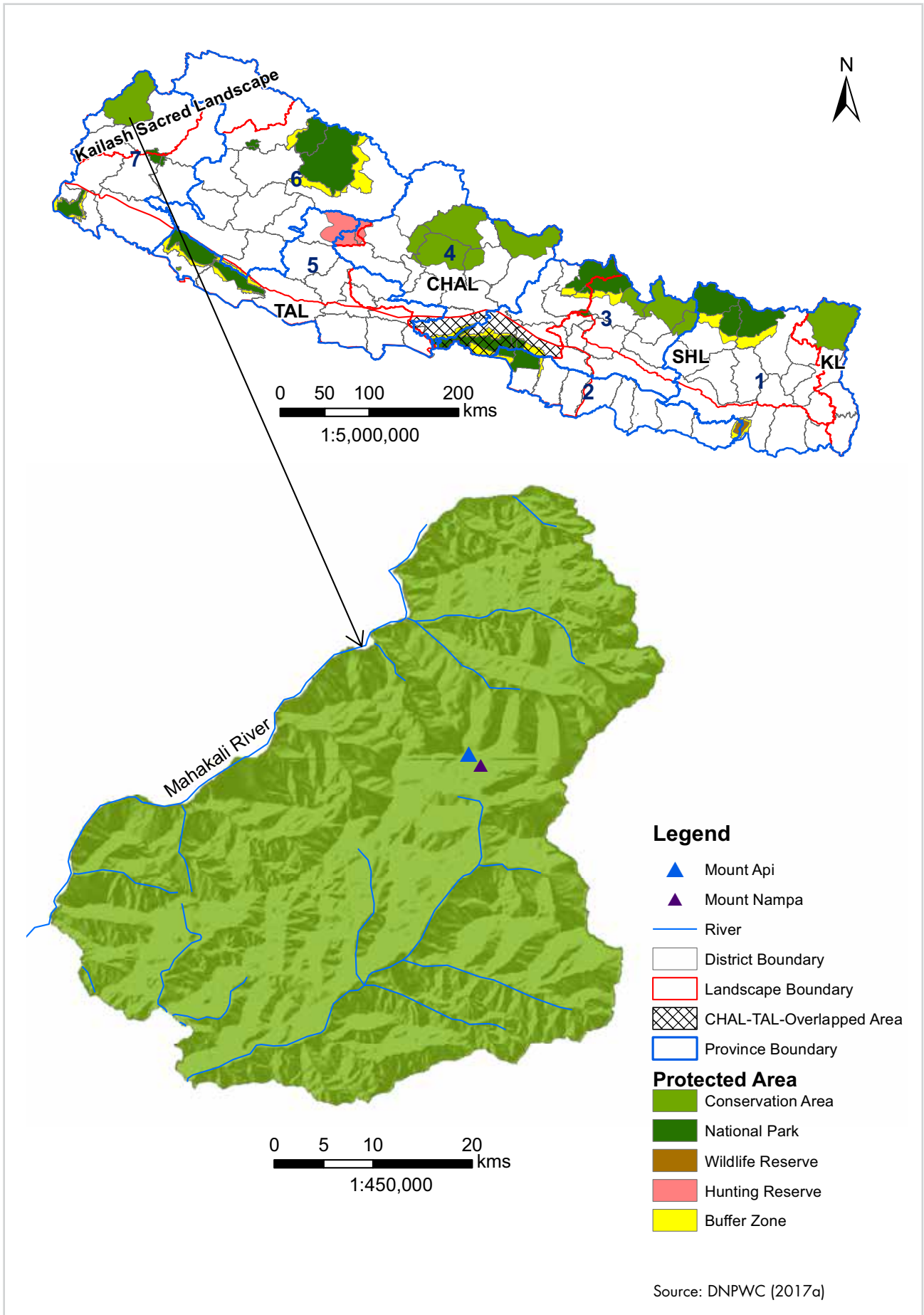


Figure 1.1: Location map of ANCA

2. Physiography of ANCA

2.1. Topography

ANCA falls within two physiographic zones of Nepal: high mountain and high Himalaya (DNPWC 2017a). The area is characterized by steep hills and river valleys in the lower portion and mountains, glaciers and high valleys in the upper portion (Figure 2.1). Elevations range from a low of 539 masl to the highest point of Mt Api at 7,132 masl. Notable mountain peaks in ANCA include Api, Nampa (6,757masl), Jethi Bahurani (6,850 masl) and Byas (6,670 masl). A very small proportion, less than 5 per cent, of ANCA is flat or gently sloping (with a slope less than 5 degrees), while almost two-thirds of the area is steeply sloped (30 degrees slope) (Figure 2.1).

2.2. Geology

The geology of ANCA is the result of a collision of the Indian subcontinent plate with the Tibetan plate that formed the Himalaya (DNPWC 2017a). It mostly comprises schist, gneiss, limestone and sedimentary rocks, along with rocks such as granite, pegmatite, phyllite and quartzite. Four geological groups—Himal Group, Kathmandu Group, MidLand Group and Nawakot Group—are prominently featured in ANCA, while a small portion in the lower belt consists of the Surkhet Group (Figure 2.2) (Dhital 2015). The geological nature of ANCA predisposes it to landslide hazards, particularly during the rainy season.

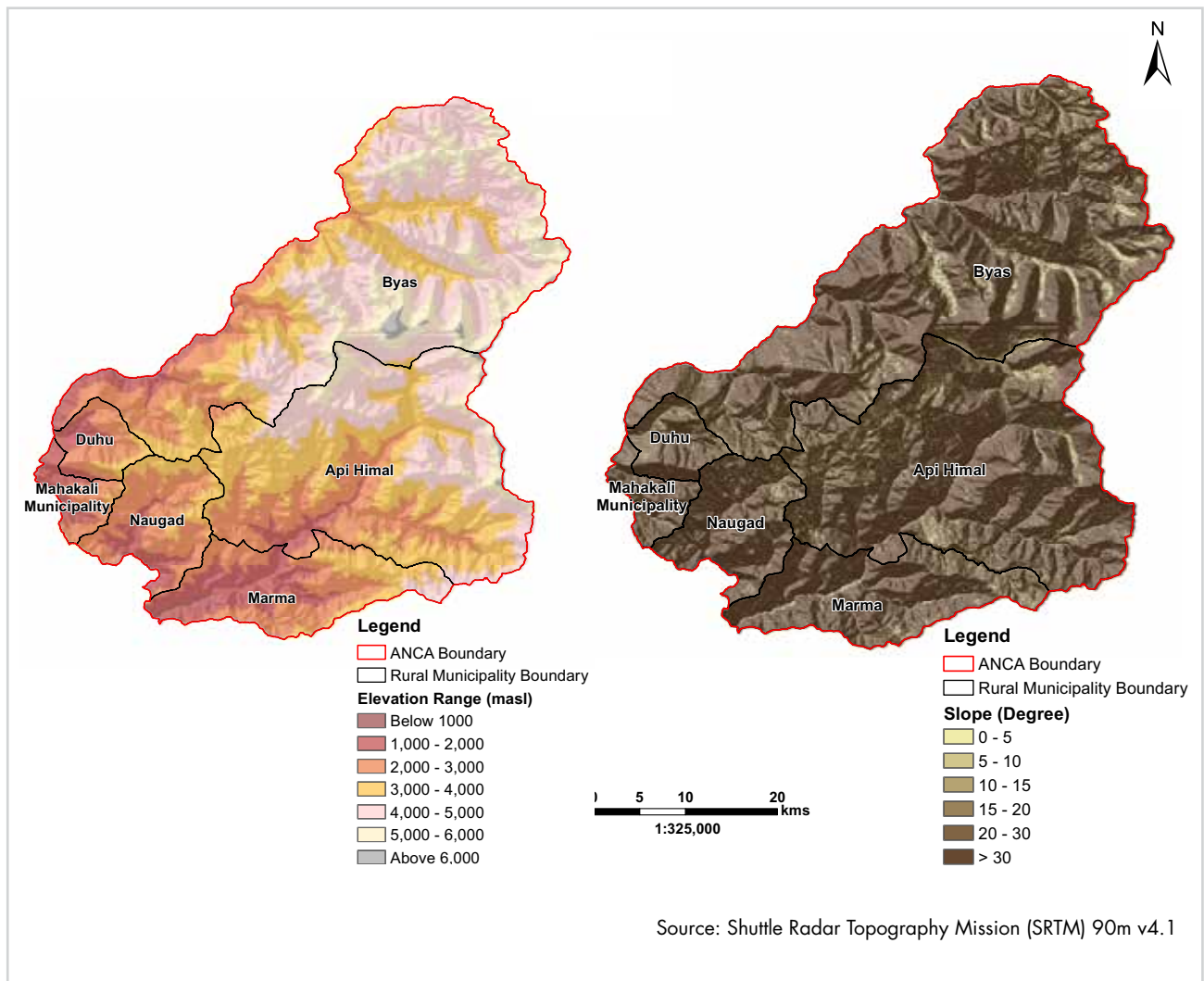


Figure 2.1: Elevation map (left) and slope map (right) of ANCA

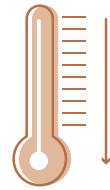
2.3. Soils

The soils found in ANCA are generally very young in the early stages of development having little or no diagnostic horizons (Cambisols, Leptosols and Regosols) (Figure 2.2). In the floodplain areas and at lower elevations, alluvial soils of fine or coarse loam can be found. In the mid-hills, the soils have a higher proportion of calcareous clay minerals. In the higher elevations and on steep terrain, the soils are shallow and have high gravel content (Gelic Leptosols).

2.4. Climate

The varied topography and elevation differences in ANCA results in climatic variations within the area. Sites up to 1,200 masl are influenced by the Subtropical monsoon climate; Cool temperate climate affects places between 1,200 and 2,700 masl; up to 4,700 masl, the Alpine climate is prevalent; while places above 4,700

masl experience the Arctic climate (DNPWC 2017a). The average minimum and maximum temperature recorded were 13.69 °C and 27.78 °C, respectively (DNPWC 2017a). The average annual precipitation was 209.4 mm, with the highest rainfall occurring during the months of July and August and the lowest from November to April.



Average minimum temperature 13.69 °C

Average maximum temperature 27.78 °C

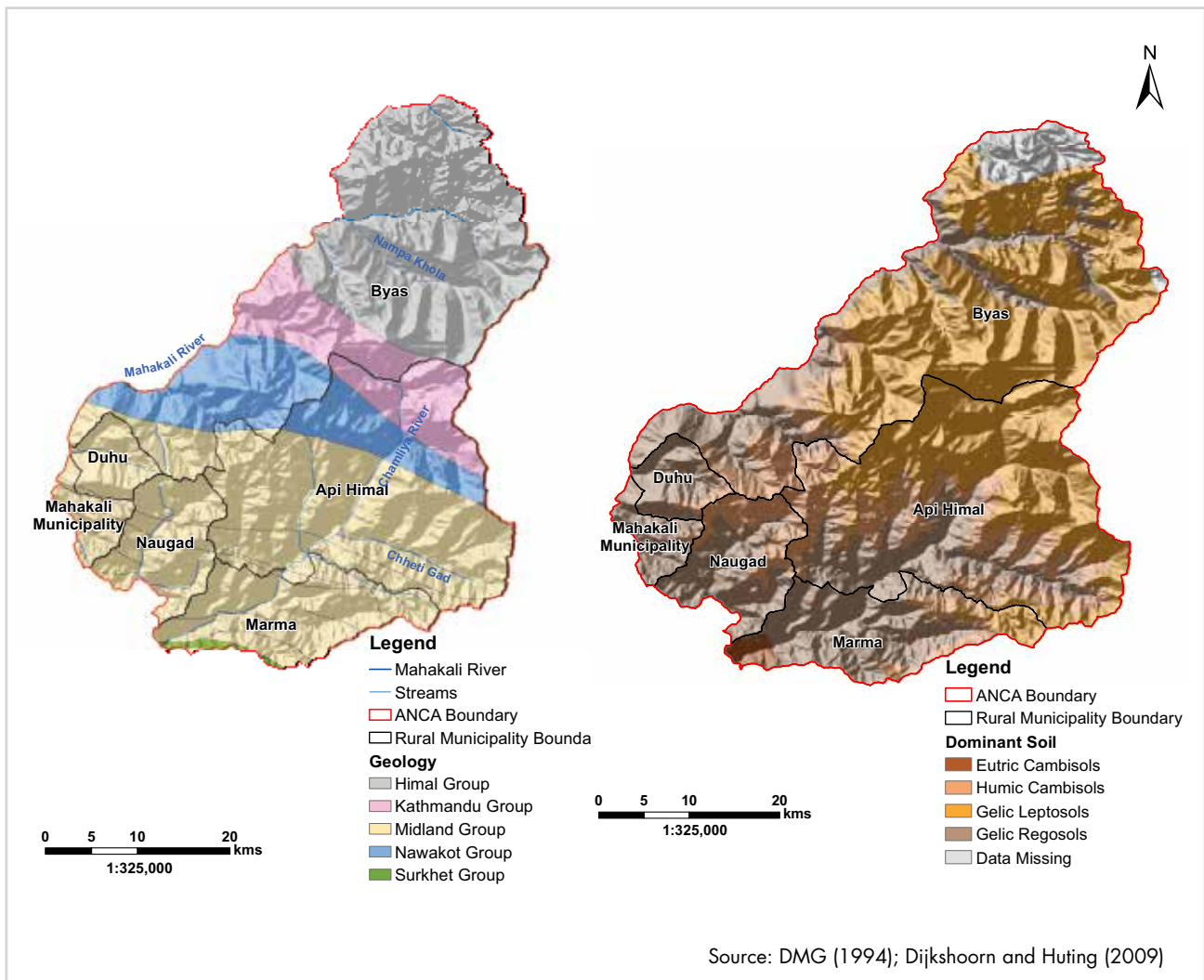


Figure 2.2: Geology (left) and soils (right) of ANCA

2.5. Drainage and river system

There are two major rivers draining ANCA: Mahakali and Chameliya (Figure 2.3). The Mahakali (known as Kali Gad or Kali Ganga in India) is a perennial river and is also the western-most boundary of Nepal with India. The Chameliya (or Chamelia), also known as Chaulani, has its headwaters in the glaciers at the southern slopes of Mt Api and ultimately joins the Mahakali River at the south-western portion of Darchula District. Other rivers

in ANCA include Tinker Khola, Tusharpani Khola, Kala Gad, Nau Gad, Thali Gad, Lasku Gad, Kankara Gad, Nijang Gad, Agar Gad, Tan Nava, Lani and Bhele.

Glaciers occur at higher elevations in ANCA (Figure 2.3) and occupy almost 6 per cent of the total area. These glaciers are generally debris-covered ones and their meltwaters contribute to many rivers, including the Mahakali and Chameliya.

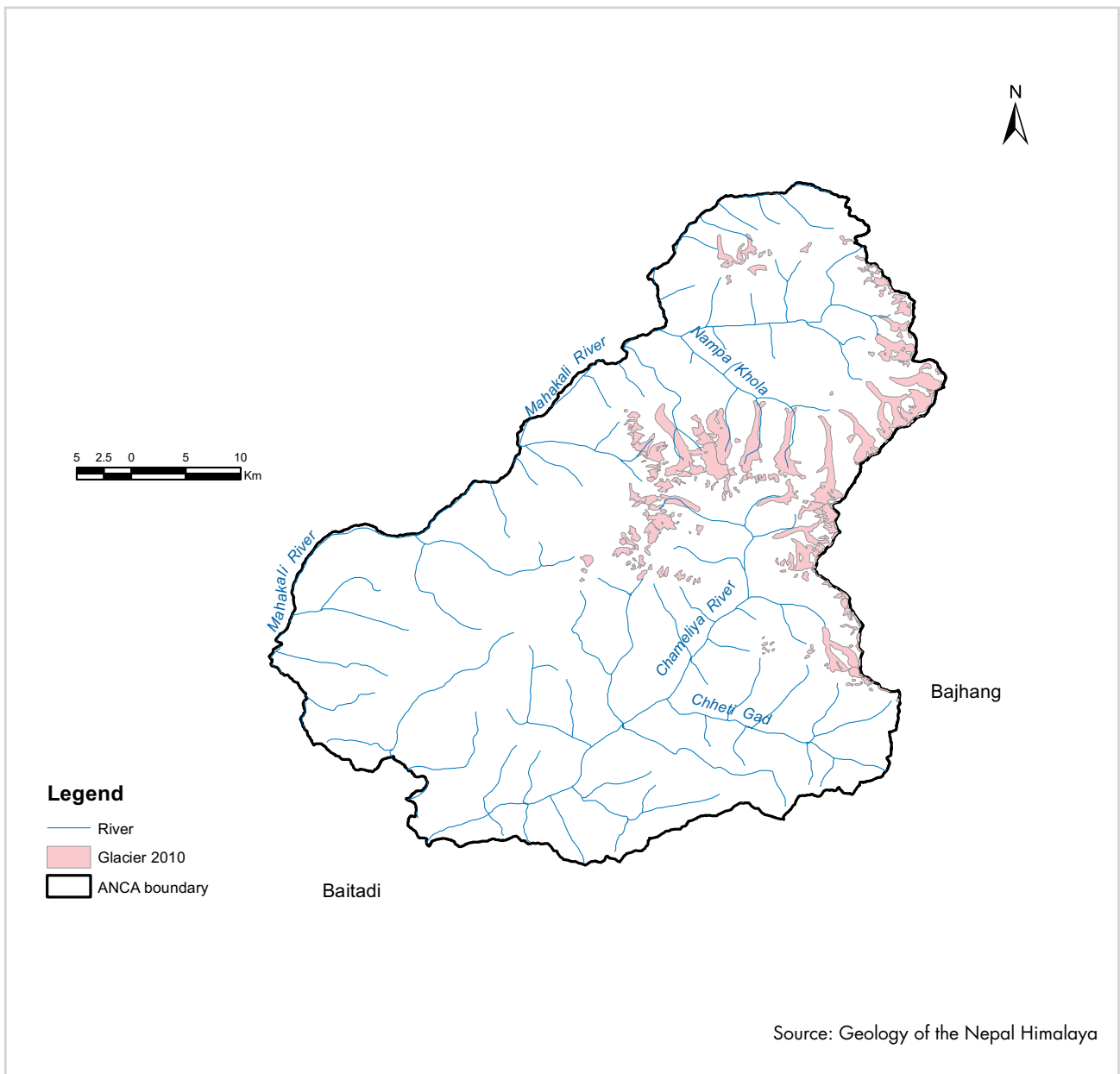


Figure 2.3: Drainage pattern and glaciers in ANCA



Photo 2.1: Terrace farming is common in ANCA (Credit: Jitendra Bajracharya)

2.6. Land use and land cover

A little more than one-third of ANCA is covered by forests and a little over a quarter by grasslands and scrub (Figure 2.4, Table 2.1). Snow and glaciers, which are mostly found in the north-eastern parts of

ANCA, encompass almost 20 per cent of the total area. Agricultural lands, most of which are terraced into moderately or steeply sloped areas, are nominal at 4.9 percent.

Table 2.1 Proportion of area under different land-use categories in ANCA

Land use	Area (%)
Forest	37.486
Snow and glaciers	19.715
Grassland	15.487
Scrub	11.289
Rock and barren land	11.078
Agriculture	4.892
Water bodies	0.005
Settlement	0.003
TOTAL	100

Source: ICIMOD (unpublished report)

2.7. Biomes

ANCA is dominated by forest and grassland biomes. Within these two biomes, the Western Himalayan Alpine Shrub and Meadows features prominently by occupying more than half of the total area of ANCA (Figure 2.4). The Western Himalayan Subalpine Conifer Forest and the Western Himalayan Broadleaf Forest occupy almost one-third and a little more than 10 per cent of the total area, respectively. The Himalayan Subtropical Pine Forest ecoregion, consisting mostly of chir pine (*Pinus*



Western Himalayan Alpine Shrub and Meadows occupies more than half of the total area of ANCA

roxburghii) forests, occupies a small proportion of the area (4 per cent) towards the southern portion of ANCA.

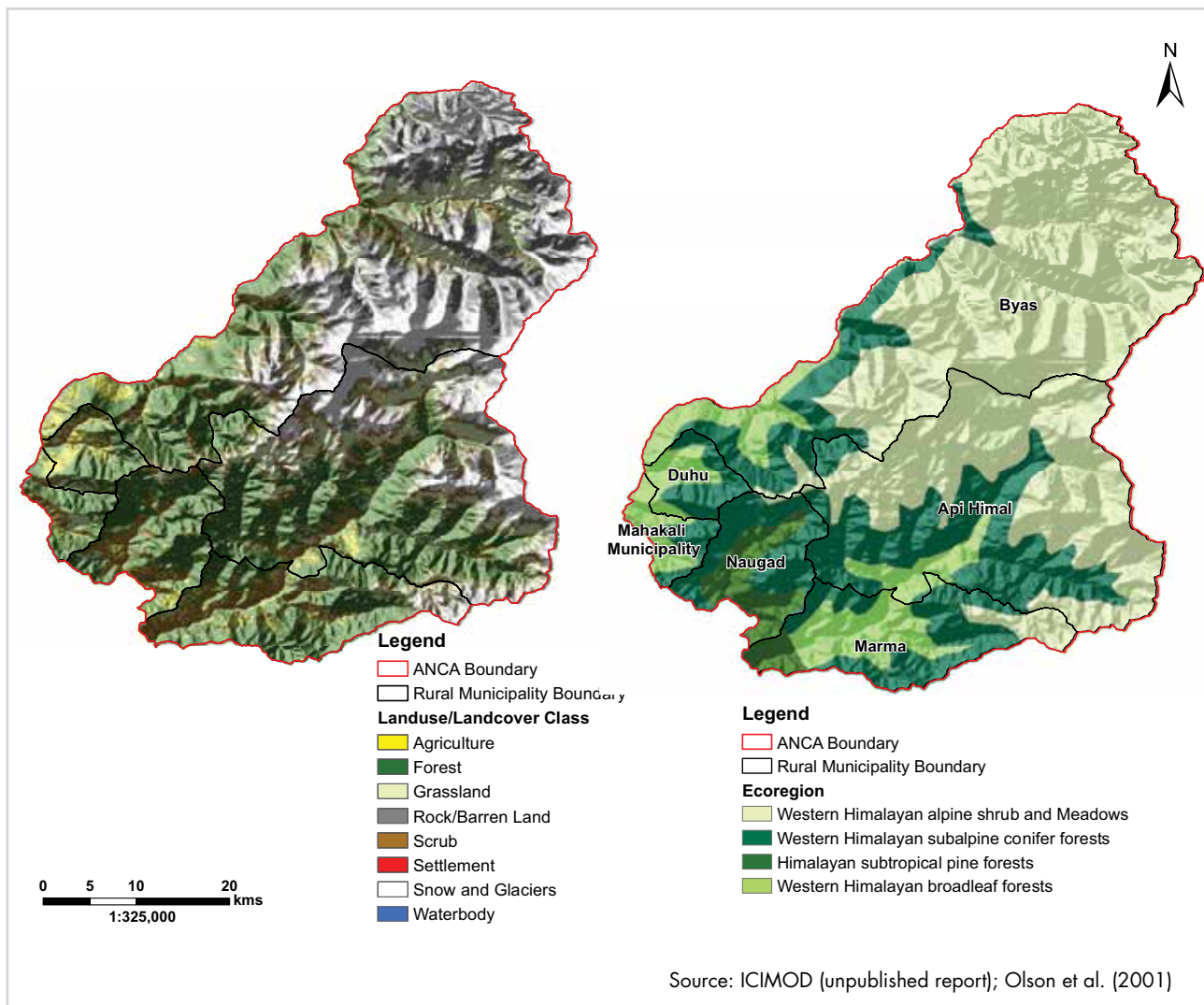


Figure 2.4: Patterns of land use, land cover(left) and ecoregions (right)



Photo 3.1 : Subsistence agriculture is a major livelihood strategy (Credit: Jitendra Bajracharya)

3. Socio-economic Profile

3.1 Demography

In 2017, the Government of Nepal (GoN) delineated new administrative units throughout the country. Formerly consisting of 21 Village Development Committees (VDCs) in Darchula District, ANCA is now restructured into three Rural Municipalities (RMs)—Api Himal, Byas and Marma; parts of two RMs—Duhu and Naugad; and one Municipality—Mahakali (Annex 1).

The population of ANCA (as per the household census of 2011) is 59,609, of which women comprise 52 per cent (CBS 2014). The population resides in 440 settlements across ANCA. The settlements located in the lower elevations of ANCA are more densely populated in comparison to the higher-elevation settlements (Figure 3.1). For example, Marma RM situated at the southern boundary of ANCA is the most densely

populated (4,675 persons), while Byas RM in the northern high mountain region of ANCA is sparsely populated (556 persons). In general, the population of ANCA is increasing every year. Relative to the previous census of 2001, the population increased by 8.8 per cent (CBS 2014).

There are 10,412 households in ANCA, with an average household size of 4.8 persons (CBS 2014). The average household size in ANCA is lower than the national average of 5.4 and the district average of 5.8. The number of households varies from the lowest of 174 in Byas RM to the highest of 787 in Marma RM.

The social groups of Chhetri, Brahmin, Thakuri and Dalit comprise a little over 98 per cent of the population of ANCA (CBS 2014). Chhetri are the

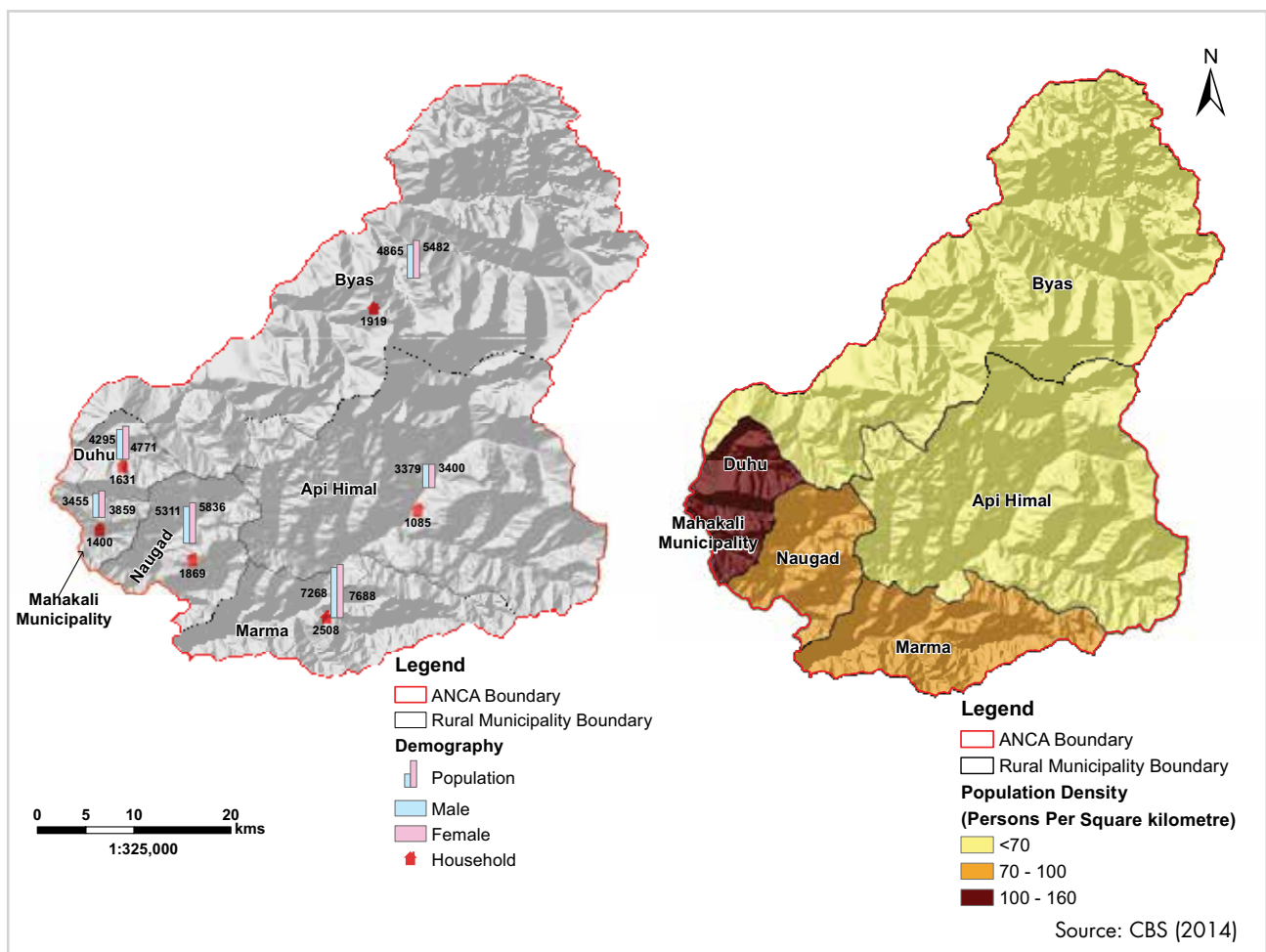


Figure 3.1: Demography (left) and population density (right)



Photo 3.2: Women comprise more than half the population in ANCA (Credit: Chandra K. Subedi)

dominant social group constituting almost 76 per cent of the population. Dalits, who form almost 9 per cent of the population, consist of Bishwokarma (including Kami, Tamata and Lohar), Damai/Dholi, Badi, Sarki and others. The ethnic groups form only 1.5 per cent of the population and consist of Shauka, Tamang and Magar. The Shauka community is unique to the upper valleys of the Mahakali River in far-west Nepal and Pithoragarh, India. In Nepal, they reside primarily in the northern high-elevation region of Byas. Traditionally, the economy of the Shauka community has been based upon a combination of trans-Himalayan trade and agro-pastoralism.

3.2 Human development

The Human Development Index (HDI) for Darchula District (at 0.44) is lower than the national average (at 0.49) (NPC and UNDP 2014). Life expectancy is 69.05 years (higher than the national average of 68.80 years) and adult literacy is 58.2 per cent (compared to the national average of 59.6). The annual per capita income at USD 627 is also lower than the national average of USD 1,160. With ANCA comprising a little over half the area of Darchula District, it can be inferred that the HDI of ANCA is also lower than the national average.

There is a vast difference between girls and boys in Darchula in relation to school enrolment and attendance. In 2011 (CBS 2014), 4,493 girls were not attending schools, while the number of boys not

attending school was almost half of that at 2,568. Generally, girls and boys attend primary school in mostly equal numbers; however, the gap widens as they get older and more girls drop out of school to either help with domestic work or to get married. Another reason for this gap is the lack of higher-secondary schools in many villages and the reluctance of families to send their daughters to schools away from home.

Hygiene and sanitation is a critical issue to the health of local communities and an important part of human development (UNDP 2006). Health standards are linked both to infrastructural conditions as well as to the awareness level among individual households and the community. In 2011, almost half the households in ANCA did not have toilet facilities. However, the GoN's target of meeting basic sanitation facilities throughout the country by 2017 (MoWSS 2010) has contributed to programmes that have made eight VDCs in ANCA open defecation free (ODF) areas.

Access to water is an important factor that contributes to both hygiene and sanitation, as well as to gender parity, as women and girls are generally involved in fetching water for household use (UNDP 2011). A majority of the households (85 per cent) in ANCA have access to tap or piped water for domestic use, while the remaining households depend on springs, wells and streams (CBS 2014).

Access to energy for cooking is another important factor contributing to overall health and gender parity, as

women are generally involved in collecting fuelwood (UNDP 2011). Almost all households (99 per cent) in ANCA continue to use fuelwood as their primary source of energy for cooking (CBS 2014). Only a few households (less than 1 per cent) use other sources such as kerosene, biogas, liquefied petroleum gas (LPG) and electricity.

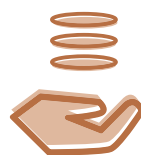
For rural communities in ANCA, road networks present a key element of infrastructure that can lead to social and economic prosperity. The national highway linking Kailali District in the lowlands to Tinkar Pass at the border of Nepal and China has been completed up to the district headquarters of Darchula at Khalanga. However, road construction beyond this point along the Mahakali River is happening at a slow pace. Moreover, the highway is often destroyed by landslides during the rainy season. Hence, the communities living along the Mahakali, especially those situated in the upper valleys of ANCA, continue to use transport facilities across the river in India.

3.3 Economic sector

Agriculture and livestock rearing are the major economic sectors in ANCA, with 98 per cent of the households engaged in these fields (CBS 2014). The major crops grown in the area are maize, paddy, millet, mustard, soybean and vegetables. Livestock such as cow, buffalo and goat are reared for both domestic purposes as well as for income generation through sales of their products. A very small proportion is involved in other economic sectors such as trade and business, transport or services.

Trade in NTFPs is a source of income for many people in ANCA (Pant et al. 2017). Twenty-eight species of NTFPs have been recorded as traded species from ANCA, notable among which are allo (*Girardinia diversifolia*), kutki (*Neopicrorhiza scrophulariiflora*), padamchal (*Rheum australe*), pakhanbed (*Bergenia ciliata*), rittha (*Sapindus mukorossi*) and tejpat (*Cinnamomum tamala*); these are traded in high quantities (DNPWC 2017a). Yartsa gunbu (*Ophiocordyceps sinensis*), a high-value–low-volume medicinal product, is an important NTFP that is harvested in the higher-elevation regions of ANCA.

Yartsa gunbu grows in alpine grasslands between 3,500 and 5,000 masl (Shrestha and Bawa 2013). Every year, between 10,000 to 30,000 collectors, including residents and non-residents of ANCA, gather in the alpine grasslands of Byas and Api Himal RMs to harvest yartsa gunbu between the months of April and July. It is the main source of cash income for many families



Annual per capita income in ANCA is USD 627 which is lower than the national average of USD 1,160



99% households in ANCA use fuelwood as their primary source of energy for cooking

in ANCA, as well as a significant source of revenue for the government, which currently charges a royalty at the rate of Rs 25,000 per kg of yartsa gunbu. The government regulates the amount of yartsa gunbu harvested every year—in 2016 the limit was 850 kg, while in 2017 it was 693 kg. Over the years, the amount of yartsa gunbu collected per person has been diminishing, while site degradation and social conflicts have been increasing (Pant et al. 2017). In this context, ANCA and the ANCA Management Council jointly developed local guidelines in 2016 to regulate and monitor the collection and trade in yartsa gunbu in the area. In 2017, the GoN directive on yartsa gunbu was endorsed and this national legislation now regulates yartsa gunbu collection in Nepal.

Human migration is an age-old phenomenon in Darchula District. Seasonal migration based on transhumance livelihoods has been practised by the Shauka community of Byas and Rapla. Although yartsa gunbu and other NTFPs provide a significant income for households, migration to India on a daily or seasonal basis is very common among the residents of Darchula District (Rabbani et al. 2016). However, in recent times and among the younger generation, migration for employment in other places, such as Malaysia and the Gulf countries, has become more prevalent. Moreover, the lack of good schools, health facilities, access to markets and transport compels either individuals or households to move to urban areas like Khalanga and Gokuleswor, or to send school-aged children to live with relatives in the urban areas. As indicated by Pathak et al. (2017) in the case of the Kumaon region in Uttarakhand (India), this outmigration from the high-mountain areas in ANCA is set to affect the socio-economic development of its remote settlements.



Photo 4.1 : *Primula macrophylla* is found at elevations from 3,400 to 5,600 masl (Credit: Jitendra Bajracharya)

4. Mountain Biodiversity

4.1 Vegetation and forest types

ANCA covers a diverse array of biomes, ecoregions and ecosystems. Mountain peaks, high-altitude pastures, forests, glaciers, rivers, lakes, cultivated lands and settlements are the prominent features in the area. A total of 14 vegetation classes have been identified in ANCA (Figure 4.1, Table 4.1). Forests occupy the largest area (37.5 per cent) in ANCA with six forest types identified (Table 4.1). Some tropical broadleaved forests are located at elevations below 1,000 masl, composed of sal (*Shorea robusta*). Between 1,000 and 1,800 masl, subtropical broadleaved (sal) and needleleaved forests (chir pine) are common, while montane broadleaved and montane needleleaved forests are found up to an elevation of 3,300 masl. Oak, rhododendron and lauraceous forests comprise the montane broadleaved evergreen forests, while alder, horse chestnut, maple and poplar are found in the montane broadleaved deciduous forests. The montane needleleaved forests are composed of cypress (*Cupressus torulosa*), hemlock (*Tsuga dumosa*) and East Himalayan fir (*Abies spectabilis*).

4.2 Rangelands

Alpine and subalpine rangelands occupy 26.8 per cent of the total area of ANCA and are found between 3,300 to 4,800 masl. These rangelands include scrub and grassland vegetation. Alpine scrub vegetation comprises black juniper (*Juniperus indica*) and dwarf rhododendron (*Rhododendron anthopogon*), as well as *Salix-Lonicera* association, while grassland (meadow) vegetation consists of a variety of herbs and grasses such as cinquefoils (*Potentilla sp.*), geranium (*Geranium sp.*) and sedge (*Kobresia nepalensis*) (Table 4.1). The alpine rangelands are used extensively for livestock grazing and for collection of fodder, wild foods and medicinal plants. Many high-altitude wildlife species, such as the snow leopard, blue sheep and goral, inhabit these rangelands.



37.5%
occupied by forests



26.8%
occupied by rangelands



1%
occupied by wetlands
which include rivers,
streams, and lakes

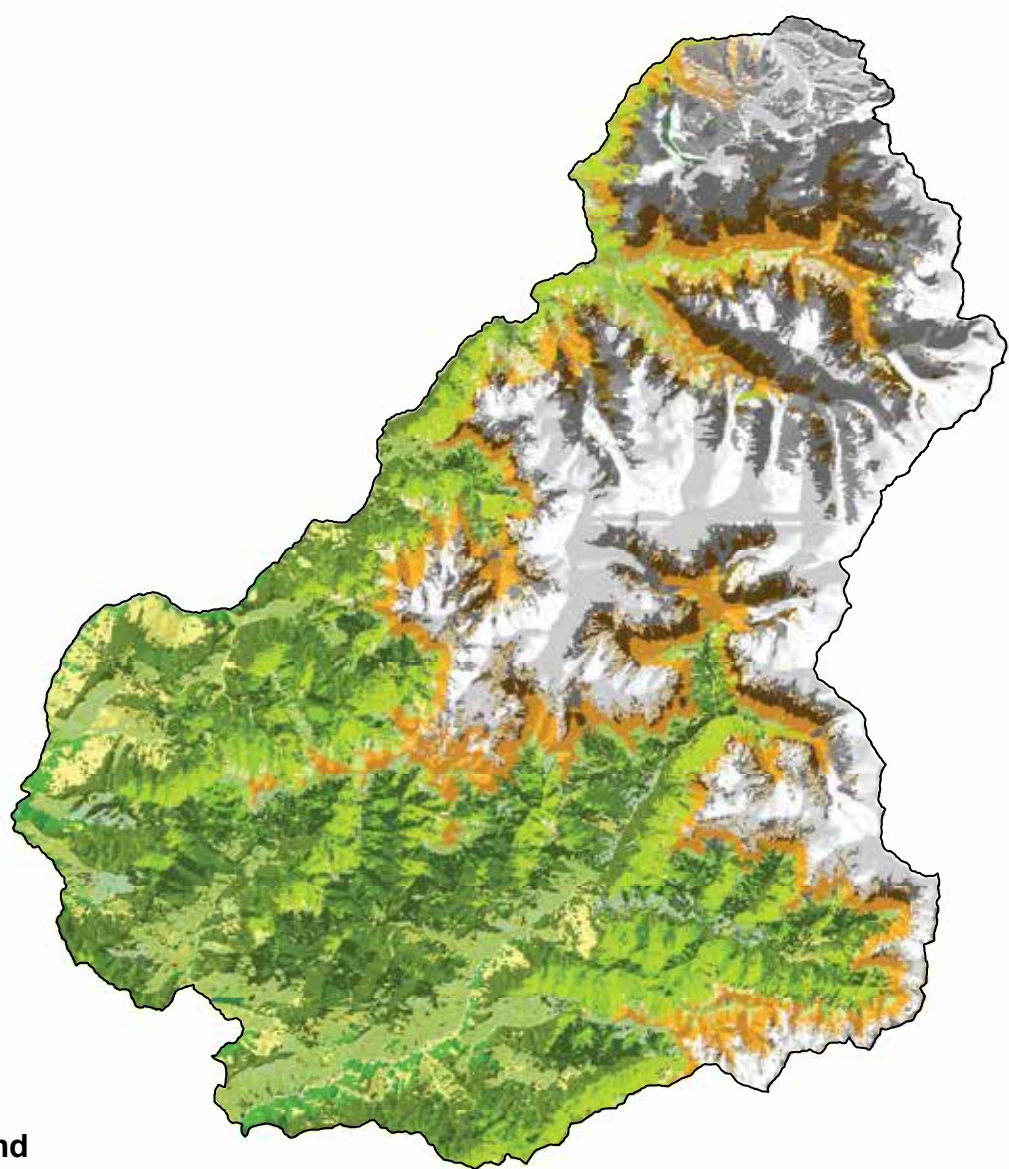
4.3 Wetlands

Wetlands, which include rivers, streams and lakes, occupy less than 1 per cent of the total area of ANCA. However, they provide habitat for many species of waterfowls, aquatic plants, invertebrates, fishes and amphibians. Some of the important wetlands in ANCA are Surma Sarobar Tal, Brahmdev Daha, Pasa Daha, Kotwalek Brahma Daha and Kali Dhunga Tal. These lakes are also important religious sites, especially for Hindus.

Table 4.1: Vegetation and forest types in ANCA

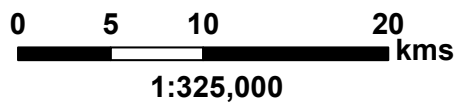
SN	Vegetation type	Broad communities	Characteristic species	Altitudinal range (masl)
1.	Tropical broadleaved forest	Sal forest	<i>Shorea robusta</i>	<1,000
2.	Subtropical broadleaved forest	Sal forest	<i>Shorea robusta</i>	1,000–1,400 (1,500)
		Toona forest	<i>Toona ciliata</i>	800–1,200
3.	Subtropical needleleaved forest	Chir pine forest	<i>Pinus roxburghii</i>	900–1,800
4.	Montane broadleaved evergreen forest	Banj (Oak) forest	<i>Quercus lanata, Myrica esculenta</i>	1,400–2,200
		Oak–Rhododendron	<i>Quercus lanata, Rhododendron arboreum</i>	
		Khasru (Oak) forest	<i>Quercus semecarpifolia</i>	2,600–3,300
		Oak–Lauraceous mixed forest	<i>Quercus lanata,, Neolitsea pallens</i>	1,500–2900
5.	Montane broadleaved deciduous forest	Himalayan horse chestnut forest	<i>Aesculus indica, Betula alnoides, Juglans regia</i>	1,800–2,400
		Alder forest	<i>Alnus nepalensis</i>	1,500–2,500
6.	Montane needleleaved forest	Cypress forest	<i>Cupressus torulosa</i>	1,800–2,400
		Hemlock forest	<i>Tsuga dumosa</i>	2,600–3,200
		East Himalayan fir forest	<i>Abies spectabilis</i>	2,400–3,300
7.	Secondary scrub	Mixed scrub, Lantana scrub	<i>Berberis asiatica, Prinsepia utilis, Rubus spp., Cocculus laurifolius, Pyracantha crenulata</i>	800–3,000
8.	Montane grassland	Grassland on steeper slope, Managed pasture	<i>Themeda anathera, Chrysopogon gryllus, Cymbopogon distans, Andropogon munroi</i>	Up to 3,300
9.	Subalpine forest	Birch–Rhododendron	<i>Betula utilis, Rhododendron campanulatum</i>	3,300–3,600
		Fir–Birch forest	<i>Abies spectabilis, Betula utilis</i>	
		Fir forest	<i>Abies spectabilis</i>	
		Maple mixed forest	<i>Acer sp.</i>	2,700–3,300
10.	Subalpine scrub	Krummholz	<i>Rhododendron campanulatum</i>	2,700–4,000
11.	Alpine moist scrub	<i>Salix</i> scrub	<i>Salix lindleyana</i>	3,300–3,800
		Rhododendron scrub	<i>Rhododendron anthopogon, Cassiope fastigiata, Cotoneaster microphyllus</i>	3,800–4,200
		Juniper scrub	<i>Juniperus indica</i>	
12.	Alpine dry scrub	<i>Caragana–Lonicera</i>	<i>Artemisia spp., Lonicera sp., Astragalus sp.</i>	3,400–5,000
		<i>Ephedra</i> scrub	<i>Ephedra gerardiana</i>	2,100–4,000
13.	Alpine moist meadow	Mixed herbaceous formation	<i>Potentilla sp., Geranium sp.</i>	3,400–4,500
		<i>Kobresia</i> meadow	<i>Kobresia nepalensis</i>	4,000–4,500
		Marsh meadow (peatland)	<i>Carex sp.</i>	
14.	Alpine steppe	(very rare in ANCA)		4,000–4,800

Source: ICIMOD (unpublished report)



Legend

- | | | |
|-------------------------|--------------------------------------|---------------------------------|
| ANCA boundary | Subalpine scrub | Subtropical broadleaved forest |
| Vegetation Class | Subalpine forest | Subtropical needleleaved forest |
| Alpine steppe | Montane grassland | Tropical broadleaved forest |
| Alpine dry scrub | Montane needleleaved forest | Snow and glacier |
| Alpine moist scrub | Montane broadleaved deciduous forest | Rock/barren land |
| Alpine moist meadow | Montane broadleaved evergreen forest | Agriculture |
| | Secondary scrub | Habitation |
| | | Waterbody |



Source: ICIMOD (unpublished report)

Figure 4.1: Vegetation classes in ANCA

4.4 Species diversity

4.4.1 Flora

Variations in temperature, elevation, aspects, geology and soils all combine to create a multitude of habitats for a wide variety of flowering plants, trees, ferns, mosses and lichens in ANCA. At least 535 species of angiosperm, 12 species of gymnosperm and 69 species of pteridophyte have been documented from ANCA (Table 4.2, Checklists 1, 2, 3). Among the angiosperm species, 10 are invasive alien plant species (IAPS) (Table 7.2). Of the many orchids found in ANCA, *Cephalanthera erecta* var. *oblanceolata* was recorded as a new species for Nepal (Subedi et al. 2018). Deodar (*Cedrus deodara*), typical of the western Himalayan vegetation type, is also found in ANCA. Meanwhile, fungi and lichens have not been adequately profiled (Checklist 4) and need further documentation.

Botanical explorations in Nepal have been recounted by several authors (Rajbhandari 1976 & 2016; Stearn 1978; Sutton 1978; Miehe et al. 2015). Rajbhandari (2016) gave a comprehensive account of botanical explorations in Nepal under three periods: Period I—early plant explorations between 1802 and 1947; Period II—active

plant exploration between 1948 and 1982; and Period III—recent explorations from 1983 onwards.

Plant exploration during Period I in west Nepal started with botanical explorers, mainly by individuals who entered across the Nepal–India border in the late 1800s. Early plant exploration in ANCA and the adjoining areas of KSL-Nepal (Kailash Sacred Landscape) was conducted by John Scully, a resident surgeon in 1876 in west Nepal in the Mahakali Valley and by J.F. Duthie, a British botanist who travelled from Garhwal to North Kumaon and west Nepal from 1884 to 1886. These were followed by several explorations: by Basant Lal Gupta and Bis Ram from the Forest Research Institute (FRI), Dehra Dun, India and Lall Dhwoj (a Nepalese representative) in the Mahakali Valley in 1929; by Khadananda Sharma from Nepal in Khaptad between 1932–37; by Frederick Marshman Bailey from the UK; and by Arnold Heim and Augusto Gansser from Switzerland in 1935–36. Based on their collections, some new taxa were described, notable among which are included in Table 4.3.

Table 4.2: Floral diversity in ANCA

SN	Category	No. of species	References
1.	Angiosperms	535	Elliott 2012; Ghimire 2015; Shrestha et al. 2018; Subedi et al. 2014; Subedi et al. 2016
2.	Gymnosperms	12	Ghimire 2015; Subedi et al. 2014; Subedi et al. 2016
3.	Pteridophytes	69	Jenkins et al. 2015; Ghimire 2015; Shrestha et al. 2018



Photo 4.2: ANCA is the western-most distribution for *Cephalanthera erecta* var. *oblanceolata* (Credit: Prabin Bhandari)

Table 4.3: Botanical explorations in ANCA (and western Nepal)

Year	Explorer (Country)	Areas/Places visited	Remarks on notable plant species, particularly those collected from ANCA
Period I—Early plant explorations between 1802–1947			
1876	John Scully (UK)	Mahakali Valley	J.D. Hooker described a new species of <i>Impatiens</i> and named it <i>Impatiens scullyi</i> .
1884–1986	J.F. Duthie (UK)	Darchula District, Nampa Gadh	Specimens preserved at the Forest Research Institute, Dehradun, India. Some new species collected from Nepal, including <i>Corydalis cashmeriana</i> , <i>Cyananthus cordifolius</i> , <i>Draba amoena</i> , <i>Sedum bouvieri</i> (now <i>Rhodiola himalensis</i> subsp. <i>bouvieri</i>).
1929	B.L. Gupta (India), Bis Ram (India), Lall Dhwoj (Nepal)	Mahakali Valley, Simikot, Khaptad, Silgarhi	Specimens preserved at the Forest Research Institute, Dehradun, India.
1932–1937	Khadananda Sharma (Nepal)	Khaptad, Dang and Doti areas	Specimens preserved at British Museum (Nat. Hist.), London.
1935–1936	F.M. Bailey (UK)	Simikot, Silgarhi and Jumla	British Museum (Nat. Hist.), London, and Royal Botanic Garden, Edinburgh. A new variety, <i>Berberis sikkimensis</i> var. <i>baileyi</i> , discovered.
1936	A. Heim and A. Gansser (Switzerland)	Tinkar Khola Valley (Darchula) and North-east Kumaon (India)	Specimens preserved at the University of Zurich (Switzerland). Vegetation of the Tinkar Khola Valley described (Schmidt 1938).
Period II—Active plant exploration between 1948–1982			
1952	O.V. Polunin, W.R. Sykes and L.H.J. Williams (UK)	Western Nepal, between Karnali and Kali Gandaki Rivers: Humla, Jumla, Mugu, Dolpo, Jajarkot and Salyan	Specimens preserved at British Museum (Nat. Hist.), London.
1953	J. Tyson, W.H. Murray and Bentley Beetham (UK)	Api, Nampa, Saipal, Chayngru and Tinkar in Bajhang, Baitadi and Doti	Specimens preserved at British Museum (Nat. Hist.), London. A new species, <i>Lagotis nepalensis</i> , (endemic to Nepal), was reported (Yamazaki 1971).
1954	J.E.M. Arnold with H.J. Harrington, J.J. Murray, I.F. Davidson and C.M. Todd (UK)	Bajhang (Saipal) and Baitadi	Specimens preserved at British Museum (Nat. Hist.), London.
1968–1984	J.F. Dobremez (France)	Dhangadhi to Api region	Vegetation map and herbarium collection.
1980	K.R. Rajbhandari (Nepal) with K.J. Malla and P.M. Regmi	Darchula and Baitadi Districts	Specimens preserved at the National Herbarium and Plant Laboratory (KATH), Nepal.

Period III—Recent explorations from 1983 onwards			
1984	M.A. Farille (Switzerland)	Kawa Lekh area (Darchula–Baitadi)	Specimens preserved at the Conservatoire et Jardin Botaniques de la ville de Genève, Switzerland.
2009	H. Ikeda (Japan) with C.A. Pendry and B.I. Dell (UK); M. Amano, S. Noshiro, T. Tanaka and N. Yamadoto (Japan); Y. Wang (China) and Nepali members	Darchula, Bajhang and Doti Districts	Specimens preserved at the University of Tokyo (Japan), Royal Botanic Garden (Edinburgh) and KATH (Nepal).
2012	H. Ikeda (Japan) with C.A. Pendry and A. Elliot (UK); K. Akai, S. Noshiro, N. Yamamoto, O. Yano and K. Yonekura (Japan)	Darchula and Api area	Specimens preserved at the University of Tokyo (Japan), Royal Botanic Garden (Edinburgh) and the National Herbarium (Nepal).
2013–2017*	DPR, CDB and RECAST through the KSLCDI	Darchula	Specimens preserved at KATH, Central Department of Botany (CDB) and RECAST. An orchid species, <i>Cephalanthera erecta</i> var. <i>oblanceolata</i> , reported as a new record for the flora of Nepal.
2013*	S.K. Ghimire (CDB, TU), C.K. Subedi (RECAST, TU) and N. Bhattarai (ICIMOD)	Chameliya Valley	Specimens preserved at CDB, TU.
2014*	S.K. Ghimire (CDB, TU), C.K. Subedi (RECAST, TU) and J. Gurung (ICIMOD)	Chameliya Valley	Specimens preserved at CDB, TU
2015–2016*	C.K. Subedi, K.M. Ghimire (RECAST, TU) and J. Gurung (ICIMOD)	Khar VDC	Specimens preserved at CDB, TU
2015–2016*	S.K. Ghimire (CDB, TU)	Chameliya Valley	Specimens preserved at CDB, TU

Source: Rajbhandari (2015) except for the dates denoted with *

Plant exploration in Period II—between 1948 and 1982—was carried out actively by several institutions from the UK and Japan. The British Museum (Natural History), UK and the Royal Horticultural Society, UK, jointly organized a botanical expedition in 1952 to west Nepal, led by Oleg Vladimir Polunin, William Russell Sykes and Leonard How John Williams, who explored the region between the Karnali and the Kali Gandaki Rivers. More than 60 new species were discovered during the expedition (Rajbhandari 2015).

The UK scientists John Tyson, W.H. Murray and Bentley Beetham collected botanical and entomological specimens from the Api–Nampa and adjoining areas in the Saipal and reached other parts of KSL-Nepal, including Baitadi, Bajhang and Doti. A new species,

Lagotis nepalensis, endemic to Nepal, was reported by Yamazaki in 1995.

Jean-Francois Dobremez, a French ecologist, explored almost all parts of Nepal between 1968 and 1984 and prepared vegetation maps of the country, including of the Dhangadhi-Api region, which covers the vegetation areas of KSL-Nepal. He also collected plant specimens which are mostly deposited in Grenoble, France.

Plant exploration in Period III from 1983 onwards has not been so active in the Api–Nampa region compared to other parts of Nepal. A small field trip was organized by M.A. Farille in the autumn of 1984 to collect plant species from the Kawa Lekh area (along Darchula–Baitadi Districts). After a gap of almost 25 years, Hiroshi

lkeda of the University of Tokyo led six expeditions for plant collection in Nepal from 2008–13. In 2009, the team, in collaboration with the Department of Plant Resources (DPR), visited Darchula, Bajhang and Doti Districts and in 2012, visited Darchula and ANCA areas of west Nepal. Between 2013 and 2017, extensive plant collections were made by the CDB, RECAST and DPR through the KSLCDI programme.

The western part of Nepal in general and ANCA in particular is rich in plant species; however, botanical expeditions here have been fragmentary. There is a need for national as well as joint transboundary botanical explorations to be undertaken for a comprehensive plant inventory of the region.

4.4.2 Fauna

Many species of mammals, birds, fish, amphibians, reptiles, butterflies and insects are found in ANCA (Table 4.4). Some charismatic mammal species include snow leopard (*Panthera uncia*), the Himalayan tahr

(*Hemitragus jemlahicus*) and blue sheep (*Pseudois nayaur*), which are found in the high mountains, and the Himalayan black bear (*Ursus thibetanus*) and the Himalayan musk deer (*Moschus chrysogaster*), which live in the mid-hills (Checklist 5). Colourful birds such as the Himalayan monal (*Lophophorus impejanus*) and satyr tragopan (*Tragopan satyra*) and birds of prey such as steppe eagle (*Aquila nipalensis*) and golden eagle (*Aquila chrysaetos*), as well as scavengers, including the house crow (*Corvus splendens*) and white-rumped vulture (*Gyps bengalensis*), are found here (Checklist 6) (BCN 2012). The rivers and lakes in ANCA also host numerous fish species such as the buche asla (*Schizothorax plagiostomus*) and sahar (*Tor tor*) (IEE 2008).

The diversity and the population status in ANCA of many faunal species are not known. There is a need to conduct such studies whereby new species are likely to be discovered. For example, two new species of insects, *Achaetomalachius kopetzi* (Constantin 2015) and *Laena weigeli* (Schawaller 2015), were found in ANCA (Checklist 7).

Table 4.4: Faunal diversity in ANCA

SN	Category	No. of species	References/Remarks
1.	Mammal	43	IEE, 2008; Aryal and Subedi 2011; Chalise 2011a; Chalise 2011b; Jnawali et al. 2011; Chalise 2012; Koju and Chalise 2013; Chalise 2013
2.	Bird	263	BCN 2012; Pravin 2014
3.	Fish	69	IEE 2008
4.	Insect	64 (at least)	Hartmann and Weipert (Eds) 2006, 2012, 2015



Photo 4.3: The Egyptian vulture is a globally threatened species (Credit: Mukesh Chalise)

4.4.3 Agrobiodiversity

Agrobiodiversity is important to ensure food and livelihood security among the communities in ANCA (Aryal et al. 2017). Local farmers generally practise subsistence farming and cultivate a number of local varieties of rice, millet, barley, wheat and beans (Table 4.5). However, some agricultural products, such as beans, walnuts and bay leaf, are traded in fairly large quantities from the area. Traditional knowledge is an important aspect of agrobiodiversity whereby age-old farming systems are continued through generations. Moreover, such knowledge is a key factor in conserving the local genetic resources. Various types of fruits and nuts are also grown in ANCA. Apples, peaches, guavas, citrus, hog plums and walnuts are grown for domestic purposes, as well as for sale in the local and regional markets.

4.5. Endemic species

The north-west part of western Nepal, i.e., the Kali-Karnali region comprising eight districts, including Darchula, has 101 endemic plant species (CDB 2010). Within ANCA alone, at least two endemic plant species are found: *Delphinium himalayai* Munz and *Scrophularia laportifolia* Yamazaki. Two species of endemic snails, *Vallonia costohimala* and *Vallonia himalaevia*, have been reported from the Baure Glacier Valley, south-west of Mt Nampa (Gerber and Bössneck 2009). Snails are generally considered very sensitive to climate change; hence, they could be an important indicator species for environmental changes in

ANCA. Additional assessments are likely to indicate the presence of other endemic species in the region.

4.6. Biodiversity hotspots

Four biodiversity hotspots were reported within ANCA based on the populations of globally and nationally threatened species found in the sites (Figure 4.2, Table 4.6) (IEE 2008). One biodiversity hotspot encompasses parts of Api Himal, Byas, Duhu and Naugad Rural Municipalities, where mixed pine, oak and rhododendron forests occur alongside numerous medicinal plants and wildlife. Within Eyarkot village of Naugad RM, another biodiversity hotspot is the area that includes Basdhara, Danphe and Siddanath community forests, which have a high density of medicinal plants such as lauth salla (*Taxus contorta*), chiraito (*Swertia chirayita*), pakhanbed (*Bergenia ciliata*) and timur (*Zanthoxylum armatum*). The third biodiversity hotspot is in Rani Kothha of Byas RM, where deodar (*Cedrus deodara*) forest is found. The fourth hotspot occurs in the Dharamghar area of Khandeshwori in Api Himal RM bordering the district of Bajhang. Here, mixed pine, oak and rhododendron forests with a high density of medicinal plants, along with wildlife, can be found. The wildlife found in the biodiversity hotspots include endangered and/or protected species such as the Himalayan monal, Himalayan black bear, snow leopard, Assam macaque and Himalayan musk deer. All of these biodiversity hotspots are priority areas where biodiversity conservation programmes must be implemented.

Table 4.5: Major agrobiodiversity in Khar, Naugad RM, ANCA

Crop	Local name	Varieties
Barley (<i>Hordeum vulgare</i> L.)	Jau	Jhuse, Mankare, Kalo, Seto, Thang jau
Beans (<i>Phaseolus vulgaris</i> L.)	Sotta	Seto local, Kalo local, Rato kirmire, Kaleji kirmire, Asali rajma, Marma, Temase, Bote, Kalo, Batule, Ankhe simi
Finger millet (<i>Eleusine coracana</i> Gaertn.)	Kodo	Nang kate, Kalo, Rato, Temase, Tiuli, Mutke, Kodekauli
Maize (<i>Zea mays</i> L.)	Ghoga/ Makai	Bhabari, Rato, Murali, Temase, Pahelo, Seto, Bhate, Ragese, Airkoti, Male, Baktado, Ghar, Baure, Marudi, Bikasi
Rice (<i>Oryza sativa</i> L.)	Dhaan	Khasare, Saali, Chamade, Takmaro, Roti, Chhoti, Jaili, Jumli, Kirmuli, Jau, Mangali, Rato
Wheat (<i>Triticum aestivum</i> L.)	Gahun	Dautkhane, Bhote, Rato, Thulo, Jhuse, Geru, Moto, Haasa, Lide, Jumli Bhoto, Nangri Bhoto

Source: Aryal et al. (2017)

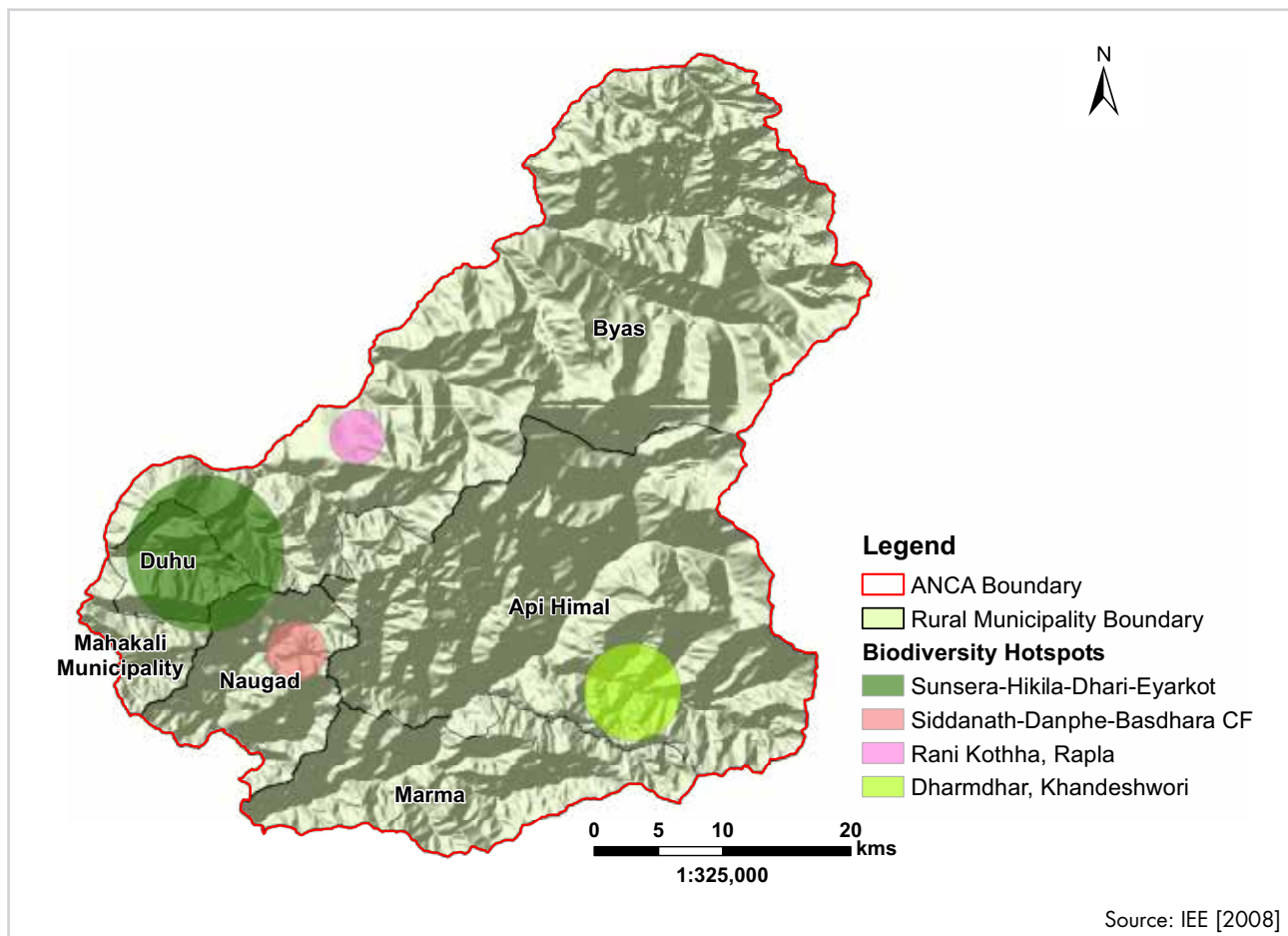


Figure 4.2: Biodiversity hotspots in ANCA

Table 4.6: Biodiversity hotspots in ANCA

SN	Area	Biodiversity elements		
		Forest species*	Medicinal plants*	Wildlife*
1.	Api Himal, Byas, Duhu and Naugad Rural Municipalities	Gobre salla (<i>Pinus wallichiana</i>), Khasru (<i>Quercus semecarpifolia</i>), Khote salla (<i>Pinus roxburghii</i>), Lali gurans (<i>Rhododendron arboreum</i>), Nigalo (<i>Drepanostachyum falcatum</i>)	Chiraito (<i>Swertia chirayita</i>), Kutki (<i>Neopicrorhiza scrophulariiflora</i>), Panchaule (<i>Dactylorhiza hatagirea</i>), Satuwa (<i>Paris polyphylla</i>), Sugandhawal (<i>Valeriana jatamansi</i>), Yartsa gunbu (<i>Ophiocordyceps sinensis</i>)	Bandel (<i>Sus scrofa</i>), Bhalu (<i>Ursus thibetanus</i>), Chituwa (<i>Panthera pardus</i>), Ghoral (<i>Naemorhedus goral</i>), Jarayo (<i>Rusa unicolor</i>), Jharal (<i>Hemitragus jemlahicus</i>), Kasturi mirga (<i>Moschus chrysogaster</i>), Ratuwa (<i>Muntiacus vaginalis</i>), Danphe (<i>Lophophorus impejanus</i>), Cheer (<i>Catrus wallichii</i>)
2.	Siddanath Community Forest (CF), Danphe CF and Basdhara CF of Naugad RM	Gobre salla, Kaulo (<i>Persea odoratissima</i>), Khasru, Okhar (<i>Juglans regia</i>), Lauth salla (<i>Taxus contorta</i>)	Chiraito, Kutki, Panchaule, Pakhanbed (<i>Bergenia ciliata</i>), Sugandhawal, Timur (<i>Zanthoxylum armatum</i>)	Bandar (<i>Macaca mulatta</i>), Chituwa, Ghoral, Jharal, Kasturi mirga, Naur (<i>Pseudois nayaur</i>), Ratuwa, Cheer, Danphe
3.	Rani Kothha, Byas RM	Bhojpatra (<i>Betula utilis</i>), Deodar (<i>Cedrus deodara</i>), Lauth salla	Timur	Bhalu, Chituwa, Kasturi mirga, Ratuwa
4.	Dharamghar in Api Himal RM (bordering Bajhang District)	Gobre salla, Khote salla, Khasru, Lali gurans, Lauth salla, Nigalo, Okhar, Paangar (<i>Aesculus indica</i>), Utis (<i>Alnus nepalensis</i>)	Chiraito, Kutki, Panchaule, Sankhdhar chuk (<i>Hippophae salicifolia</i>), Satuwa, Sugandhawal, Timur, Yartsa gunbu, Silajit	Bhalu, Chituwa, Ghoral, Jharal, Kasturi Mirga, Naur, Ratuwa

* Scientific names in parentheses

Source: IEE (2008)



Photo 5.1: Local people move to high-altitude rangelands during April and May for yartsa gunbu collection (Credit: Chandra K. Subedi)

5. Ecosystem Services

Ecosystem services are the wide ranges of benefits derived from different ecosystems (MEA 2005). They are categorized into four services: provisioning (products available from the ecosystems); regulating (benefits

derived from the ecosystem processes); cultural (spiritual and recreational benefits); and supportive (services necessary for production of other ecosystem services) (Table 5.1).

Table 5.1: Some ecosystem services in ANCA

Types of ecosystem services	Description
Provisioning services	
Food ¹	<i>Juglans regia</i> , <i>Phyllanthus emblica</i> , <i>Oryza sativa</i> , <i>Triticum aestivum</i> , <i>Zea mays</i>
Fodder	<i>Leucaena leucocephala</i> (introduced species), <i>Quercus semecarpifolia</i>
Fuelwood	<i>Aesculus sp.</i> , <i>Alnus nepalensis</i> , <i>Cinnamomum tamala</i> , <i>Ficus neriifolia</i> , <i>Juglans regia</i> , <i>Lyonia ovalifolia</i> , <i>Prunus cerasoides</i> , <i>Pyrus pashia</i> , <i>Rhododendron arboreum</i> , <i>Symplocos paniculata</i> , <i>Quercus lanata</i> , <i>Quercus semecarpifolia</i>
Fibre ²	<i>Girardinia diversifolia</i>
Timber	<i>Abies spectabilis</i> , <i>Alnus nepalensis</i> , <i>Juglans regia</i> , <i>Lyonia ovalifolia</i> , <i>Prunus cerasoides</i> , <i>Quercus lanata</i>
Medicine ^{2,3}	<i>Bergenia ciliata</i> , <i>Dactylorhiza hatagirea</i> , <i>Neopicrorhiza scrophulariiflora</i> , <i>Ophiocordyceps sinensis</i> , <i>Paris polyphylla</i> , <i>Swertia chirayita</i> , <i>Valeriana jatamansi</i> , <i>Zanthoxylum armatum</i> ,
Freshwater ^{4,5}	Snow and glaciers; water for drinking, irrigation, watermills, electricity generation
Minerals and soil ^{6,7,8}	Silajit, copper, gold, lead, zinc, uranium, red and white clay soil
Regulating services	
Carbon sequestration	Forests capture and store atmospheric carbon
Crop pollination ^{9,10}	Bees and insects pollinate plants in forests and agricultural land
Groundwater recharge	Rivers, springs and other wetlands purify water and control erosion and floods
Natural hazard regulation	Forests control soil erosion and landslides
Cultural services	
Spiritual and religious values	Temples: Lattinath Baba, Kedarnath, Durga and Devi temples
	Lakes: Bayali Tal, Kalidhunga Tal, Khatti Tal, Kali Daha
	Rivers: Domaule (confluence of Chameliya and Rakhop Rivers)
	Spiritual: Dhumi-Jhakri
	Springs: Chameliya spring
Aesthetic values	Api Himal, Api West, Bobaye, Jethi Bahurani and Nampa South peaks
Recreation and tourism ¹¹	Deuda and Bhuko dance; local costumes
Supporting services	
Habitat for wild animals	Habitat for protected wild animals, animal and plant species
Nutrient cycling ¹²	Water and nutrient cycle

Source: 1) Aryal et al. 2017; 2) Chaudhary et al. 2017; 3) Uprety et al. 2016; 4) DNPWC 2017a; 5) Dhital 2015; 6) Amatya 1994; 7) GC 2013; 8) Kaphle 2014; 9) Verma and Dulta 1986; 10) Partap and Verma 1994; 11) Manzardo et al. 1976; 12) Aponte et al. 2013

5.1 Provisioning services

The local communities of ANCA use numerous plant species from forest and rangeland ecosystems for timber, fuelwood, fodder, cattle bedding, food, grazing medicine, minerals and NTFPs. The fuelwood collected from the forests is the major source of energy for cooking and heating. Similarly, the local people collect different medicinal plants such as chiraito (*Swertia chirayita*), kutki (*Neopicrorhiza scrophulariiflora*), panchaule (*Dactylorhiza hatagirea*),

pakhanbed (*Bergenia ciliata*), satuwa (*Paris polyphylla*), sugandhawal (*Valeriana jatamansi*) and timur (*Zanthoxylum armatum*) from the forests and rangelands (Table 5.2) (Upriety et al. 2016). Moreover, the local people harvest allo (*Girardinia diversifolia*) from the forests to extract fibre for making ropes, bags and cloth. From April to July, they travel to the higher-elevation regions of Byas, Ghusa and Khandeshwori to collect yartsa gunbu.



Photo 5.2: Allo is collected from forests to produce fibre (Credit: Jitendra Bajracharya)



Photo 5.3: Traditional water mills are powered by streams and used for grinding grain (Credit: Jitendra Bajracharya)

Table 5.2: Major NTFPs in ANCA and their uses

SN	Scientific Name	Common Name	Nepali Name	Uses
1.	<i>Aconitum spicatum</i>	Aconite	Bish	Roots used for treating intestine and heart problems, fever, diarrhoea and cough. Plant extract is poisonous and used for hunting.
2.	<i>Acorus calamus</i>	Sweet root	Bojho	Roots effective against fever, cold and cough, dysentery, toothache, tonsillitis, skin diseases and mental disorders. Root powder used as natural insecticide.
3.	<i>Berberis aristata</i>	Barberry	Chutro	Bark used for treating diarrhoea, piles, jaundice and malaria and for making dye. Fruit used for making jam and brewing alcohol.
4.	<i>Bergenia ciliata</i>	Rockfoil	Pakhanbed	Rhizome effectively treats dysentery, diarrhoea, rheumatism, heart problems and sexual diseases and removes kidney stones.
5.	<i>Cinnamomum glanduliferum</i>	Nepal camphor tree	Sungandhakokila	Oil extracted from fruit used for making cosmetics, perfume and soap and also used for body massage. Pulp used for making scented incense sticks.
6.	<i>Dactylorhiza hatagirea</i>	Marsh orchid	Panchaule	Tubers and roots used for treating headache, cough, diabetes, dysentery and urinary problems. Cotton textile industry uses rhizome extracts to strengthen the fabric. Young leaves and rhizome are nutritious and are used as vegetables.
7.	<i>Delphinium himalayai</i>	Larkspur	Atis	Roots used for treating cough, diarrhoea, dysentery, headache, toothache and sexual problems.
8.	<i>Girardinia diversifolia</i>	Himalayan nettle	Allo	Leaves used for treating headache, tuberculosis, urinary problems and diabetes. Young leaves used as vegetable. Bark used for fibre to weave clothes, bags, ropes, etc.
9.	<i>Morchella conica</i>	Morel mushroom	Gucchy chyau	Plant useful for treating fever, sexual and digestive problems and for healing burn wounds.
10.	<i>Nardostachys jatamansi</i>	Spikenard	Jatamansi	Roots used for treating ulcer, dysentery, fever, cough, piles and lung diseases. Rhizomes used for treating fever, headache and altitude sickness. Rhizome oil used as hair tonic and for making cosmetics.
11.	<i>Neopicrorhiza scrophulariiflora</i>	Picrorhiza	Kutki	Rhizome used for treating high blood pressure, leprosy, anaemia, jaundice, cold and cough, back pain, constipation, lung and skin diseases.
12.	<i>Ophiocordyceps sinensis</i>	Caterpillar fungus	Yartsa gunbu	Strengthens immune system, lungs and kidneys; increases blood production; and treats sexual problems, tuberculosis, insomnia, indigestion and liver diseases.
13.	<i>Paris polyphylla</i>	Love apple	Satuwa	Used as an anthelmintic and tonic and also used for curing indigestion and cough and healing wound.
14.	<i>Persea odoratissima</i>	Fragrant bay tree	Kaulo	Bark used for making scented incenses. Leaves used as fodder.
15.	<i>Phyllanthus emblica</i>	Indian gooseberry	Amala	Fruits rich in Vitamin C and have religious values. Fruits used for treating constipation, dysentery, diarrhoea, asthma, measles and anaemia and for reducing stress. Fruits also used for making ink, hair oil, hair dye, shampoo and soap.
16.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i>	Insect gall in pistacia	Kaakarsingi	Used for treating scorpion and snake bites, lung and skin diseases, tuberculosis, ulcer, fever, cold and cough and dysentery.
17.	<i>Rubia manjith</i>	Indian madder	Majitho	Roots are astringent, expectorant and vulnerary. They are used for treating dysentery, leprosy, stomach ulcer and snake bites. Stems used for dyeing clothes.
18.	<i>Sapindus mukorossi</i>	Soapnut	Ritha	Fruits used for making shampoo, soap, detergent and fire extinguishers. Used for treating cough and epilepsy.
19.	<i>Swertia chirayita</i>	Felwort	Chiraito	Plant used for treating malaria fever, cold and cough, diabetes, skin diseases, nausea and vomiting, diarrhoea, jaundice, burn wounds; also for making beer, hair tonic and dye.
20.	<i>Taxus contorta</i>	Western Himalayan yew	Lauth salla	Extract (taxol) derived from young shoots, bark and leaves effective for treating breast, brain and womb cancers and tumours. Wood used as timber and to manufacture furniture.
21.	<i>Zanthoxylum armatum</i>	Nepalese pepper	Timur	Fruit used as spice and medicine and for making essential oil and natural insecticide. Also used for treating toothache, fever, gastritis, blood disorders, skin diseases and liver problems. Fruit and bark extracts used for fishing.

Source: Uprety et al. (2016)

Crops, such as cereals, pulses, vegetables, fruits and nuts and livestock production are major livelihood benefits generated from agro-ecosystems (Aryal et al. 2017). Seasonal transhumance migration—to higher elevations in the summer and to lower elevations in the winter—with sheep and goats is a traditional livelihood practice that helps communities cope with climatic variation and fodder scarcity (Chaudhary et al. 2017; Pant et al. 2017).

The glaciers in the mountains of ANCA are sources for many perennial rivers, including the Mahakali and Chameliya (Dhital 2015). In addition to these river systems, springs and ponds are important water sources for drinking, irrigation and other purposes. Streams are essential for operating traditional watermills to grind corn, wheat, rice, barley and millet. Larger streams and rivers are also important for generating hydroelectricity. In ANCA, there are 24 micro-hydropower stations that generate 432.9 kW of electricity, benefiting 4,701 households (DNPWC 2017a). The Chameliya Hydropower Project generates 30 MW of electricity and provides socio-economic benefits to communities both within and outside ANCA.

Rocks and minerals are important provisioning services derived from ANCA. Silajit, commonly known as rock exudate, is a mineral complex of organic and inorganic compounds and is used as a medicinal product. Copper, gold, lead, zinc and uranium are also reported to be present in the area (Amatya 1994; GC



24 micro-hydropower stations generate 432.9 KW of electricity benefiting 4,701 households

2013; Kaphle 2014). Slate is extracted to be used as a common roofing material, while white clay (kamero) and red clay (rato mato) soils are commonly used for both aesthetic (painting homes) and ritual (during prayer ceremonies) purposes.

5.2 Regulating services

Regulating services provide benefits at both local as well as regional scales. Some of these services include fresh air, carbon sequestration, natural hazard and climate regulation, crop pollination, groundwater recharge, water purification and disease regulation. About 33 per cent of ANCA is forest area, which sequesters carbon in plant tissues and soil. Consequently, it contributes to mitigating climate change. The vegetative cover also minimizes erosion and natural hazards such as floods and landslides.

Snow, rainwater, ponds, rivers and irrigation canals are essential systems for groundwater recharge. Vegetation cover improves groundwater recharge, which, in turn, plays a key role in maintaining and sustaining river flows,



Photo 5.4: Chameliya hydropower project generates 30 MW electricity (Credit: Pradyumna Rana)



Photo 5.5: Non-timber forest products are an important source of income (Credit: Chandra K. Subedi)

springs and other wetlands, as well as in purifying water. In addition, groundwater recharge also aids in reducing erosion and floods by absorbing the surface run-off.

Bees are effective pollinators that are essential for food production. The people here have been traditionally raising *Apis cerana*, honey-producing bees, which are important for producing good-quality seeds of vegetable crops, fruits and other plants (Verma and Dulta 1986; Partap and Verma 1994). Honey and honey-based products are used for their nutritional and therapeutic values (Rao et al. 2016).

5.3 Cultural services

The landscape and the wildlife of ANCA are major attractions and the area has several cultural and religious sites. The GoN now permits trekking by both Nepalis and foreigners in Api Himal, Api West, Bobaye, Jethi Bahurani and Nampa South peaks (DoT 2017). Another site of attraction is the Khatti View Point which offers spectacular views of Api Himal RM, while Mt Api, Bajhang District and Pithoragarh (India) can be seen from Bhujan in Naugad RM.

The Shauka people are a Tibeto-Burmese community (Hansson 1994) who originally inhabited Changru and Tinker in Byas. Today, they are also found in Sitaula, Khalanga, Dhuligada and Rapla. They have close affinity with Shauka communities living across the Mahakali River in India. Their animistic practices (Manzardo et al. 1976), customs and traditional dresses are tourist attractions. Other cultural attributes of ANCA are the Dhami-

Jhankri—a form of shamanism—Deuda and Bhuko dances, while the local costumes have a unique identity.

Some famous religious sites in ANCA are the Lattinath Baba, Kedarnath and Devi temples. The Bayali Tal (Lake), Kalidhunga Tal and Khatti Tal are considered sacred, along with the spring from where the Chameliya River originates at the base of Api Himal. Bishu-parva is a popular festival celebrated on the first day of Baisakh, which is also the first day of the New Year in the Nepali calendar. The communities also celebrate Surama Bhawani jatra (street festival) and Cheetti, Ghanjir and Gaura festivals. Some pilgrims visit ANCA on their way to the sacred Mt Kailash and Mansarovar Lake in the Tibet Autonomous Region (TAR), China.

5.4 Supporting services

Supporting services provide benefits indirectly or over a long period of time. Forest, rangeland and wetland ecosystems of ANCA are habitats for many species of plants and animals, including protected species such as the snow leopard and Himalayan musk deer and for economically significant species such as yarsa gunbu and satuwa. With its rich flora and fauna, nutrient cycling—the movement and exchange of chemicals and energy between the physical environment and living organisms—takes place efficiently in ANCA. Nutrients such as nitrogen and phosphorus are available to humans through interactions between plants, soil and organisms in the physical environment (Aponte et al. 2013). Those interactions influence the establishment, growth and reproduction of plant species in the region.



Photo 6.1 : Natural disasters can be aggravated by climate change (Credit: Jitendra Bajracharya)

6. Threats to Biodiversity

6.1 Threatened species

ANCA is home to a number of globally and nationally threatened flora and fauna (Table 6.1). At least one globally threatened plant has been found in ANCA—the critically endangered jatamansi (*Nardostachys grandiflora*) (Table 6.1)—while the gobre salla (*Abies spectabilis*) is near threatened. Three species are listed in CITES Appendix II—panchaule (*Dactylorhiza hatagirea*), jatamansi (*Nardostachys grandiflora*) and lauth salla (*Taxus contorta*). Ten plant species are protected under various categories by the GoN (Table 6.1).

Three globally threatened mammals—the Himalayan musk deer, snow leopard and the Himalayan black bear—and five birds—steppe eagle (*Aquila nipalensis*),

cheer pheasant (*Catreus wallichii*), white-rumped vulture (*Gyps bengalensis*), the Egyptian vulture (*Neophron percnopterus*) and red-headed vulture (*Sarcogyps calvus*)—are found in ANCA (Table 6.2). Nationally threatened mammals include Assam macaque (*Macaca assamensis*), the Himalayan musk deer, barking deer (*Muntiacus vaginalis*), common leopard (*Panthera pardus*), snow leopard, leopard cat (*Prionailurus bengalensis*) and Himalayan black bear. Thirteen nationally threatened bird species in ANCA include rusty-fronted barwing (*Actinodura egertoni*), cinerous vulture (*Aegypius monachus*), golden eagle (*Aquila chrysaetos*), steppe eagle, cheer pheasant, great parrotbill (*Conostoma oemodium*), grey-sided

Table 6.1: Threatened flora found in ANCA and their national protection status

SN	Scientific Name	Common Name (Nepali Name)	Family	Conservation Status		Legal Status	
				Global [†]	Nepal [†]	CITES	Nepal*
1	<i>Abies spectabilis</i>	East Himalayan fir (Talispatra)	Pinaceae	NT			II
2	<i>Dactylorhiza hatagirea</i>	Marsh orchid (Panchaule)	Orchidaceae		EN	II	II
3	<i>Juglans regia</i>	Walnut (Okhar)	Juglandaceae	LC			I, III**
4	<i>Nardostachys grandiflora</i>	Spikenard (Jatamansi)	Valerianaceae	CR	VU	II	II
5	<i>Neopicrorhiza scrophulariiflora</i>	Picrorhiza (Kutki)	Scrophulariaceae		VU		IV
6	<i>Shorea robusta</i>	Sal	Dipterocarpaceae	LC			III
7	<i>Taxus contorta</i>	Himalayan yew (Lauth salla)	Taxaceae	EN	EN	II	II
8	<i>Valeriana jatamansi</i>	Indian valerian (Sugandhawal)	Valerianaceae		VU		II
9	<i>Lycoperdon perlatum</i>	Puffball	Agaricaceae				II
10	<i>Thamnia vermicularis</i>	Lichens (Jhyau)	Ichmadophilaceae				II
11		Rock exudate (Silajit)					II

[†]CR: Critically Endangered; EN: Endangered; NT: Near Threatened; LC: Least Concern

*I: banned for collection, transportation and trade; II: banned for export outside the country without processing; III: banned for felling, transportation and export; IV: banned for export without identification and certification

***Juglans regia*: Category I—bark of *Juglans regia*.

Source: IUCN Red List (www.iucnredlist.org); Bhattarai et al. (2002); and DPR (2012)

laughingthrush (*Garrulax caerulatus*), bearded vulture (*Gypaetus barbatus*), white-rumped vulture, the Egyptian vulture, koklass pheasant (*Pucrasia macrolopha*), red-headed vulture and satyr tragopan (*Tragopan satyra*). Twelve mammals and eight birds are listed in CITES

Appendices I, II and III. Four mammal species and three bird species have been accorded priority protection under the National Parks and Wildlife Conservation Act 2029 (1973 AD).

Table 6.2: Threatened mammals and birds found in ANCA and their national protection status

SN	Scientific Name	Common Name	Family	Conservation Status		Legal Status	
				Global [†]	Nepal [†]	CITES	Nepal*
A) Mammals:							
1.	<i>Capricornis thar</i>	Himalayan serow	Bovidae	NT	DD	I	
2.	<i>Felis chaus</i>	Jungle cat	Felidae	LC	LC	II	
3.	<i>Hemitragus jemlahicus</i>	Himalayan tahr	Bovidae	NT	NT		
4.	<i>Lutra lutra</i>	Eurasian otter	Mustelidae	NT	NT	I	
5.	<i>Macaca mulatta</i>	Rhesus macaque	Cercopithecidae	LC	LC	II	
6.	<i>Macaca assamensis</i>	Assam macaque	Cercopithecidae	NT	VU	II	PP
7.	<i>Moschus chrysogaster</i>	Himalayan musk deer	Cervidae	EN	EN	I	PP
8.	<i>Muntiacus vaginalis</i>	Barking deer	Cervidae	LC	VU		
9.	<i>Mustela altaica</i>	Mountain weasel	Mustelidae	NT	DD		
10.	<i>Naemorhedus goral</i>	Common goral	Bovidae	NT	NT	I	
11.	<i>Panthera pardus</i>	Common leopard	Felidae	NT	VU	I	
12.	<i>Panthera uncia</i>	Snow leopard	Felidae	VU	EN	I	PP
13.	<i>Petaurista magnificus</i>	Hodgson's giant flying squirrel	Sciuridae	NT	DD		
14.	<i>Prionailurus bengalensis</i>	Leopard cat	Felidae	LC	VU	II	PP
15.	<i>Pseudois nayaur</i>	Blue sheep	Bovidae	LC	LC	III	
16.	<i>Ursus thibetanus</i>	Himalayan black bear	Ursidae	VU	EN	I	
17.	<i>Viverra zibetha</i>	Large Indian civet	Viverridae	NT	NT		
B) Birds:							
1.	<i>Actinodura egertoni</i>	Rusty-fronted barwing	Timaliidae	LC	EN		
2.	<i>Aegypius monachus</i>	Cinereous vulture	Accipitridae	NT	EN		
3.	<i>Aquila chrysaetos</i>	Golden eagle	Accipitridae	LC	VU		
4.	<i>Aquila nipalensis</i>	Steppe eagle	Accipitridae	EN	VU	II	
5.	<i>Catreus wallichii</i>	Cheer pheasant	Phasianidae	VU	EN	I	PP
6.	<i>Conostoma oemodium</i>	Great parrotbill	Sylviidae	LC	VU		
7.	<i>Cutia nipalensis</i>	Himalayan cutia	Sylviidae	LC	NT		
8.	<i>Garrulax caerulatus</i>	Grey-sided laughingthrush	Sylviidae	LC	VU		
9.	<i>Garrulax subunicolor</i>	Scaly laughingthrush	Sylviidae	LC	NT		
10.	<i>Gypaetus barbatus</i>	Bearded vulture	Accipitridae	NT	VU	II	
11.	<i>Gyps bengalensis</i>	White-rumped vulture	Accipitridae	CR	CR		
12.	<i>Haematospiza sipahi</i>	Scarlet finch	Fringillidae	LC	NT		
13.	<i>Lophophorus impejanus</i>	Himalayan monal	Phasianidae	LC	NT	I	PP
14.	<i>Mycerobas melanozanthos</i>	Spot-winged grosbeak	Fringillidae	LC	NT		
15.	<i>Neophron percnopterus</i>	Egyptian vulture	Accipitridae	EN	VU	II	
16.	<i>Niltava grandis</i>	Small niltava	Muscicapidae	LC	NT		
17.	<i>Phalacrocorax carbo</i>	Great cormorant	Phalacrocoracidae	LC	NT		
18.	<i>Pucrasia macrolopha</i>	Koklass pheasant	Phasianidae	LC	VU	III	
19.	<i>Sarcogyps calvus</i>	Red-headed vulture	Accipitridae	CR	EN	II	
20.	<i>Tragopan satyra</i>	Satyr tragopan	Phasianidae	NT	VU	III	PP

[†]CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient

*PP: Listed in Protected Species List under the National Parks and Wildlife Conservation Act 2029 (1973 AD)

Source: IUCN Red List (www.iucnredlist.org); Jnawali et al. (2011); Chalise (2013); HNS (2016a); Inskipp et al. (2017)

6.2 Drivers of forest change

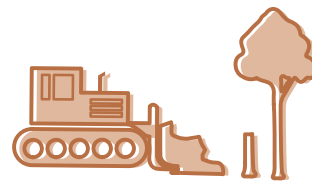
A number of factors cause deforestation, forest degradation and fragmentation in ANCA, resulting in habitat loss and/or isolation, which is ultimately a threat to biodiversity. Habitat fragmentation is particularly significant in the case of large animals such as the Himalayan black bear (Jnawali et al. 2011). A number of these drivers of forest change are indicated below.

Forest encroachment

Forest encroachment for agriculture or settlements is one of the drivers of forest change in ANCA (DNPWC 2017a). A growing population and inadequate agricultural land are two of the underlying issues in forest encroachment (MoFSC 2014).

Infrastructure

Road and hydroelectric projects are two important types of infrastructure that are being developed in ANCA. A national highway linking Kailali (in the lowland region of Nepal) to Tinkar Pass, Darchula, at the border with TAR-China, is a priority project of GoN (DoR 2016). In addition, feeder roads are under construction in



Infrastructure development destroys forest areas, which affects ecosystem services

various parts of ANCA. While these roads link formerly inaccessible villages to other villages and services, their construction requires the removal of a significant number of trees in the forested areas. The 30 MW Chameliya Hydropower Project is a large project whose dam and powerhouse are located outside ANCA at Bitule, but whose reservoir will submerge a fair amount of forested land within ANCA. Furthermore, the construction of the dam can potentially prevent movement of migrating fish species, although it is not known if the environmental impact assessment (EIA) of the project included these issues and their mitigation measures. Other infrastructure, such as schools, hospitals and buildings are also likely to cause deforestation and/or forest degradation.



Photo 6.2: Forest degradation is a threat to biodiversity (Credit: Jitendra Bajracharya)

Forest fires

The year 2016 was especially notable for the number of forest fires in far-west Nepal that destroyed several hectares of forests in both Nepal (HNS 2016b) as well as in Uttarakhand, India (Jha et al. 2016). Although the extent of losses incurred from these forest fires has currently not been scientifically documented, the fires have likely damaged both forest understorey and canopy, along with several faunal species living in these habitats. Prolonged drought and expansive, dry pine forests with thick litter layer are some of the factors that promote the proliferation of forest fires.

6.3 Unsustainable extraction of natural resources

Unregulated grazing

Overgrazing is a major issue threatening the biodiversity in ANCA, particularly in the northern and north-eastern rangelands of Byas RM (DNPWC 2017a). Alpine pastures in ANCA are especially susceptible to overgrazing and trampling (Elliot 2012). The overgrazing of livestock often leads to depletion of many useful species and dominance of bushes and non-palatable species (Aryal et al. 2014).



The year 2016 was especially notable for the number of forest fires in far-west Nepal and Uttarakhand, India

Illegal trade and poaching

Poaching and illegal trade of plants and wildlife pose severe threats to biodiversity conservation in ANCA (DNPWC 2017a). Several species of flora and fauna are illegally collected or poached and smuggled out of ANCA. Species such as the snow leopard, common leopard, Himalayan black bear and Himalayan musk deer, as well as yartsa gunbu and several medicinal and aromatic plants (MAPs) are threatened due to illegal trade. The northern parts of ANCA, i.e., Rapla and Byas, have been historically used as trade routes to TAR-China. Additionally, there are several ropeways over the Mahakali River connecting Nepal and India. While these are installed to transport essential goods and ferry people, they can also be potentially used to illegally transport wildlife parts and valuable NTFPs/MAPs.



Photo 6.3: Forest fires damage understorey as well as trees (Credit: Neha Bisht)

Overharvesting of NTFPs

ANCA is rich in NTFPs which have become a major source of livelihood for the local communities. However, the production of NTFPs is gradually decreasing due to unsustainable practices such as illegal and mass harvesting for local use and trade (Kunwar et al. 2013). Although the GoN policy aims to promote conservation of high-value NTFPs, particularly medicinal plants, sustainable harvesting practices for most NTFPs, including yartsa gunbu, kutki and satuwa have not been observed, causing a rapid decline in the natural resource base (Updtey et al 2016 Pant et al. 2017).

6.4 Human–wildlife conflict

Human–wildlife conflict (HWC) is a pressing issue in ANCA. The proximity of human settlements to forests and the degradation and fragmentation of wildlife habitat are some of the underlying factors that cause HWC. Livestock depredation by predators, such as snow leopard is common at higher elevations, while crop-raiding by wildlife such as the Himalayan black bear, wild boar, monkeys, barking deer and porcupines is common at lower elevations (IEE 2008; DNPWC 2017b). The local communities use traditional mitigation measures such as crop/livestock guarding and fencing, but these have had limited success. HWC is particularly detrimental to biodiversity when the victims resort to retaliatory killing. Such types of killing, especially of predator species, can cause severe imbalances in the ecosystem.

6.5 Invasive alien plant species

Invasive alien plant species (IAPS) are a major threat to biodiversity (SCBD 2009; WHO and SCBD 2015).

A field assessment conducted in 2015 revealed ten species of IAPS in ANCA (Table 6.3) (Bisht et al. 2016; Shrestha et al. 2018). Some of these IAPS have already resulted in negative impacts on agricultural production, forage production in rangelands and agroecosystems, livestock health and forest regeneration. IAPS were introduced by humans either purposely or by accident and they are spreading northward and upward through dispersal corridors such as roads, trails and springs. Since the management of IAPS is more challenging in the mountains than in the lowlands, reducing the abundance of IAPS in the lowlands and preventing their spread to the mountains are urgent tasks in ANCA.

6.6 Climate change

Biodiversity and ecosystem functions are directly linked to climatic conditions (Kumar 2012). Some potential impacts of climate change on biodiversity include the range shift of species from lower to higher elevations (GoN 2010), extinction of already vulnerable species that have restricted habitat requirements (GoN 2010) and replacement of plant–animal associations within ecosystems by native or non-native species (BCN and DNPWC 2011; MoPE 2017). The Global Observation Research Initiative in Alpine Environments (GLORIA) protocol, which is a long-term monitoring procedure, has been applied in ANCA to assess the impact of climate change on the alpine plant community structure (Ghimire 2015). The results of this long-term monitoring will provide insight into the impacts of climate change on alpine plant communities. However, additional studies are required to understand the effects of climate change on other aspects of biodiversity and ecosystem services in ANCA.

Table 6.3: Invasive alien plant species in ANCA

SN	Invasive Alien Plant Species	Common Name	Nepali Name
Major species			
1.	<i>Ageratina adenophora</i> L.	Crofton weed	Banmara, kalo banmara
2.	<i>Ageratum houstonianum</i> Mill.	Blue billygoat weed	Nilo gandhe
3.	<i>Erigeron karvinskianus</i> DC.	Karwinsky's fleabane	Phule jhar
4.	<i>Lantana camara</i> L.	Lantana	Kirne kanda
5.	<i>Parthenium hysterophorus</i> L.	Parthenium	Pati jhar
Other species			
6.	<i>Ageratum conyzoides</i> L.	Billy goat	Raunne/gandhe
7.	<i>Amaranthus spinosus</i> L.	Spiny pigweed	Kande lude
8.	<i>Bidens pilosa</i> L.	Black jack, hairy beggar-tick	Kalo kuro
9.	<i>Galinsoga quadriradiata</i> Ruiz & Pav.	Shaggy soldier	Jhuse chitlange
10.	<i>Xanthium strumarium</i> L.	Rough cocklebur	Bhende kuro

Source: Bisht et al. (2016); Shrestha et al. (2018)



Photo 7.1: Engaging local people supports biodiversity conservation (Credit: Jitendra Bajracharya)

7. Efforts, Achievements and Gaps in Biodiversity Conservation and Management

7.1 Efforts in biodiversity conservation and management

Enabling policies

Nepal is signatory to various international conventions and multilateral treaties and agreements relating to biodiversity conservation. To address national needs while complying with international commitments, the GoN has promulgated numerous sectoral and cross-sectoral policies, legislations and plans (MoFSC 2014). The National Parks and Wildlife Conservation (NPWC) Act (1973) laid the legal foundation for classifying any area into different types of protected areas. It also enabled the formulation of regulatory documents such as the Conservation Area Management Regulations, which are necessary for effective

implementation of the Act. These documents prioritize participation of local stakeholders through community institutions, such as Conservation Area/Buffer Zone Management and User Committees, Community forestry user groups, community-based anti-poaching units for protected area management. There are also special provisions for empowerment and participation of women and marginalized groups.

The National Biodiversity Strategy and Action Plan 2014–2020 underpins the effective participation of local communities and other stakeholders in biodiversity conservation to foster human well-being and sustainable development. Similarly, the Forest Policy (2015) calls for engagement of the private sector in habitat restoration and conservation for environmental sustainability and

Table 7.1: Relevant policies, legislations, guidelines, strategies and action plans

SN	Category	Details
1.	Policy	Rangeland Policy, 2010
2.		Climate Policy, 2011
3.		National Wetland Policy, 2012
4.		Forest Policy, 2015
5.		Forestry Sector Policy, 2016–2025
6.		National Forest Policy, 2019
7.	Legislation	National Parks and Wildlife Conservation Act, 1973
8.		National Parks and Wildlife Conservation Regulations, 1975
9.		Conservation Area Management Regulations, 1996
10.		Conservation Area (Government Managed) Regulations, 2000
11.		An Act to Regulate and Control International Trade in Endangered Wildlife and Plants, 2017
12.	Guidelines, Strategy, Action Plan	Conservation Area Management Guideline, 1999
13.		Physical Infrastructure Development inside Conservation Area, 2009
14.		Guidelines for Adventure Tourism Services in Conservation Areas in High Mountains and Mid-hills, 2067*
15.		Protected Area Research Procedure, 2069*
16.		Wildlife Damage Relief Guideline, 2069* (Second Amendment, 2074*)
17.		National Biodiversity Strategy and Action Plan 2014–2020
18.		Informant Mobilization Expense Procedure, 2072*
19.		Protected Area Management Plan Preparation Procedure, 2073*
20.		Vulture Conservation Action Plan for Nepal, 2015–2019
21.		Snow Leopard Conservation Action Plan for Nepal, 2017–2021
22.		Yartsa gunbu Management (Collection and Transportation) Directive, 2017

*Denotes year in Bikram Sambat

generating income and employment opportunities. Emphasis is placed on conducting research on the ecological and socio-economic aspects of biodiversity and disseminating the outcomes to promote improved technologies and practices. The following section highlights the key elements of the policies, legislations and plans relevant to ANCA (Table 7.1), which are broadly categorized under three themes—sustainable livelihoods, biodiversity conservation and gender and social inclusion.

Sustainable livelihoods

Acknowledging the dependency of communities on natural resources, the government transferred the forest management rights and responsibilities to local communities and permitted them to collect forest products in a regulated manner. Moreover, community-based tourism and biodiversity-based enterprises are promoted to enhance livelihoods of the communities and to incentivize communities towards conservation.



The Yartsa gunbu Management (Collection and Transportation) Directive (2017) guides the conservation, collection and utilization of yartsa gunbu

Biodiversity conservation

The NPWC Act 2029 (1973 AD) prohibits any activities deemed to threaten or cause damage to biodiversity. Four mammal species—Assam macaque, the Himalayan musk deer, snow leopard and leopard cat—found in ANCA are enlisted as protected fauna in Appendix I of the NPWCA. Action plans for key flagship species such as the snow leopard have been prepared for maintaining their viable population. In response to growing concerns over the unsustainable harvesting of yartsa gunbu, the Ministry of Forests and Soil Conservation (MoFSC) has recently published



Photo 7.2: Biodiversity-based enterprises enhance local livelihoods (Credit: Kamala Gurung)



Photo 7.3: Efforts are underway to ensure greater inclusion of women in conservation (Credit: Neha Bisht)

the Yarsagumba Management (Collection and Transportation) Directive (2017) to manage the harvesting practices of the medicinal plant in order to secure its sustainability.

The Conservation Area Management Regulations authorizes user committees and other stakeholders to manage resources sustainably following the prescriptions of a management/operational plan. The environmental code of conduct for adventure tourism, physical infrastructure and other livelihood programmes are promulgated for safeguarding nature. In order to mitigate HWC and gain public support for conservation, the government has provisioned relief schemes for those households affected by property loss or damage caused by wildlife.

The GoN has adopted the landscape planning approach for the management of forests, wildlife and watersheds (MoFSC 2014; MoFSC 2016). This approach aims at managing mosaics of different land uses in order to effectively integrate conservation and development at larger scales through a participatory method.

Gender and social inclusion

Inclusive decision making, equitable benefit sharing and transparent fund mobilization are priority issues of conservation policies as well as national development plans. The inclusion of women and marginalized groups are obligatory in key positions of different user committees formed for conserving biodiversity. In addition, the user groups must take mandatory affirmative action for improving the livelihoods of women and the poor and disadvantaged groups. Moreover, legislative documents have ensured the protection of the traditional rights of communities on biodiversity.

7.2 Key issues and opportunities in biodiversity management

Strengthening institutional and regulatory framework

Different policies supporting conservation, such as the National Wetland Policy (2012) and the Rangeland Policy (2010), have been devised in Nepal. Essential institutional framework and legislative instruments are required for implementation of these policies. The roles and responsibilities of the government agencies must be clarified in order to transform these policies and legislations into actions. Moreover, under the Conservation Area Government Management Regulations 2057 BS, the ANCA Management



Raising awareness among local communities on conservation legislation is essential.

Regulations must be promptly prepared or its effective management. Moreover, guidelines for harvesting different NTFPs (e.g. Ghimire and Nepal 2007) are also necessary to ensure the sustainability of the resources.

Existing legal documents do not adequately address the priority issues of the local communities. For instance, the Wildlife Damage Relief Guideline does not provide relief support for the crop damages caused by porcupines, wild boars and monkeys. On the other hand, capacities and measures need to be enhanced to effectively mitigate such conflicts.

The penalties for violating the law (for example, by engaging in wildlife crime and illegal trade) are soft and, coupled with weak law enforcement, has resulted in continued poaching and illegal wildlife trade in ANCA. The financial benefits from the sale of wildlife products are high, while the penalty incurred is low, hence people choose to take risks and engage in these illegal activities (Uprety et al. unpublished). To discourage illegal activities, Article 26 of the NPWC Act 2029 BS was amended in 2073 BS (Fifth Amendment), whereby the fines were increased for violating the law. ANCA is a trade route for wildlife products—such as rhino horns, tiger skin and bones, musk pod, red panda skin, turtles and yartsa gunbu—that originate both from within ANCA and other parts of Nepal (Uprety et al. unpublished).

Enforcing the law

There is a need to raise awareness among the local communities on conservation legislations in order to ensure effective law compliance and enforcement. The existing hierarchical structure within the community and the conventional protectionist approach for biodiversity conservation are major barriers for implementation of the regulatory provisions. This also affects inclusion of women and the disadvantaged groups in user committees, as well as equitable benefit sharing of resources (Kanel and Acharya 2008; Pasakhala et al. 2017). For instance, only 2 out of the 25 members in the ANCA Council are women.



Photo 7.4: Capacity building of women improves their livelihoods and increases support for conservation (Credit: Janita Gurung)

Nepal's rugged terrain and porous border with India and China are challenges for law enforcement. In 2012, the Wildlife Crime Control Bureau (WCCB) was formed in Darchula for fostering communication, coordination and cooperation among different government agencies. The capacity of the bureau needs to be strengthened for effective enforcement of the law. Furthermore, the ANCA Office, police and customs, among others, must strengthen coordination among themselves to control the illegal trafficking in wildlife.

Strict enforcement of the environmental code of conduct in infrastructure development and forest products collection is necessary to avoid ecosystem degradation in ANCA. Law enforcement and compliance, as well as the evaluation of the impacts of policies and programmes, must be regularly monitored. The findings and recommendations from such evaluations can help in the timely review and revision of legislation.

Capacity building of local institutions

Additional human and financial resources are required in ANCA for the effective implementation of policies and programmes. The existing infrastructure is rather limited and requires upgrading. The institutional capacity of both community organizations and governmental agencies must be strengthened.

Bridging the knowledge gap

Lack of data and research, particularly on biophysical and socio-economic factors, are hurdles in evidence-based decision making and achieving conservation and livelihood development goals. Inaccessibility and poor infrastructure increase the cost of conducting research in ANCA. Furthermore, research reports, data and other information resources are not readily accessible.

Mitigating conflict

There are conflicts relating to access and use of natural and financial resources in ANCA. There are conflicts in accessing the natural resources—such as yartsa gunbu and winter pastures—between the Shauka and non-Shauka communities (Pant et al. 2017). Additionally, multiple stakeholders with differing priorities contend to mobilize the limited budget of ANCA. Under the new federal structure of Nepal, the roles of the ANCA Council and the newly formed local governments, such as the RM and Municipality, are still unclear. The NPWC Act and other legislations must be duly revised to avoid conflicts between these institutions.



Photo 8.1: Documentation of local knowledge is essential for biodiversity conservation (Credit: Janita Gurung)



Photo 8.2: Research contributes to bridging the knowledge gap (Credit: ANCA Office)

8. Way Forward

The rich biodiversity of ANCA was the basis for its declaration as a Conservation Area in 2010. The ANCA Management Plan (2015–2019) guides the management of the protected area. The implementation of the plan holds the key to the conservation and sustainable use of biological resources as well as the enhancement of local livelihoods in the area. For implementing the plan, the GoN will must ensure the availability of the financial and human resources proposed in the plan. Partnerships with new institutions at local and provincial levels, along with the participation of relevant conservation organizations, are essential for effective implementation of the plan.

Capacity building of the Conservation Area institutions to improve their technical and managerial skills is a must. Moreover, raising awareness on the various aspects of biodiversity and its sustainable use (such as sustainable grazing and resource harvesting), as well as on the threats to biodiversity (such as addressing the issues of invasive alien species, forest fires and habitat loss) is crucial for long-term conservation and sustainable livelihoods. On the basis of the findings of this Biodiversity Profile, the following priorities have been identified.

8.1 Conservation priorities

Policy formulation/implementation

Formulation and implementation of policies and legislations relating to biodiversity conservation and its sustainable use is a conservation priority. National legislation to implement the recently ratified Nagoya Protocol is most essential. The effectiveness of policy implementation must be regularly monitored to make the necessary amendments. Furthermore, there is an urgent need to prepare the ANCA Management Regulations as well as guidelines relating to the management of community forests and the sustainable harvesting of NTFPs/MAPs.

Biodiversity and cultural hotspots

The four biodiversity hotspots identified in ANCA host two nationally endangered wildlife species (the Himalayan musk deer and Himalayan black bear) in addition to several other species of wildlife, medicinal plants and economically valuable trees. However, the status of

these biodiversity hotspots is little known. Additional research in these areas is required. Other potential biodiversity hotspots based on the presence of flagship species, such as the snow leopard, must be identified and conserved.

In Nepal, the Shauka community has been traditionally residing only in Byas RM within ANCA. Not much is known about their unique cultural and socio-ecological interactions. The area is a potential cultural hotspot and requires documentation of indigenous knowledge and traditional practices, along with its social and ecological status.

Conservation extension and outreach

Raising awareness on issues pertaining to biodiversity management and its sustainable use can be achieved through conservation extension and outreach. This will also ensure community engagement, especially the youth, in biodiversity conservation. Extension and outreach can be achieved through several mechanisms including print material, audio-visual programs, street dramas and eco-clubs.

Addressing HWC

HWC can be detrimental to biodiversity conservation. The local communities incur severe economic losses through crop-raiding and livestock depredation by wildlife such as wild pigs and porcupines; therefore, these communities are less likely to support conservation activities. Mitigation measures and relief schemes are necessary for addressing the issues involved in HWC.

Private-sector engagement

Local communities in ANCA are highly dependent on NTFPs/MAPs for their livelihood. However, they have not been able to reap the benefits because of a lack of facilities and arrangements for value addition. The engagement of the private sector in further processing the raw products and packaging and marketing them can bring in additional economic benefits.

Building climate resilience

Climate change effects is likely to lessen the functioning of biodiversity and ecosystem services, thereby impacting the livelihoods of the people who depend on them for both household as well as commercial



Photo 8.3: Awareness raising supports biodiversity conservation (Credit: Corinna Wallrapp)

purposes. Hence, it is necessary to make “climate smart” action plans on matters such as species conservation and value-chain activities. For example, the recently prepared Snow Leopard Action Plan for the Eastern Himalaya is Nepal’s first climate-adaptive and integrated landscape-level management plan (MoFSC 2017). Value chains can also be made climate resilient by using the “climate proofing” tool (ICIMOD 2016).

Transboundary cooperation

The proximity of ANCA to India and China makes it a transit point for transboundary illegal trade of natural resources such as snow leopard pelt (RSS 2016) and yartsa gunbu (Deuba 2017). For controlling illegal trade and poaching, the capacity-building of staffs and youths at the grass-roots level and transboundary coordination and cooperation are essential. This includes conducting regular border meetings between the relevant government institutions from India and Nepal, such as the police, intelligence, customs, forest officials and the ANCA Office. This would forge a common understanding and agreement on joint interventions to address such illegal activities.

8.2 Knowledge-management priorities

Research priorities

In comparison to other protected areas, the volume of research conducted in ANCA is fairly low. Future research priorities could include the following: population census and habitat assessment of wildlife species, particularly of threatened and flagship species in ANCA; assessment of distribution and status of endemic species and NTFPs/MAPs; as well as assessment of other faunal and floral species, particularly reptiles, amphibians, insects, lichens and mosses. Special attention is required on assessing the impact of climate change on the biodiversity and ecosystem services in ANCA, as well as its effects on the livelihoods of the local communities. Another topic of interest is payment for ecosystem services, with due consideration given to upstream–downstream linkages.

Documentation, dissemination and database

Research documents must be made available to the stakeholders, including ANCA, DNPWC, and other researchers. A database should also be maintained so that planners and decision makers can incorporate scientific data in their planning process.

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Checklist of Flora and Fauna in the Api Nampa Conservation Area

A. Checklist of Flora

Checklist 1: Angiosperms

Checklist 2: Gymnosperms

Checklist 3: Pteridophytes

Checklist 4: Fungi and Lichens

B. Checklist of Fauna

Checklist 5: Mammals

Checklist 6: Birds

Checklist 7: Insects

Checklist 1: Angiosperms

SN	Family	Scientific Name	Nepali Name	Habit	Locality	Elevation (masl)		†Distribution in Nepal	References	Use Value	Parts Used
						ANCA	Nepal				
1.	Acanthaceae	<i>Barleria cristata</i> L.		Herb			200–2,000	WCE	1		
2.	Acanthaceae	<i>Dicliptera bupleuroides</i> Nees.	Kalo angeri	Herb	Khar	2,078–2,300	500–2,000	WCE	1, 3*		
3.	Acanthaceae	<i>Strobilanthes capitata</i> (Nees) T. Anderson		Herb	Khar, Sunchera,	1,800	200–2,000	WCE	4*, 5*		
4.	Acanthaceae	<i>Strobilanthes tomentosa</i> (Nees) J.R.I. Wood		Herb	Chamelia Valley	2,600–2,700	1,000–2,100	WC	3*		
5.	Acanthaceae	<i>Strobilanthes urticifolia</i> Wall. ex Kuntze		Herb	Chamelia Valley	2,100–2,600	1,900–2,500	WC	3*		
6.	Actinidiaceae	<i>Saurauia napaulensis</i> DC.	Gogin, Phokse	Tree	Chamelia Valley, Khar,	2,100–2,600	700–2,100	WCE	3*		
7.	Adoxaceae	<i>Viburnum cotinifolium</i> D. Don		Shrub	Khar, Simar	2,280–2,879	2,100–3,600	WC	1, 3, 4		
8.	Adoxaceae	<i>Viburnum erubescens</i> Wall.	Ganeulo	Tree	Khayakot, Khar	2,000–2,190	1,500–3,000	WCE	1, 3, 4		
9.	Adoxaceae	<i>Viburnum mullaha</i> Buch.-Ham. ex D. Don	Amichha	Tree	Khar	2,218	1,800–2700	WCE	3*, 4*		
10.	Amaranthaceae	<i>Achyranthes aspera</i> L.	Bipya kuro, Nankuro	Herb			100–2,900	WCE	1	Medicine	Root
11.	Amaranthaceae	<i>Achyranthes bidentata</i> Blume		Herb	Chamelia Valley	2,000–2,400	1,200–2,100	WCE	3*		
12.	Amaranthaceae	<i>Amaranthus blitum</i> L.		Herb	Chamelia Valley	2,300	300–2,800	WCE	3*		
13.	Amaranthaceae	<i>Amaranthus spinosus</i> L.		Herb	Khar	1,879	150–1,200	WCE	1, 5*		
14.	Amaranthaceae	<i>Cyathula tomentosa</i> (Roth) Moq.	Kapase kuro	Subshrub	Chamelia Valley	2,100–2,300	1,400–2,400	WCE	1, 3*		
15.	Amaryllidaceae	<i>Allium pratense</i> C.H. Wright		Herb	Chhet-Mechhra	2,400–4,500	2,400–4,500	WCE	2		
16.	Amaryllidaceae	<i>Allium przewalskianum</i> Regel		Herb	Gauchhali Ghol	3,900–4,800	3,900–4,200	WC	2		
17.	Anacardiaceae	<i>Brucea javanica</i> (L.) Merr.	Bhakimlo, Bhakindo	Tree		1,300–2,100	1,300–2,400	WCE	1	Food	Fruit
18.	Anacardiaceae	<i>Pistacia chinensis</i> Bunge	Kakandsingi	Tree			2,100	W	1		
19.	Anacardiaceae	<i>Toxicodendron wallichii</i> (Hook. f.) Kuntze	Bhamkilo	Tree	Chamelia Valley	2,000–2,400	300–2,800	WCE	3	Medicine	Bark, Fruit
20.	Apiaceae	<i>Bupleurum dalhousieanum</i> (C.B. Clarke) Koso-Pol.		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,700–4,800	2,600–3,600	WC	2		
21.	Apiaceae	<i>Bupleurum falcatum</i> L.		Herb	Chamelia Valley	2,200–3,300	1,500–3,800	WC	3		
22.	Apiaceae	<i>Centella asiatica</i> (L.) Urb.	Ghodtapre	Herb			500–2,100	WCE	1	Medicine	Whole plant

23.	Apiaceae	<i>Corita depressa</i> (D. Don) Norman	Bajari	Herb	Api Base, Kali Dhunga, Tadhapani	3,600–4,900	3,600–4,900	WCE	2	Medicine	Fruit
24.	Apiaceae	<i>Heracleum candicans</i> Wall. ex DC.		Herb	Kali Dhunga	2,200–3,900	2,200–3,800	WCE	2		
25.	Apiaceae	<i>Heracleum lallii</i> C. Norman		Herb	Chamelia Valley	3,100–3,600	3,000–4,200	WC	3*		
26.	Apiaceae	<i>Heracleum nepalense</i> D. Don	Chetare	Herb			1,800–3,700	WCE	2	Medicine	Whole plant, Flower
27.	Apiaceae	<i>Heracleum wallichii</i> DC.	Chetare	Herb	Chamelia Valley	2,700–4,100	3,600–4,100	CE	2, 3	Medicine	Root, Young stem
28.	Apiaceae	<i>Pleurosperrum angelicoides</i> (Wall. ex DC.) Benth. ex C.B. Clarke		Herb	Shiyela	3,480	2,500–4,000	WCE	3		
29.	Apiaceae	<i>Sanicula elata</i> Buch.-Ham. ex D. Don		Herb	Thin	2,390	1,600–3,500	WCE	5*		
30.	Apiaceae	<i>Selinum candollei</i> DC.		Herb	Chamelia Valley	2,984	3,000–3,800	WC	3		
31.	Apiaceae	<i>Selinum wallichianum</i> (DC.) Raizada & H.O. Saxena	Bhukesh	Herb	Chamelia Valley	2,600–4,200	2,700–4,800	WCE	2, 3*	Medicine	Whole plant
32.	Apiaceae	<i>Vicatia nepalensis</i> Klyukov		Herb	Darchula		2,800	W	5*		
33.	Apocynaceae	<i>Ceropegia pubescens</i> Wall.	Bansimi	Climbing herb	Khar	2,280	900–2,700	WCE	4*		
34.	Aquifoliaceae	<i>Ilex diplyrena</i> Wall.	Seto kharsu	Tree	Chamelia Valley, Khar	2,200–2,600	2,500–3,000	WCE	3*, 4*, 5		
35.	Aquifoliaceae	<i>Ilex excelsa</i> (Wall.) Hook. f.		Tree			600–2,100	WCE	4*		
36.	Araceae	<i>Arisaema concinnum</i> Schott		Herb	Chamelia Valley	2,200–2,900	1,600–2,400	WCE	4*		
37.	Araceae	<i>Arisaema flavum</i> (Forsk.) Schott	Kalo banko	Herb	Khar	2,230–2,280	2,400–3,800	WC	3, 4	Vegetable	Corm, Leaf
38.	Araceae	<i>Arisaema jacquemontii</i> Blume	Banko, Chari banko	Herb	Chire Dhunga, Gauchhali Ghol	2,700–4,300	2,700–4,000	WCE	2	Vegetable	Flower, Leaf, Corm
39.	Araceae	<i>Arisaema tortuosum</i> (Wall.) Schott	Gau banko	Herb	Chamelia Valley, Khar	2,700	1,300–2,900	WCE	3*, 4*	Vegetable	Flower, Leaf, Corm
40.	Araceae	<i>Colocasia fallax</i> Schott		Herb	Khayakot	2,100	400–2,000	WC	3*		
41.	Araliaceae	<i>Aralia cachemirica</i> Decne.		Herb	Khandeshwori-Kaufalgad	2,210	2,400–4,200	WCE	5*		
42.	Araliaceae	<i>Hedera nepalensis</i> K. Koch	Dudhelo	Climber	Khar, Tipulchyakti-Dopakhe	2,268–2,400	2,000–3,200	WCE	1, 3, 4, 5*		
43.	Aristolochiaceae	<i>Aristolochia saccata</i> Wall.	Bhangkapare	Climber	Khar	2,280	2,100	WC	4		
44.	Asparagaceae	<i>Asparagus racemosus</i> Willd.	Kurilo	Subshrub	Khar	2,080	600–2,100	WCE	4*	Medicine	Root

45.	Asparagaceae	<i>Maianthemum purpureum</i> (Wall.) LaFrankie	Herb	Chamelia Valley	2,800–3,400	2,600–4,200	WCE	3*	
46.	Asparagaceae	<i>Ophiopogon intermedius</i> D. Don	Herb	Khar	2,275–2,284	1,200–3,000	WCE	4	
47.	Asparagaceae	<i>Polygonatum cirrhifolium</i> (Wall.) Royle	Herb	Chamelia Valley	2,300–3,000	1,700–4,600	WCE	3	Medicine
48.	Asparagaceae	<i>Polygonatum hookeri</i> Baker	Herb		3,700	2,900–5,000	WCE	2	
49.	Asparagaceae	<i>Polygonatum verticillatum</i> (L.) All.	Herb	Chameliya Valley	2,800–3,400	2,400–4,700	WCE	3	
50.	Asteraceae	<i>Ageratina adenophora</i> (Spreng.) R.M. King & H. Rob.	Herb	Khar	900–2,312	850–2,200	WCE	1	Medicine
51.	Asteraceae	<i>Ageratum conyzoides</i> L.	Herb	Khayakot	2,000–2,200	200–2,000	WCE	1, 3	Medicine
52.	Asteraceae	<i>Ageratum houstonianum</i> Mill.	Herb	Khar		1,300	WC	1	
53.	Asteraceae	<i>Anaphalis busua</i> (Buch.-Ham.) DC.	Herb	Khar	1,000–2,100	1,500–2,900	WCE	1, 4	
54.	Asteraceae	<i>Anaphalis contorta</i> (D. Don) Hook. f.	Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	1,700–4,700	1,700–4,500	WCE	2, 4*	
55.	Asteraceae	<i>Anaphalis margaritacea</i> (L.) Benth. & Hook. f.	Herb	Mechra	3,600	1,800–3,100	WCE	5*	
56.	Asteraceae	<i>Anaphalis nepalensis</i> (Spreng.) Hand.-Mazz.	Herb	Chamelia Valley	3,200–3,800	3,200–4,500	WCE	2, 3	
57.	Asteraceae	<i>Anaphalis royleana</i> DC.	Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	1,200–4,200	1,200–4,200	WCE	2	
58.	Asteraceae	<i>Anaphalis triplinervis</i> (Sims) C.B. Clarke	Herb	Lower Dojam, Thin	2,300–2,900	1,800–3,300	WCE	1, 5	
59.	Asteraceae	<i>Anaphalis xylorhiza</i> Sch. Bip. ex Hook. f.	Herb	Api Base, Tadhapani	3,400–5,000	3,400–5,000	WE	2	
60.	Asteraceae	<i>Artemisia dubia</i> Wall. ex Besser	Subshrub	Chameliya Valley	2,200–3,200	1,200–3,400	WCE	3, 4*	
61.	Asteraceae	<i>Artemisia gmelinii</i> Weber ex Stechm.	Subshrub	Dandap, Thin	2,500–3,900	2,800–4,300	WC	3, 5*	Medicine
62.	Asteraceae	<i>Artemisia indica</i> Willd.	Subshrub	Khar	2,200	2,900–3,800	CE	4*	Medicine
63.	Asteraceae	<i>Aster diplostephioides</i> (DC.) Benth. ex C.B. Clarke	Herb	Chamelia Valley, Chire Dhunga, Gauchhali Ghol, Kali Dhunga, Nete	3,200–4,900	3,200–4,900	WCE	2, 3	
64.	Asteraceae	<i>Aster falconeri</i> (C.B. Clarke) Hutch.	Herb		2,700–3,800	3,700–4,300	WC	3	

65.	Asteraceae	<i>Aster flaccidus</i> Bunge		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	4,200–5,100	4,200–4,900	WCE	2	
66.	Asteraceae	<i>Aster himalaicus</i> C.B. Clarke		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	3,500–5,200	3,500–5,200	WCE	2	
67.	Asteraceae	<i>Aster sikkimensis</i> Hook. f.		Herb			2,400–3,100	WCE	1	
68.	Asteraceae	<i>Bidens bipinnata</i> L.		Herb		1,700–1,800	300	WCE	1, 5	
69.	Asteraceae	<i>Carpesium nepalense</i> Less.	Padke ghans	Herb	Chheti-Mechhra	2,840	1,900–3,900	WCE	5*	
70.	Asteraceae	<i>Cirsium falconeri</i> (Hook. f.) Petr.		Herb			3,000–4,300	WCE	1	
71.	Asteraceae	<i>Cirsium wallichii</i> DC.		Herb	Khayakot	2,000	2,200	WC	3*	
72.	Asteraceae	<i>Cremanthodium arnicoides</i> (DC. ex Royle) R.D. Good		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,100–4,900	3,100–4,900	WC	2	
73.	Asteraceae	<i>Cremanthodium ellisii</i> (Hook. f.) Kitam.		Herb			3,600–5,500	WE	2	
74.	Asteraceae	<i>Doronicum roylei</i> DC.		Herb	Chheti-Mechhra	3,120	2,900–4,600	WC	5*	
75.	Asteraceae	<i>Dubyaea hispida</i> (D. Don) DC.		Herb	Chamelia Valley	2,700–3,800	2,700–4,300	WCE	3	
76.	Asteraceae	<i>Duhaldea cappa</i> (Buch.-Ham. ex D. Don) Pruski & Anderb.		Herb			150–2,500	WCE	1	
77.	Asteraceae	<i>Erigeron karvinskianus</i> DC.	Phuley jhar	Herb	Khar	2,217	2,100	WCE	1, 4	
78.	Asteraceae	<i>Erigeron multiradiatus</i> (Lindl. ex DC.) Benth. ex C.B. Clarke		Herb	Tadhapani	2,600–4,600	2,600–4,400	WCE	2	
79.	Asteraceae	<i>Galinsoga quadriradiata</i> Ruiz & Pav.		Herb	Khar	2,306	1,400–1,700	WC	1	
80.	Asteraceae	<i>Gerbera nivea</i> (DC.) Sch. Bip.	Pati phul, Jhulo/ Panda	Herb	Kuntisau	2,800–4,500	2,800–4,500	WC	5*	Medicine Leaf
81.	Asteraceae	<i>Leibnitzia nepalensis</i> (Kunze) Kitam.		Herb	Khar	2,270	2,000–4,100	WCE	4	
82.	Asteraceae	<i>Leontopodium himalayanum</i> DC.		Herb	Api Base, Mechhra- Kalagad	3,900–5,500	3,000–5,500	WCE	2, 5*	
83.	Asteraceae	<i>Ligularia amplexicaulis</i> DC.		Herb	Chamelia Valley	3,000–3,600	2,900–3,000	WCE	3*	
84.	Asteraceae	<i>Ligularia fischeri</i> (Ledeb.) Turcz.		Herb	Chheti-Mechhra	3,200–3,300	2,200–4,600	WCE	5*	
85.	Asteraceae	<i>Myriactis nepalensis</i> Less.	Ankale	Herb	Mechhra-Kalagad, Chamelia Valley	2,400–3,500	1,400–3,900	WCE	1, 3, 4, 5*	
86.	Asteraceae	<i>Parasenecio chenopodiifolius</i> (DC.) Grierson		Herb	Chamelia Valley	3,300–3,700	2,100–3,500	W	3	
87.	Asteraceae	<i>Parthenium hysterophorus</i> L.	Pati jhar	Herb	Khar		600	C	1	
88.	Asteraceae	<i>Prenanthes brunoniana</i> Wall. ex DC.		Herb	Chamelia Valley	2,400–3,300	2,300–3,800	WC	3	

89.	Asteraceae	<i>Pseudognaphalium adnatum</i> (DC.) Y.S. Chen		Herb				800-3,200	WCE	1, 5		
90.	Asteraceae	<i>Pseudognaphalium affine</i> (D. Don) Anderb.		Herb				600-3,700	WCE	1		
91.	Asteraceae	<i>Pseudognaphalium hypoleucum</i> (DC.) Hilliard & B.L. Burtt		Herb	Chhangru	2,900-3,300		2,500-2900	W	5*		
92.	Asteraceae	<i>Saussurea eriostemon</i> Wall. ex C.B. Clarke		Herb				3,900	W	2		
93.	Asteraceae	<i>Saussurea fastuosa</i> (Decne.) Sch. Bip.		Herb	Chamelia Valley	2,700-3,800		29,00-3,800	WC	3		
94.	Asteraceae	<i>Saussurea gossipiphora</i> D. Don	Ghangla motong, Bhulkesh, Kapasephul	Herb	Mechhra-Kalagad	4,100-4,300		3,500-5,700	CE	5*	Medicine	Whole plant
95.	Asteraceae	<i>Saussurea graminifolia</i> Wall. ex DC.		Herb	Api Base, Kali Dhunga	4,100-5,600		3,600-5,600	WCE	2		
96.	Asteraceae	<i>Saussurea leontodontoides</i> (DC.) Sch. Bip.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,200-5,500		3,200-5,100	WCE	2		
97.	Asteraceae	<i>Saussurea obvallata</i> (DC.) Edgew.		Herb	Api Base, Mechhra-Kalagad	3,800-4,600		3,800-4,600	WCE	2, 5*		
98.	Asteraceae	<i>Senecio analogus</i> DC.		Herb	Chaugantaya-Kuntisau	2,500		1,400-4,000	WCE	5*		
99.	Asteraceae	<i>Senecio chrysanthemoides</i> var. <i>chrysanthemoides</i> DC.		Herb	Chamelia Valley	3,000-3,800		1,400-4,000	WCE	3*		
100.	Asteraceae	<i>Senecio raphanifolius</i> Wall. ex DC.		Herb				2,300-4,000	WCE	2		
101.	Asteraceae	<i>Sigesbeckia orientalis</i> L.		Herb				400-2,700	WCE	1		
102.	Asteraceae	<i>Synotis cappa</i> (Buch.-Ham. ex D. Don) C. Jeffrey & Y.L. Chen		Herb				1,400-3,900	WCE	1		
103.	Asteraceae	<i>Taraxacum eriopodum</i> (D. Don) DC.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,300-4,600		3,300-4,600	WCE	2		
104.	Asteraceae	<i>Xanthium strumarium</i> L.		Herb				100-2,500	WCE	1		
105.	Balsaminaceae	<i>Impatiens bicornuta</i> Wall.		Herb	Chamelia Valley	2,100-2,800		1,900-2,600	WCE	3*		
106.	Balsaminaceae	<i>Impatiens sulcata</i> Wall.	Banvangro, Talmajero, Swarkpa, Pharpahre	Herb	Chamelia Valley	2,300-3,700		3,500-3,800	WC	3*		
107.	Balsaminaceae	<i>Impatiens urticifolia</i> Wall.		Herb	Chamelia Valley			2,700-3,800	WCE	3*		
108.	Begoniaceae	<i>Begonia picta</i> Sm.		Herb				600-2,800	WCE	1		
109.	Berberidaceae	<i>Berberis aristata</i> DC.	Chutro, Daruharidra	Shrub	Chamelia Valley, Khar	2,270-2,800		1,800-3000	WC	1, 3	Food, Dye	Fruit, Bark

177.	Crassulaceae	<i>Rhodiola wallichiana</i> (Hook.) S.H. Fu		Herb	Api Base	3,300–4,200	3,000–5,500	WCE	2		
178.	Crassulaceae	<i>Sedum multicaule</i> Wall. ex Lindl.		Herb	Chamelia Valley	2,400–3,100	1,300–3,200	WCE	3*		
179.	Cucurbitaceae	<i>Solena heterophylla</i> Lour.		Creepers	Khar	2,219	1,600–3,200	WCE	4		
180.	Cyperaceae	<i>Carex atrata</i> subsp. <i>pullata</i> (Boott) Kük.		Herb			3,500–4,400	WCE	2		
181.	Cyperaceae	<i>Carex myosuroides</i> Nees		Herb	Thin	2,300	800–2,900	CE	5*		
182.	Cyperaceae	<i>Cyperus cyperinus</i> (Retz.) Suringar		Herb	Khar	2,273	600–2,100	WCE	4*		
183.	Cyperaceae	<i>Cyperus squarrosus</i> L.		Herb	Rapla-Tangbang	2,000	1,100–2,700	WC	5*		
184.	Cyperaceae	<i>Eriophorum comosum</i> (Wall.) Nees		Herb	Darchula-Huti	900	500–2,600	WCE	5*		
185.	Cyperaceae	<i>Kobresia nepalensis</i> (Nees) Kük.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga	2,900–5,700	2,900–5,700	WCE	2		
186.	Daphniphyllaceae	<i>Daphniphyllum himalense</i> (Benth.) Müll. Arg.		Tree			1,400–2,300	WCE	1		
187.	Dioscoreaceae	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Ban tarul	Climber	Chamelia Valley	2,000–2,700	450–3,100	WCE	3*	Food	Tuber
188.	Dipterocarpaceae	<i>Shorea robusta</i>	Sal	Tree							
189.	Elaeagnaceae	<i>Elaeagnus parvifolia</i> Wall. ex Royle	Guyeli, Malino	Tree	Khar, Khyakot	2,000–2,280	1,300–3,000	WCE	3, 4	Food	Fruit
190.	Elaeagnaceae	<i>Hippophae salicifolia</i> D. Don	Chuk, Shankhadhara	Tree	Chamelia Valley, Kuntisau	2,500–2,900	2,200–3,500	WC	3, 4, 5*	Food, Medicine	Fruit
191.	Ericaceae	<i>Cassiope fastigiata</i> (Wall.) D. Don	Madhuparni	Shrub	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	2,800–5,500	2,800–5,000	WCE	2	Medicine	Leaf
192.	Ericaceae	<i>Gaultheria trichophylla</i> Royle		Herb	Api Base, Tadhapani,	2,700–4,500	2,700–4,500	WCE	2		
193.	Ericaceae	<i>Lyonia ovalifolia</i> (Wall.) Drude		Tree	Khar	1,700–2,211	1,300–3,300	WCE	1, 4		
194.	Ericaceae	<i>Rhododendron anthopogon</i> D. Don	Chimale	Shrub	Nampa Valley	3,500	3,300–5,100	WCE	2, 5*	Incense	Flower, Leaf
195.	Ericaceae	<i>Rhododendron arboreum</i> Sm.		Tree	Chamelia Valley, Dopakhe-Thin, Khar	1,500–3,300	1,500–3,300	WCE	1, 3, 4, 5*		
196.	Ericaceae	<i>Rhododendron barbatum</i> Wall. ex G. Don		Tree	Chamelia Valley	2,800–3,100	2,700–3,600	WCE	3*		
197.	Ericaceae	<i>Rhododendron campanulatum</i> D. Don	Ratokpa	Shrub	Chamelia Valley, Kuntisau	3,000–3,600	2,800–4,400	WCE	2, 3, 5*	Utensils	Flower, wood
198.	Ericaceae	<i>Rhododendron lepidatum</i> Wall. ex G. Don	Sunpati	Shrub	Api Khola, Dandafaya	3,000	2,100–4,700	WCE	5*	Incense	Leaf, Flower
199.	Euphorbiaceae	<i>Euphorbia sikkimensis</i> Boiss.		Herb	Thin-Dandap	2,500	2,400	WE	5*		
200.	Euphorbiaceae	<i>Euphorbia stracheyi</i> Boiss.		Herb	Api Base, Kali Dhunga, Tadhapani	2,000–5,000	2,000–5,000	WCE	2		

201.	Euphorbiaceae	<i>Sapium insigne</i> (Royle) Benth. & Hook. f.	Khirro	Tree	Chamelia Valley	2,000	500–1,800	WCE	4*	Medicine	Latex
202.	Fabaceae	<i>Astragalus rhizanthus</i> subsp. <i>candolleanus</i> (Royle ex Benth.) Podlech		Herb	Chire Dhunga, Gauchhali Ghol	3,500–4,500	2,700–4,500	WC	2		
203.	Fabaceae	<i>Astragalus strictus</i> Graham ex Benth.		Herb	Chamelia Valley	2,700–3,800	2,100–5,000	WCE	3		
204.	Fabaceae	<i>Caesalpinia decapetala</i> (Roth) Alston		Climber		1,100	1,000–2,000	WCE	1		
205.	Fabaceae	<i>Chamaecrista mimosoides</i> (L.) Greene		Herb	Darchula-Huti		700–2,500	WCE	5*		
206.	Fabaceae	<i>Crotalaria albida</i> Heyne ex Roth		Herb			450–2,200	WCE	1		
207.	Fabaceae	<i>Crotalaria cytisoides</i> DC.		Shrub	Chamelia Valley		1,200–1,900	WCE	3*		
208.	Fabaceae	<i>Crotalaria sessiliflora</i> L.		Herb			200–2,800	WCE	1		
209.	Fabaceae	<i>Desmodium concinnum</i> DC.		Shrub			1,300–2,200	WCE	1		
210.	Fabaceae	<i>Desmodium elegans</i> DC.	Bhatyau	Shrub	Chamelia Valley, Khar	2,700–3,000	1,200–3,000	WC	3, 4		
211.	Fabaceae	<i>Desmodium heterocarpon</i> (L.) DC.	Chamyau	Shrub	Khar	1,300–2,100	400–1,700	WCE	1, 4*		
212.	Fabaceae	<i>Indigofera atropurpurea</i> Buch.-Ham. ex Hornem.	Sagina	Shrub	Khar	2,280	700–3,200	WCE	4		
213.	Fabaceae	<i>Indigofera bracteata</i> Graham ex Baker		Shrub	Chamelia Valley	3,000	1,600–3,200	WCE	3*		
214.	Fabaceae	<i>Lespedeza gerardiana</i> Graham		Herb			2,400–2,600	WC	1		
215.	Fabaceae	<i>Medicago falcata</i> L.		Herb	Kali Dhunga	2,700–4,400	2,700–4,000	WC	2		
216.	Fabaceae	<i>Parochetus communis</i> Buch.-Ham. ex D. Don		Herb	Chamelia Valley	2,700–3,800	900–4,000	WCE	1, 3		
217.	Fabaceae	<i>Piptanthus nepalensis</i> (Hook.) D. Don	Solsaino, Naltudo	Shrub	Chamelia Valley	3,000–3,300	2,000–3,800	WCE	3*	Medicine	Bark
218.	Fabaceae	<i>Smithia ciliata</i> Royle		Herb			1,200–2,800	WCE	1		
219.	Fabaceae	<i>Trifolium repens</i> L.	Jhalomalo, Tinpate	Herb	Khandeshwori	2,600	1,500–2,500	WC	3*	Medicine	Whole plant
220.	Fabaceae	<i>Trigonella emodi</i> Benth.		Herb	Chamelia Valley	2,800	1,300–4,900	WCE	3*		
221.	Fabaceae	<i>Uraria lagopus</i> DC.		Shrub			1,400–2,400	WCE	1		
222.	Fabaceae	<i>Vicia sativa</i> subsp. <i>nigra</i> (L.) Ehrh.		Climber			200–4,000	WCE	1	Food	
223.	Fabaceae	<i>Zornia gibbosa</i> Span.		Herb			450–2,200	WCE	1		
224.	Fagaceae	<i>Quercus lanata</i> Sm.	Seto banjh, Dhadlaj	Tree	Khar	2,078–2,378	460–2,600	WCE	1, 4	Medicine	Fruit
225.	Fagaceae	<i>Quercus semecarpifolia</i> Sm.	Timsu, Thula banjh	Tree	Chamelia Valley, Khar	2,270–3,500	1,700–3,800	WCE	1, 3, *, 4*		

226.	Gentianeaceae	<i>Comastoma falcatum</i> (Turcz. ex Kar. & Kir.) Toyok.		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	3, 100–5,300		CE	2	
227.	Gentianeaceae	<i>Gentiana capitata</i> Buch.-Ham. ex D. Don		Herb	Kali Dhunga, Tadhapani	1, 500–4,500		WCE	2	
228.	Gentianeaceae	<i>Gentiana stipitata</i> Edgew.		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	3, 200–4,500		W	2	
229.	Gentianeaceae	<i>Halenia elliptica</i> D. Don	Nakkali tite	Herb	Chamelia Valley	2, 600–3, 100		WCE	3	
230.	Gentianeaceae	<i>Lomatogonium carinthiacum</i> (Wulfen) Rchb.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3, 500–5, 000		WCE	2	
231.	Gentianeaceae	<i>Swertia angustifolia</i> Buch.-Ham. ex D. Don	Chiraito, Tite	Herb		600–2, 600		WCE	1	Medicine
232.	Gentianeaceae	<i>Swertia chirayita</i> H. Karst.	Chiraito, Tite	Herb	Chamelia Valley, Khar	2, 221		CE	1, 3, 4	Medicine
233.	Gentianeaceae	<i>Swertia ciliata</i> (D. Don ex G. Don) B.L. Burtt		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	2, 800–4, 000		WCE	2, 3*	Medicine
234.	Gentianeaceae	<i>Swertia cordata</i> (Wall. ex G. Don) C.B. Clarke		Herb		2, 000–3, 000		WCE	1	
235.	Gentianeaceae	<i>Swertia cuneata</i> Wall. ex D. Don	Chiraito, Tite	Herb	Kali Dhunga	3, 900–5, 000		WCE	2	Medicine
236.	Gentianeaceae	<i>Swertia nervosa</i> (Wall. ex G. Don) C.B. Clarke		Herb		700–3, 500		WCE	1	
237.	Gentianeaceae	<i>Swertia petiolata</i> D. Don		Herb	Chamelia Valley, Kali Dhunga	3, 500–5, 600		W	2, 3*	
238.	Geraniaceae	<i>Geranium donianum</i> Sweet		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3, 200–4, 800		WCE	2	
239.	Geraniaceae	<i>Geranium nepalense</i> Sweet		Herb	Chamelia Valley	2, 300–3, 200		WC	3	
240.	Geraniaceae	<i>Geranium pratense</i> L.		Herb	Chamelia Valley	2, 700–3, 600		WC	3	
241.	Geraniaceae	<i>Geranium procurrens</i> Yeo		Herb		2, 100–3, 500		WCE	1	
242.	Gesneriaceae	<i>Chirita bifolia</i> D. Don		Herb	Pari Bagar-Makarigad	1, 160		WCE	5*	
243.	Gesneriaceae	<i>Lysionotus serratus</i> D. Don		Herb	Chamelia Valley, Khandeshwori	2, 000–2, 600		WC	3*	
244.	Gesneriaceae	<i>Rhynchoglossum obliquum</i> Blume		Herb		800–2, 100		WCE	1	
245.	Grossulariaceae	<i>Ribes glaciale</i> Wall. ex Roxb.		Shrub	Chamelia Valley	2, 800–3, 700		WCE	3*	
246.	Grossulariaceae	<i>Ribes luridum</i> Hook. f. & Thomson		Shrub	Chamelia Valley	2, 700–3, 800		WCE	3*	

247.	Grossulariaceae	<i>Ribes takare</i> D. Don					Chhetri-Mechhra	2,950	1,800–3,600	WCE	5*	
248.	Hydrangeaceae	<i>Deutzia compacta</i> Craib	Kankunyu, Bhyatkude				Chamelia Valley, Khar	2,100–3,300	2,100–3,400	WCE	3, 4	
249.	Hydrangeaceae	<i>Dichroa febrifuga</i> Lour.							900–2,400	WCE	1	
250.	Hydrangeaceae	<i>Hydrangea anomala</i> D. Don					Chamelia Valley	2,200–2,900	1,900–2,700	WCE	3*	
251.	Hydrangeaceae	<i>Hydrangea heteromalla</i> D. Don					Chamelia Valley	2,700–3,000	2,400–3,300	WCE	3*	
252.	Hydrangeaceae	<i>Philadelphus tomentosus</i> Wall. ex G. Don					Chamelia Valley	2,700–2,800	2,000–3,300	WCE	3	
253.	Hypericaceae	<i>Hypericum uralum</i> Buch.-Ham. ex D. Don	Rato miredo					2,078–2,307	1,200–3,600	WCE	1, 4	Medicine
254.	Juncaginaceae	<i>Triglochin palustris</i> L.					Chhangru	2,900	2,900–4,700	WC	5*	
255.	Juglandaceae	<i>Juglans regia</i> L.	Okhar				Chamelia Valley	2,000–2,700	1,200–2,100	WCE	1, 3*, 4	Oil, Food
256.	Juncaceae	<i>Juncus himalensis</i> Klotzsch					Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,200–5,200	3,200–5,200	WCE	2	
257.	Juncaceae	<i>Juncus membranaceus</i> Royle					Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,000–4,000	3,000–3,700	WC	2	
258.	Lamiaceae	<i>Ajuga integrifolia</i> Buch.-Ham					Kasoti-Chheti	2,550	1,200–5,100	WCE	5*	
259.	Lamiaceae	<i>Anisomeles indica</i> (L.) Kuntze					Chamelia Valley	2,000–2,300	2,000–2,400	WCE	3*	
260.	Lamiaceae	<i>Coleus barbatus</i> (Andrews) Benth.					Chamelia Valley	2,000–2,400	1,000–2,500	WCE	3*	
261.	Lamiaceae	<i>Colquhounia coccinea</i> Wall.					Tangbang	1,300–2,100	1,200–4,200	WCE	5*	
262.	Lamiaceae	<i>Eisholtzia ciliata</i> (Thunb.) Hyl.						1,700–1,900	1,500–3,400	WCE	1, 5	
263.	Lamiaceae	<i>Eisholtzia eriostachya</i> (Benth.) Benth.	Lenja				Kali Dhunga	3,000–4,800	3,000–4,800	WCE	1, 2	
264.	Lamiaceae	<i>Eisholtzia fruticosa</i> (D. Don) Rehder					Chamelia Valley	2,000–2,600	1,800–4,200	WCE	1, 3*	
265.	Lamiaceae	<i>Eisholtzia pilosa</i> (Benth.) Benth.							1,500–2,500	WCE	1	
266.	Lamiaceae	<i>Isodon angustifolius</i> (Dunn) Kudô									1	
267.	Lamiaceae	<i>Isodon lophanthoides</i> (Buch.-Ham. ex D. Don) H. Hara							1,300–2,700	WCE	1	
268.	Lamiaceae	<i>Lamium album</i> L.						2,000–3,200	1,500–3,700	WC	3	
269.	Lamiaceae	<i>Leonurus cardiaca</i> L.					Tolgaon	2,100	2,400–3,600	WC	5*	
270.	Lamiaceae	<i>Leucosceptrum canum</i> Sm.	Phultusa					2,700–3,800	1,000–2,800	WCE	1, 3, 4	
271.	Lamiaceae	<i>Mentha spicata</i> L.							1,800–2,700	WC	4*	
272.	Lamiaceae	<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth.							900–1,400	WC	1	

273.	Lamiaceae	<i>Nepeta laevigata</i> (D. Don) Hand-Mazz.			Herb					2,000–5,000	WCE	1, 5	
274.	Lamiaceae	<i>Nepeta lamiopsis</i> Benth. ex Hook. f.			Herb	Chamelia Valley	3,560			3,300–5,300	WCE	3	
275.	Lamiaceae	<i>Nepeta lamiopsis</i> Benth. ex Hook. f.			Herb	Chamelia Valley	2,700–3,800			3,300–5,300	WCE	1, 3	
276.	Lamiaceae	<i>Origanum vulgare</i> L.	Ramtulsi		Herb	Churani-Lambagar, Khar	800–2,500			600–4,000	WC	1, 4*, 5*	Medicine
277.	Lamiaceae	<i>Perilla frutescens</i> (L.) Britton			Herb					600–2,400	WCE	4*	
278.	Lamiaceae	<i>Phlomis bracteosa</i> (Royle ex Benth.) Kamelin & Makhm.			Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	2,400–4,100			3,600–3,800	WC	2, 3*	
279.	Lamiaceae	<i>Phlomis macrophylla</i> (Benth.) Kamelin & Makhm.			Herb	Kali Dhunga	2,300–4,500			2,500–3,300	WCE	2	
280.	Lamiaceae	<i>Prunella vulgaris</i> L.			Herb		1,700			1,200–3,800	WCE	1	
281.	Lamiaceae	<i>Salvia campanulata</i> Wall. ex Benth.			Herb					2,400–3,800	WCE	1	
282.	Lamiaceae	<i>Scutellaria prostrata</i> Jacquem. ex Benth.			Herb	Chamelia Valley	2,800–3,400			2,400–4,500	WC	3*	
283.	Lamiaceae	<i>Scutellaria repens</i> Buch.-Ham. ex D. Don	Kaukhutte		Herb	Khar	2,217			600–2,100	WCE	1, 4	
284.	Lamiaceae	<i>Stachys melissaefolia</i> Benth.			Herb	Chamelia Valley	3,300			2,100–4,000	WCE	3*	
285.	Lamiaceae	<i>Vitex negundo</i> L.	Simali		Shrub					100–1,200	WCE	5*	Medicine
286.	Lardizabalaceae	<i>Holboellia angustifolia</i> Wall.			Climber		2,700–3,800			2,000–4,000	WCE	1, 3	
287.	Lardizabalaceae	<i>Holboellia latifolia</i> Wall.			Climber	Khandeshwori	2,621			2,000–4,000	WCE	3	
288.	Lauraceae	<i>Cinnamomum tamala</i> (Buch.-Ham.) Nees & Eberm.	Tejpat, Dalchini, Bahuganda, Tachula		Tree	Khar				450–2,000	WCE	4*	Medicine
289.	Lauraceae	<i>Persea odoratissima</i> (Nees) Kosterm.	Kaulo		Tree	Khar	1900			1000-2000	WCE		
290.	Lauraceae	<i>Lindera pulcherrima</i> (Nees) Hook. f.			Tree	Khar	2,210			1,400–2,700	WCE	4	
291.	Lauraceae	<i>Neolitsea pallens</i> (D. Don) Momiy. & H. Hara			Tree	Chamelia Valley, Khar	2,000–2900			1,700–3,500	WCE	3, 4	
292.	Liliaceae	<i>Cardiocrinum giganteum</i> (Wall.) Makino			Herb	Chamelia Valley	2,600			1,800–3,000	WCE	3*	
293.	Liliaceae	<i>Fritillaria cirrhosa</i> D. Don	Podhya		Herb	Bayeli, Chire Dhunga, Gauchhali Ghol, Kali Dhunga, Shiyela	3,000–4,600			3,000–4,600	WCE	2, 3, 4	Medicine
294.	Liliaceae	<i>Lilium nanum</i> Klotzsch			Herb	Gauchhali Ghol, Chire Dhunga, Kali Dhunga	3,700–4,600			3,700–4,600	WCE	2, 3*	
295.	Liliaceae	<i>Lilium nepalense</i> D. Don			Herb	Kasoti-Chheti	3,600–3,700			2,300–3,400	WCE	5*	

296.	Liliaceae	<i>Lloydia longiscapa</i> Hook.				Herb	Api Base, Kali Dhunga	4,000–5,000	4,000–5,000	WCE	2	
297.	Linaceae	<i>Reinwardtia indica</i> Dumort.	Pyuli		2,271	Shrub	Khar	300–2,300	300–2,300	WCE	4*	
298.	Linderniaceae	<i>Lindernia antipoda</i> (L.) Alston				Herb		500–2,300	500–2,300	WCE	1	
299.	Linderniaceae	<i>Lindernia ciliata</i> (Colsm.) Pennell				Herb		700–1,500	700–1,500	WCE	1	
300.	Linderniaceae	<i>Lindernia crustacea</i> (L.) F. Muell.			840	Herb		250–1,800	250–1,800	WCE	1, 5*	
301.	Loranthaceae	<i>Scurrula elata</i> (Edgew.) Danser			2,600	Shrub	Chamelia Valley	1,600–2,700	1,600–2,700	WCE	3*	
302.	Loranthaceae	<i>Scurrula parasitica</i> L.			2,245	Shrub	Khar	1,600–2,700	1,600–2,700	WCE	4	
303.	Malvaceae	<i>Urena lobata</i> L.				Subshrub		200–1,300	200–1,300	WCE	1	
304.	Melanthiaceae	<i>Paris polyphylla</i> Sm.	Satuwa		2,800–3,200	Herb	Khandeshwori	1,800–3,300	1,800–3,300	WCE	3*, 4*	Medicine
305.	Melastomataceae	<i>Osbeckia stellata</i> Wall. ex C.B. Clarke				Subshrub		1,300–2,600	1,300–2,600	WCE	1	
306.	Meliaceae	<i>Toona ciliata</i> M. Roem.			900–1,300	Tree	Darchula-huti	200–1,700	200–1,700	WCE	4*, 5*	
307.	Meliaceae	<i>Toona sinensis</i> (Juss.) M. Roem.				Tree		2,100–2,300	2,100–2,300	WC	3*	
308.	Menispermaceae	<i>Cissampelos pareira</i> L.	Batul pate			Climber		150–2,200	150–2,200	WCE	1	Medicine
309.	Menispermaceae	<i>Cocculus laurifolius</i> DC.	Tilphora		900–1,100	Shrub		1,000–1,500	1,000–1,500	WC	5*	
310.	Menispermaceae	<i>Stephania glabra</i> (Roxb.) Miers			2,000–2,700	Climber	Chamelia Valley	1,000–2,500	1,000–2,500	WCE	3*, 4*	
311.	Moraceae	<i>Ficus nerifolia</i> Sm.			2,212	Tree	Khar	1,400–2,200	1,400–2,200	WCE	4	
312.	Moraceae	<i>Ficus religiosa</i> L.	Peepal			Tree		150–1,500	150–1,500	WCE	4*	Medicine, Ritual
313.	Moraceae	<i>Ficus sarmentosa</i> Buch.-Ham. ex Sm.	Ban timila		2,000–2,100	Climber	Chamelia Valley	1,400–2,500	1,400–2,500	WCE	3*	
314.	Myricaceae	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don	Kaphal		2,200	Tree	Chamelia Valley, Khar	1,200–2,300	1,200–2,300	WCE	4*	Food, Medicine
315.	Myrtaceae	<i>Syzygium cumini</i> (L.) Skeels	Jamun			Tree		300–1,200	300–1,200	WCE	4*	Food
316.	Nartheciaceae	<i>Aletris pauciflora</i> (Klotzsch) Hand.-Mazz.			2,500–4,900	Herb	Api Base, Gauchhali Ghol, Kali Dhunga	2,500–4,900	2,500–4,900	WCE	2	
317.	Oleaceae	<i>Chionanthus ramiflorus</i> Roxb.			500	Shrub		500	500	WE	1	
318.	Oleaceae	<i>Fraxinus floribunda</i> Wall.			1,200–2,000	Tree		1,200–2,000	1,200–2,000	WCE	1	
319.	Oleaceae	<i>Jasminum dispersum</i> Wall.	Chichmiro		2,200	Climber	Chamelia Valley, Khar	1,500–2,300	1,500–2,300	WCE	1, 3*, 4*	
320.	Oleaceae	<i>Jasminum humile</i> L.	Jai		2,300–2,800	Climber	Chamelia Valley, Thin	1,600–3,400	1,600–3,400	WC	3, 4, 5*	Ritual, Medicine
321.	Oleaceae	<i>Syringa emodi</i> Wall. ex Royle	Aadi		3,000–3,600	Shrub	Chamelia Valley	2,500–3,600	2,500–3,600	WC	3	Medicine
322.	Onagraceae	<i>Epilobium brevifolium</i> D. Don			1,500–4,000	Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	1,500–4,000	1,500–4,000	WC	2	
323.	Onagraceae	<i>Epilobium wallichianum</i> Hausskn.			1,700–4,100	Herb	Kali Dhunga	1,700–3,000	1,700–3,000	WCE	2	

324.	Onagraceae	<i>Oenothera rosea</i> L'Hér. ex Aiton		Herb	Khar	2,300	1,100–2,500	WC	1	
325.	Orchidaceae	<i>Calanthe mannii</i> Hook. f.	Badhar ko dhoi	Herb		2,300	2,300–2,500	CE	4	
326.	Orchidaceae	<i>Calanthe tricarinata</i> Lindl.		Herb	Khandeshwori	2,500	1,500–3,200	WC	3	
327.	Orchidaceae	<i>Cephalanthera erecta</i> var. <i>oblanceolata</i>		Herb	Khar	2,100–2,300	2,000–2,300	WC	6	
328.	Orchidaceae	<i>Cephalanthera longifolia</i> (L.) Fritsch		Herb	Chamelia Valley	3,100	1,200–3,200	WC	3	
329.	Orchidaceae	<i>Cypripedium himalaicum</i> Rolfe		Herb	Gauchhali Ghol	3,000–4,800	3,000–4,800	WCE	2	
330.	Orchidaceae	<i>Dactylophiza hatagirea</i> (D. Don) Soó	Hattijara, Hattijari, Panchaule, Salampanja	Herb	Gauchhali Ghol, Kali Dhunga	2,800–4,100	2,800–4,200	WCE	2, 4	Medicine Whole plant, Tuber
331.	Orchidaceae	<i>Dienia cylindrostachya</i> Lindl.		Herb	Dopakhe-Thin	2,100–2,700	2,000–4,000	WCE	5*	
332.	Orchidaceae	<i>Habenaria arietina</i> Hook. f.		Herb	Kasoti	2,400	2,400–3,900	WCE	5*	
333.	Orchidaceae	<i>Habenaria pectinata</i> D. Don		Herb	Chamelia Valley	2,600–3,500	500–3,500	WCE	3*	
334.	Orchidaceae	<i>Hermidium josephi</i> Rchb. f.		Herb	Chhet-Mechhra	2,700–3,400	2,700–4,400	WCE	2, 5*	
335.	Orchidaceae	<i>Neottia listeroides</i> Lindl.		Herb			2,700–3,400	WC	3	
336.	Orchidaceae	<i>Peristylus duthiei</i> (Hook. f.) Deva & H.B. Naithani		Herb	Chamelia Valley	3,000–3,400	2,800–4,600	WCE	3*	
337.	Orchidaceae	<i>Peristylus elisabethae</i> (Duthie) R.K. Gupta		Herb	Tipulchyaniki	2,800–2,900	900–3,200	WCE	5*	
338.	Orchidaceae	<i>Platanthera clavigera</i> Lindl.		Herb	Thin	2,300	1,300–4,600	WCE	5*	
339.	Orchidaceae	<i>Satyrium nepalense</i> D. Don		Herb	Thin	2,300	600–4,600	WCE	5*	
340.	Orchidaceae	<i>Spiranthes sinensis</i> (Pers.) Ames		Herb	Chhangru	2,300–2,900	100–3,700	WCE	5*	
341.	Orobanchaceae	<i>Pedicularis bicornuta</i> Klotzsch		Herb	Chire Dhunga, Gauchhali Ghol, Kali Dhunga	2,700–4,400		WC	2	
342.	Orobanchaceae	<i>Pedicularis gracilis</i> Wall. ex Benth.		Herb	Chamelia Valley	3,648	2,200–3,800	WCE	3	
343.	Orobanchaceae	<i>Pedicularis heteroglossa</i> Pusalkar & D.K. Singh		Herb	Gauchhali Ghol, Tadhapani	3,600–5,100			2	
344.	Orobanchaceae	<i>Pedicularis klotzschii</i> Hurus.		Herb	Chamelia Valley	3,200–3,800	2,300–4,500	WC	3*	
345.	Orobanchaceae	<i>Pedicularis porrecta</i> Wall.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,600–4,600	3,000–4,000	WCE	2	
346.	Orobanchaceae	<i>Pedicularis roylei</i> Maxim.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,800–5,600	3,400–4,000	WCE	2	

371.	Poaceae	<i>Digitaria cruciata</i> (Nees ex Steud.) A. Camus		Herb	Dumli-Rapla	1,800	1,300–3,500	WCE	5*	
372.	Poaceae	<i>Drepanostachyum falcatum</i> (Nees) Keng f.	Nigalo	Herb	Chamelia Valley, Khar	2,200–2,700	1,500–2,200	WCE	3*, 4*	
373.	Poaceae	<i>Echinochloa crusgalli</i> (L.) P. Beauv.		Herb	Rapla	1,800	700–2,400	WCE	5*	
374.	Poaceae	<i>Eleusine indica</i> (L.) Gaertn.		Herb	Darchula-Hui	900	600–2,600	WCE	1, 5*	
375.	Poaceae	<i>Imperata cylindrica</i> (L.) P. Beauv.	Siru	Herb	Khar	2,200	700–2,400	WCE	1, 4*	Medicine
376.	Poaceae	<i>Melica onoei</i> Franch. & Sav.		Herb	Dandap	2,500	2,500–3,300	WCE	5*	
377.	Poaceae	<i>Muhlenbergia himalayensis</i> Hack. ex Hook. f.		Herb	Rapla-Tangbang	1,800	2,900	W	5*	
378.	Poaceae	<i>Oplismenus compositus</i> (L.) P. Beauv.	Chitre ghans	Herb	Khar	2,271	300–2,800	WCE	4*	
379.	Poaceae	<i>Pennisetum flaccidum</i> Griseb.		Herb	Tinkar	3,500	1,700–4,300	WC	5*	
380.	Poaceae	<i>Phacelurus speciosus</i> (Steud.) C.E. Hubb.		Herb	Dandap	2,500	2,500–2,700	W	5*	
381.	Poaceae	<i>Phleum alpinum</i> L.		Herb	Kali Dhunga	2,400–4,400	2,400–4,400	WCE	2	
382.	Poaceae	<i>Piptatherum aequiglume</i> (Duthie ex Hook. f.) Roshev.		Herb	Thin-Dandap	2,500	2,300–4,300	WCE	5*	
383.	Poaceae	<i>Setaria verticillata</i> (L.) P. Beauv.		Herb	Darchula-Hui	900	300–800	WE	5*	
384.	Poaceae	<i>Sporobolus pilifer</i> (Trin.) Kunth		Herb	Dumli-Rapla	1,800	400–2,400	WCE	1, 5*	
385.	Poaceae	<i>Tenaxia cumminsi</i> (Hook. f.) N.P. Barker & H.P. Linder		Herb	Api Base, Gauchhali Ghol, Kali Dhunga	2,200–4,500	2,200–4,100	WCE	2	
386.	Polygalaceae	<i>Polygala abyssinica</i> R. Br. ex Fresen.		Herb			1,300–2,700	WC	1	
387.	Polygalaceae	<i>Polygala furcata</i> Royle		Herb			600–1,700	WC	1	
388.	Polygonaceae	<i>Aconogonon rumicifolium</i> (Royle ex Bob.) H. Hara	Bhuj	Herb	Gauchhali Ghol, Kali Dhunga, Tadhapani	3,300–4,400	3,300–4,400	WC	2, 3*	Medicine
389.	Polygonaceae	<i>Aconogonon molle</i> (D. Don) H. Hara	Chaullaye, Thothe	Subshrub	Khar	2,270	2,100–4,000	WCE	1, 3*	Vegetable
390.	Polygonaceae	<i>Bistorta affinis</i> D. Don		Herb	Api Base, Chamelia Valley, Tadhapani	3,500–4,900	3,500–4,800	WCE	2, 3*	
391.	Polygonaceae	<i>Bistorta amplexicaulis</i> (D. Don) Greene	Chainphul	Herb	Chamelia Valley, Shiyela	3,544	2,100–4,800	WCE	3, 4	
392.	Polygonaceae	<i>Bistorta macrophylla</i> (D. Don) Soják		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	2,700–5,000	2,700–4,500	WCE	2	
393.	Polygonaceae	<i>Bistorta vivipara</i> (L.) Delarbre		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,300–5,000	3,300–5,000	WCE	2	

394.	Polygonaceae	<i>Fagopyrum acutatum</i> (Lehm.) Mansf. ex K. Hammer	Ban ved	Herb	Chamelia Valley	2,300–2,600	1,500–3,400	WCE	1, 3*	Vegetable	Root, Leaf, Young stem
395.	Polygonaceae	<i>Koenigia nepalensis</i> D. Don		Herb	Kali Dhunga	3,700–3,900	2,800–4,900	WCE	2		
396.	Polygonaceae	<i>Oxyria digyna</i> (L.) Hill	Boke, Bojo	Herb		2,400–3,800	2,400–5,000	WCE	1, 2	Medicine	Leaf
397.	Polygonaceae	<i>Persicaria capitata</i> (Buch.-Ham. ex D. Don) H. Gross	Ratnaulo	Herb	Chamelia Valley, Khar	2,000–2,400	600–2,400	WCE	1, 3*, 4*		
398.	Polygonaceae	<i>Persicaria chinensis</i> (L.) Nakai		Herb			1,200–2,900	WCE	1		
399.	Polygonaceae	<i>Persicaria nepalensis</i> (Meisn.) H. Gross		Herb		1,000–1,300	1,200–4,100	WCE	1		
400.	Polygonaceae	<i>Polygonum recumbens</i> Royle ex Bab.		Herb			2,800	W	1		
401.	Polygonaceae	<i>Rheum australe</i> D. Don	Padamchal, Amalbeth, Karachulthi	Herb	Chamelia Valley	3,500–3,700	3,200–4,200	WCE	3*	Dye, Food	Root, Stem
402.	Polygonaceae	<i>Rheum spiciforme</i> Royle		Herb	Gauchhali Ghol, Kali Dhunga	3,300–4,800	3,300–4,800	WC	2		
403.	Polygonaceae	<i>Rumex acetosa</i> L.		Herb	Chamelia Valley	2,000–3,600	2,100–4,100	WC	2, 3*		
404.	Polygonaceae	<i>Rumex hastatus</i> D. Don	Raktebhuj	Shrub	Khar	1,100–2,600	1,100–2,600	WC	1, 4*	Medicine	Root
405.	Polygonaceae	<i>Rumex nepalensis</i> Spreng.	Halya	Herb	Kali Dhunga, Khar	1,000–4,300	1,200–4,200	WCE	2, 4	Medicine	Root, Leaf
406.	Primulaceae	<i>Androsace strigillosa</i> Franch.		Herb	Api Base, Kali Dhunga, Tadhapani	2,400–4,700	2,400–4,700	WC	2		
407.	Primulaceae	<i>Lysimachia congestiflora</i> Hemsl.	Mahajadi	Herb	Khar	2,210	1,600–2,100	WCE	1, 4		
408.	Primulaceae	<i>Lysimachia ferruginea</i> Edgew.		Herb	Khayakot	2,058	1,500–2,600	WCE	1, 3		
409.	Primulaceae	<i>Maesa montana</i> A. DC.		Shrub		1,300–1,400	250–1,500	WCE	1		
410.	Primulaceae	<i>Myrsine africana</i> L.	Chadiyello	Shrub	Khar		1,200–2,300	WC	4		
411.	Primulaceae	<i>Primula atrodentata</i> W.W. Sm.		Herb	Kali Dhunga, Tadhapani	3,500–4,900	3,500–4,900	WCE	2		
412.	Primulaceae	<i>Primula edgeworthii</i> Pax		Herb			2500–4100	WC	1		
413.	Primulaceae	<i>Primula involucrata</i> Wall. ex DUBY		Herb	Chamelia Valley	2,700–4,200	2,700–4,800	WCE	3		
414.	Primulaceae	<i>Primula macrophylla</i> D. Don		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,400–5,600	3,400–5,600	WCE	2, 3		
415.	Primulaceae	<i>Primula primulina</i> (Spreng.) H. Hara		Herb		3,900–4,300	3,400–5,000	WCE	2		
416.	Primulaceae	<i>Primula reptans</i> Hook. f. ex Watt		Herb	Api Base, Tadhapani	3,600–5,700	5,200–5,700	WC	2		
417.	Ranunculaceae	<i>Aconitum spicatum</i> (Brühl) Stapf	Bish jara	Herb	Khandeshwori, Mechhra-Kalagad, Shiyela,	1,800–4,200	1,800–4,200	WCE	2, 4, 5*	Medicine	Tuber

418.	Ranunculaceae	<i>Actaea spicata</i> var. <i>acuminata</i> (Wall. ex Royle) H. Hara		Herb	Simar	2,832	3,000–3,700	W	3		
419.	Ranunculaceae	<i>Anemone demissa</i> Hook. f. & Thomson		Herb	Gauchhali Ghol, Kali Dhunga	2,700–5,600	2,700–5,600	WCE	2,3		
420.	Ranunculaceae	<i>Anemone polyanthes</i> D. Don	Abhijalo	Herb	Kali Dhunga, Tadhapani	2,400–4,400	2,700–4,400	WCE	2	Medicine	Whole plant, Seed
421.	Ranunculaceae	<i>Anemone rivularis</i> Buch.-Ham. ex DC.	Bheda khaja	Herb	Paitha-Chetti	1,600–4,000	1,600–4,000	WCE	5*	Medicine	Whole plant, Seed
422.	Ranunculaceae	<i>Anemone vitifolia</i> Buch.-Ham. ex DC.	Kaptase	Herb	Chamelia Valley	2,600–2,700	1,300–3,300	WCE	1, 3		
423.	Ranunculaceae	<i>Caltha palustris</i> L.		Herb	Chamelia Valley	2,700–3,800	2,400–4,200	WCE	2, 3*		
424.	Ranunculaceae	<i>Clematis buchananiana</i> DC.	Bhalchinno	Climber			1,800–3,300	CE	1, 4*		
425.	Ranunculaceae	<i>Clematis connata</i> DC.		Climber	Chamelia Valley	2,100–3,100	2,400–3,300	WCE	3*		
426.	Ranunculaceae	<i>Clematis montana</i> Buch.-Ham. ex DC.	Chhitko lahara	Climber	Chamelia Valley, Khandeshwori	2,700–3,800	1,600–4,000	WCE	1, 3, 4		
427.	Ranunculaceae	<i>Delphinium brunonianum</i> Royle	Mungresulo	Herb	Kali Dhunga	4,000–6,000	3,500–6,000	WC	2	Medicine	Root
428.	Ranunculaceae	<i>Delphinium himalayae</i> Munz	Atish	Herb	Chamelia Valley	2,100–3,400	3,000–4,500	WC	3*	Medicine	Root
429.	Ranunculaceae	<i>Delphinium vestitum</i> Wall. ex Royle	Atish, Bish	Herb	Kali Dhunga	2,700–4,700	2,700–4,700	WCE	2	Medicine	Whole plant
430.	Ranunculaceae	<i>Oxygraphis polypetala</i> Royle ex D. Don		Herb	Kali Dhunga, Tadhapani	2,200–5,000	2,200–5,000	WCE	2		
431.	Ranunculaceae	<i>Ranunculus brotherusii</i> Freyn		Herb	Gauchhali Ghol, Kali Dhunga	3,000–5,000	3,000–5,000	WCE	2		
432.	Ranunculaceae	<i>Ranunculus diffusus</i> DC.		Herb	Kali Dhunga, Chamelia Valley	1,500–4,000	1,500–4,000	WCE	1, 2, 3		
433.	Ranunculaceae	<i>Thalictrum alpinum</i> L.		Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	2,800–5,000	2,800–5,000	WCE	2		
434.	Ranunculaceae	<i>Thalictrum chelidonii</i> DC.		Herb	Chheti-Lukhani		2,300–3,500	WCE	5*		
435.	Ranunculaceae	<i>Thalictrum cultratum</i> Wall.		Herb	Chamelia Valley, Gauchhali Ghol, Kali Dhunga	2,400–4,200	2,400–4,200	WCE	2, 3		
436.	Ranunculaceae	<i>Thalictrum dalzellii</i> Hook.		Herb		1,200–1,300	1,700–2,000	W	5*		
437.	Ranunculaceae	<i>Thalictrum foliolosum</i> DC.		Herb	Chamelia Valley	2,000–2,700	1,300–3,400	WCE	1, 3		
438.	Rosaceae	<i>Cotoneaster frigidus</i> Wall. ex Lindl.	Rains, Chabra	Shrub	Khandeshwori	2,200–3,800	900–3,400	WCE	3, 4, 5*	Agricultural implements	Branch, Wood
439.	Rosaceae	<i>Cotoneaster microphyllus</i> Wall. ex Lindl.		Shrub	Kali Dhunga	2,000–5,400	900–5,400	WCE	1,2		

440.	Rosaceae	<i>Cotoneaster nitidus</i> Jacq.				Shrub	Chhangru	2,900	1,600–4,000	CE	5*		
441.	Rosaceae	<i>Fragaria nubicola</i> (Hook. f.) Lindl. ex Lacaille	Kappu			Herb	Domule, Kali Dhunga	1,600–4,000	1,600–4,000	WCE	2, 3, 4	Food	Fruit
442.	Rosaceae	<i>Geum elatum</i> Wall. ex G. Don				Herb	Kali Dhunga, Tadhapani	2,700–4,300	2,900–4,500	WCE	2		
443.	Rosaceae	<i>Potentilla argyrophylla</i> Wall. ex Lehm. var. <i>argyrophylla</i>				Herb		4,563	2,800–4,800	WCE	5*		
444.	Rosaceae	<i>Potentilla argyrophylla</i> Wall. ex Lehm. var. <i>atrosanguinea</i> (Lodd.) Hook. f.				Herb	Mechhara	3,300–4,600	2,900–4,600	WCE	2, 3		
445.	Rosaceae	<i>Potentilla commutata</i> var. <i>polyandra</i> Soják				Herb		3,900–4,000	4,000–4,500	WCE	5*		
446.	Rosaceae	<i>Potentilla cuneata</i> Wall. ex Lehm.				Herb			1,900–4,900	WCE	3*		
447.	Rosaceae	<i>Potentilla eriocarpa</i> Wall. ex Lehm.				Herb	Mechhra	3,640	3,500–5,100	WCE	5*		
448.	Rosaceae	<i>Potentilla fruticosa</i> L.				Shrub	Tinkar	3,100–3,500	2,700–4,500	WCE	5		
449.	Rosaceae	<i>Potentilla leuconota</i> D. Don				Herb	Chamelia Valley, Above Shiyela	3,772	3,300–3,800	WCE	3		
450.	Rosaceae	<i>Potentilla lineata</i> Trevir.				Herb	Api Base, Tadhapani	1,600–4,800	1,700–3,700	WCE	2		
451.	Rosaceae	<i>Potentilla microphylla</i> D. Don				Herb	Api Base, Tadhapani	3,700–5,100	3,400–5,200	WCE	2		
452.	Rosaceae	<i>Potentilla monanthes</i> Wall. ex Lehm.				Herb	Chamelia Valley, Nete	3,839	3,000–4,800	WE	3		
453.	Rosaceae	<i>Potentilla nepalensis</i> Hook.				Herb	Khar	2,280	2,000–2,600	W	1, 4*		
454.	Rosaceae	<i>Potentilla peduncularis</i> D. Don				Herb	Gauchhali Ghol	3,000–4,800	3,000–4,700	WCE	2		
455.	Rosaceae	<i>Potentilla saundersiana</i> Royle				Herb			3,100–4,900	WCE	2		
456.	Rosaceae	<i>Potentilla sundaica</i> (Blume) Kuntze				Herb			1,000–2,400	WE	5*		
457.	Rosaceae	<i>Prinsepia utilis</i> Royle	Dhatelo			Shrub	Chamelia Valley, Khar	2,000–2,600	1,100–3,400	WCE	3*, 4*	Edible oil	Seed
458.	Rosaceae	<i>Prunus bracteopadus</i> Koehne				Shrub				E	3*		
459.	Rosaceae	<i>Prunus cerasoides</i> D. Don	Paiyu			Tree	Khar	2,280	1,300–2,700	WCE	4		Bark
460.	Rosaceae	<i>Prunus cornuta</i> (Wall. ex Royle) Steud.	Lek arato			Tree	Chamelia Valley	2,100–3,544	2,100–3,500	WCE	3		
461.	Rosaceae	<i>Prunus nepaulensis</i> (Ser.) Steud.	Arya, Aare, Arato			Tree	Chamelia Valley, Khandeshwori	2,591–3,800	1,600–3,000	WCE	3		Fruit
462.	Rosaceae	<i>Prunus persica</i> (L.) Batsch				Tree			1,300–3,600	WC	1		
463.	Rosaceae	<i>Pyracantha crenulata</i> (D. Don) M. Roem.	Ghangaru			Shrub	Khar	2,290	8,00–2,800	WCE	1, 3		Fruit
464.	Rosaceae	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Mail			Tree	Khar	2,078–2,385	700–3,100	WCE	1, 4*	Food, Medicine	Fruit
465.	Rosaceae	<i>Rosa brunonii</i> Lindl.				Shrub	Dopakhe	1,700–2,500	1,300–3,000	WCE	1, 4*, 5*		
466.	Rosaceae	<i>Rosa macrophylla</i> Lindl.				Shrub	Chheti-Nechhra, Simar	2,879–3,100	2,100–4,400	WCE	3, 4, 5*		

467.	Rosaceae	<i>Rosa sericea</i> Lindl.		Khuiyasi	Shrub	Chamelia Valley	2,600–3,700	2,100–4,600	WCE	3*	Food, Medicine	Flower, Fruit
468.	Rosaceae	<i>Rubus biflorus</i> Buch.-Ham. ex Sm.			Shrub	Chamelia Valley	2,600–3,200	1,500–3,500	WCE	3*		
469.	Rosaceae	<i>Rubus calycinus</i> Wall. ex D. Don			Shrub	Chamelia Valley	2,300–2,600	1,200–3,000	WCE	3*		
470.	Rosaceae	<i>Rubus ellipticus</i> Sm.		Ainselu	Shrub	Khar	2,000–2,300	300–2,600	WCE	1, 4*	Food, Medicine	Fruit, Root
471.	Rosaceae	<i>Rubus foliolosus</i> D. Don		Ainselu, Kalo ainselu	Shrub	Khar	2,300	1,600–3,200	WCE	1, 4*	Food, Medicine	Fruit, Root
472.	Rosaceae	<i>Rubus nepalensis</i> (Hook. f.) Kuntze			Herb	Rapla-Tangbang	1,800–3,200	1,800–3,500	WCE	5*		
473.	Rosaceae	<i>Rubus paniculatus</i> Sm.		Ainselu	Shrub		1,500–3,200	1,500–3,200	WCE	1	Food	Fruit
474.	Rosaceae	<i>Sibbaldia cuneata</i> Hornem. ex Kuntze			Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Tadhapani	3,400–4,500	3,000–4,900	WCE	2		
475.	Rosaceae	<i>Sibbaldia purpurea</i> Royle			Shrub	Api Base	3,900–5,600	3,600–5,700	WCE	2		
476.	Rosaceae	<i>Sorbus foliolosa</i> (Wall.) Spach			Shrub	Chheti-Nechhra	3,200	2,200–4,300	WCE	5*		
477.	Rosaceae	<i>Sorbus lanata</i> (D. Don) Schauer		Pamell, Nalo	Tree	Chamelia Valley, Chheti-Nechhra	2,861–3,000	2,200–3,400	WCE	3, 5*	Food	Fruit
478.	Rosaceae	<i>Sorbus microphylla</i> Wenz.		Bajhar	Shrub	Chamelia Valley, Kuntisau	3,000–3,772	3,000–4,500	WCE	3, 5*		
479.	Rosaceae	<i>Sorbus vestita</i> (Wall. ex G. Don) Lodd.			Tree	Dandap	2,600	1,300–3,700	WCE	5*		
480.	Rosaceae	<i>Spiraea bella</i> Sims			Shrub	Chamelia Valley	2,700–3,800	1,900–4,200	WCE	3		
481.	Rubiaceae	<i>Galium asperifolium</i> Wall.			Herb	Chamelia Valley	2,000–2,600	1,500–3,000	WCE	1, 3, 4*		
482.	Rubiaceae	<i>Galium elegans</i> Wall.			Herb	Khar	2,214	1,400–3,000	WCE	1, 4		
483.	Rubiaceae	<i>Rubia manjith</i> Roxb. ex Fleming		Majitho, Majith	Climber	Khar	1,950	1,200–2,100	WCE	1, 3, 4	Dye	Whole plant
484.	Rubiaceae	<i>Rubia wallichiana</i> Decne.			Climber	Khandeshwori	2,600	1,500–3,200	WCE	3*		
485.	Rutaceae	<i>Boeninghausenia albiflora</i> (Hook.) Rchb. ex Meisn.		Udush jahar	Herb	Khar	2,190	600–3,300	WCE	1, 4		
486.	Rutaceae	<i>Zanthoxylum armatum</i> DC.		Timur	Tree	Khar	2,080	1,100–2,500	WCE	1, 4*	Medicine	Fruit
487.	Salicaceae	<i>Salix hylematica</i> C.K. Schneid.			Herb	Chamelia Valley, Gauchhali Ghol, Kali Dhunga, Tadhapani	2,600–4,500	2,600–4,500	WCE	2, 3		
488.	Salicaceae	<i>Salix lindleyana</i> Wall. ex Andersson			Shrub	Api Base	3,800–5,000	3,800–5,000	WCE	2		

489.	Salicaceae	<i>Salix tetrasperma</i> Roxb.		Tree	Chamelia Valley	2,500–3,100	2,000–2,700	WC	3		
490.	Santalaceae	<i>Osyris quadripartita</i> Salzm. ex Decne.		Shrub			900–2,200	WC	1		
491.	Sapindaceae	<i>Acer cappadocicum</i> Gled.	Tilaailo	Tree	Chamelia Valley	2,100–2,700	2,100–3,000	W	3		Agricultural implements
492.	Sapindaceae	<i>Acer pectinatum</i> Wall. ex G. Nicholson		Tree	Chamelia Valley	2,700–3,200	2,700–3,800	WCE	3		
493.	Sapindaceae	<i>Acer sterculiaceum</i> Wall.		Tree	Chamelia Valley	2,000–2,600	2,200–3,200	WCE	3*		
494.	Sapindaceae	<i>Aesculus indica</i> (Wall. ex Cambess.) Hook.	Pangar	Tree	Chamelia Valley	2,000–2,600	1,900–2,400	WC	1, 3, 4		Medicine
495.	Sapindaceae	<i>Sapindus mukorossi</i> Gaertn.	Ritha	Tree	Chamelia Valley		1,000–1,200	WCE	4*		Medicine
496.	Saxifragaceae	<i>Aspilbe rivularis</i> Buch.-Ham. ex D. Don	Budo okhati	Herb	Chamelia Valley	2,800–3,700	1,400–3,600	WCE	1, 3*		Medicine
497.	Saxifragaceae	<i>Bergenia ciliata</i> (Haw.) Stemb.	Bhidyeti, Pakhanved	Herb	Khar	2,200	900–2,500	WCE	1, 4*		Medicine
498.	Saxifragaceae	<i>Saxifraga aristulata</i> Hook. f. & Thomson		Herb	Gauchhali Ghol, Kali Dhunga	3,000–5,600	3,500–5,200	WCE	2		
499.	Saxifragaceae	<i>Saxifraga mucronulata</i> Royle		Herb	Api Base, Gauchhali Ghol, Kali Dhunga	3,800–4,800	4,500–5,100	WE	2		
500.	Saxifragaceae	<i>Saxifraga parnassifolia</i> D. Don		Herb	Chamelia Valley, Kali Dhunga	2,700–4,900	1,400–4,900	WCE	2, 3		
501.	Schisandraceae	<i>Schisandra grandiflora</i> (Wall.) Hook. f. & Thomson	Gofala	Herb	Khar	2,245	1,500–3,400	WCE	4		
502.	Scrophulariaceae	<i>Scrophularia calycina</i> Benth.		Herb	Kali Dhunga	2,700–4,000	3,800	W	2		
503.	Scrophulariaceae	<i>Scrophularia laportifolia</i> T. Yamaz.		Herb	Darchula	2,700–2,900	2,700–2,900	W	5*		
504.	Scrophulariaceae	<i>Verbascum thapsus</i> L.	Guni puchhar	Herb			1,800–4,000	WCE	1		Medicine
505.	Smilacaceae	<i>Smilax aspera</i> L.	Kukurdatino, Bakhre laharo	Climber	Chamelia Valley	2,000–2,600	1,200–2,600	WCE	1, 3*		Medicine
506.	Smilacaceae	<i>Smilax elegans</i> Wall. ex Kunth	Kukdeulo	Climber	Khar	2,270–2,340	1,600–2,450	WCE	4*		
507.	Solanaceae	<i>Nicandra physalodes</i> (L.) Gaertn.	Ishmagoli	Herb		840	750–2,600	WCE	5*		
508.	Solanaceae	<i>Solanum erianthum</i> D. Don	Dursul	Shrub	Huti	1,100	200–1,400	WCE	5*		
509.	Symplocaceae	<i>Symplocos paniculata</i> Miq.	Odh	Tree	Khar	2,078–2,371	1,000–2,500	WCE	4		

528.	Urticaceae	<i>Pouzolzia zeylanica</i> (L.) Benn. & R. Br.	Kanjada	Herb	Khar	2,250	200–2,400	WCE	1, 4*	
529.	Urticaceae	<i>Urtica ardens</i> Link		Herb	Chamelia Valley	2,000–2,700	600–3,200	WCE	3*	
530.	Urticaceae	<i>Urtica dioica</i> L.	Sisnu	Herb	Khar	2,150	500–4,500	WC	1, 4*	Vegetable, Medicine, Leaf, Stem, Root
531.	Verbenaceae	<i>Lantana camara</i> L.	Kirme kanda	Shrub	Kanda	1,219		WCE		
532.	Violaceae	<i>Viola biflora</i> L.	Chiphulya	Herb	Api Base, Gauchhali Ghol, Kali Dhunga, Khar, Tadhapani	2,100–4,500	2,100–4,500	WCE	2, 3, 4	Medicine, Whole plant leaf
533.	Vitaceae	<i>Ampelocissus rugosa</i> (Wall.) Planch.	Ratbelo	climber	Khar	2,190	1,000–2,400	WCE	4	
534.	Vitaceae	<i>Tetrastigma serrulatum</i> (Roxb.) Planch.	Panlauro	Climber	Chamelia Valley	2,500	500–2,400	WCE	3	
535.	Zingiberaceae	<i>Caulleya spicata</i> (Sm.) Baker		Herb	Chamelia Valley	2,000–2,200	1,800–2,800	WCE	3	

* Herbarium specimens were not collected.

†W: West; C: Central; E: East

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- 2) Ghimire, S.K. (2015). *Setting Up of Long-term GIORIA Observation Sites for Monitoring the Effects of Climate Change on Biodiversity in Api Nampa Conservation Area, Nepal*. Unpublished report submitted to KSLCD-Nepal.
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Checklist 2: Gymnosperms

SN	Family	Scientific Name	Nepali Name	Habit	Locality	Elevation (masl)		†Distribution in Nepal	References	Uses
						ANCA	Nepal			
1.	Cupressaceae	<i>Cupressus torulosa</i> D. Don	Raj salla	Tree			1,300–3,300	WC	4	Timber, Medicine
2.	Cupressaceae	<i>Juniperus indica</i> Bertol.	Dhupi	Tree			2,100–4,500	WCE	1	Ritual, Medicine
3.	Cupressaceae	<i>Juniperus pseudosabina</i> Fisch. & Mey.		Shrub	Dipukang-Api	3,200			4	
4.	Cupressaceae	<i>Juniperus squamata</i> Buch.-Ham. ex D. Don	Dhupi	Tree	Sunchera	1,800	3,000–4,500	WCE	1	Medicine, Ritual
5.	Ephedraceae	<i>Ephedra gerardiana</i> Wall. ex Stapf	Somlata	Shrub			2,000–5,200	WCE	1	
6.	Pinaceae	<i>Abies spectabilis</i> (D. Don) Spach	Gobre salla	Tree			2,400–3,800	WCE	2	Timber, Medicine
7.	Pinaceae	<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	Deodar	Tree	Kuntisau, Byas	2350	2000-2500	WC		Timber, Medicine
8.	Pinaceae	<i>Pinus macrophylla</i> D. Don		Tree	Mechhra-Kalagad		4,000–4,100		4	
9.	Pinaceae	<i>Pinus wallichiana</i> A.B. Jacks.	Gobre salla	Tree			1,800–4,300	WCE	3	Timber, Medicine
10.	Pinaceae	<i>Pinus roxburghii</i> Sarg.	Khate Sallo, Aulo Sallo	Tree	Makarigargh	1410	1100-2100	WCE	*	Timber, Medicine
11.	Pinaceae	<i>Tsuga dumosa</i> (D. Don) Eichler	Thingre salla	Tree			2,000–3,600	WCE	2, 3	Timber, Medicine
12.	Taxaceae	<i>Taxus contorta</i> Griff.	Louth salla	Tree			1,700–3,500	WC	2	Timber, Medicine

* Herbarium specimens were not collected.

†W: West; C: Central; E: East

References:

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Checklist 3: Pteridophytes

SN	Family	Scientific Name	Nepali Name	Locality	Elevation (masl)		†Distribution in Nepal	References	Uses	Parts Used
					ANCA	Nepal				
1.	Aspleniaceae	<i>Asplenium dalhousiae</i> Hook.		Khar	900–2,100			1		
2.	Aspleniaceae	<i>Asplenium trichomanes</i> L.		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950–4,100	2,000–4,000		3		
3.	Athyriaceae	<i>Athyrium cf. attenuatum</i> (Wall. ex C.B. Clarke) Tagawa		Gauchhali Ghol/Chire Dhunga	3,950–4,100	2,000–3,900		3		
4.	Athyriaceae	<i>Athyrium schimperii</i> subsp. <i>biserrulatum</i> (Christ) Fraser-Jenk.		Khar	900–2,100			1		
5.	Athyriaceae	<i>Athyrium strigosum</i> (T. Moore ex E.J. Lowe) T. Moore ex Salomon		Khar	900–2,100			1		
6.	Athyriaceae	<i>Athyrium wallichianum</i> Ching		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950–4,100	3,300–4,800		3		
7.	Athyriaceae	<i>Diplazium longifolium</i> D. Don ex T. Moore		Khar	900–2,100			1		
8.	Athyriaceae	<i>Diplazium maximum</i> (D. Don) C. Chr.		Khar	900–2,100			1		
9.	Blechnaceae	<i>Woodwardia unigenmata</i> (Makino) Nakai		Khar	900–2,100			1		
10.	Davalliaceae	<i>Katoella pulchra</i> (D. Don) Fraser-Jenk., Kandel & Pariyar		Khar	900–2,100			1		
11.	Dennstaedtiaceae	<i>Dennstaedtia appendiculata</i> (Wall. ex Hook.) J. Sm.		Khar, South of Dorpatta, North of Dumling, West of Api Himal	900–2,100	1,200–3,100	WCE	1, 2		
12.	Dennstaedtiaceae	<i>Hypolepis polypodioides</i> (Blume) Hook.		South of Dorpatta, North of Dumling, West of Api Himal	1,850	900–2,300	WCE	2		
13.	Dryopteridaceae	<i>Cyrtomium anomophyllum</i> (Zenker) Fraser-Jenk.		Khar	900–2,100			1		
14.	Dryopteridaceae	<i>Dryopteris caralli-hopei</i> Fraser-Jenk.		Khar	900–2,100			1		
15.	Dryopteridaceae	<i>Dryopteris nigropaleacea</i> (Fraser-Jenk.) Fraser-Jenk.		Khar	900–2,100			1		
16.	Dryopteridaceae	<i>Polystichum castaneum</i> (C.B. Clarke) B.K. Nayar & S. Kaur		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal, Tadapani, Api Base	3,950–4,100	3,200–4,600		3		
17.	Dryopteridaceae	<i>Polystichum duthiei</i> (C. Hope) C. Chr.		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950–4,100	4,200–4,800		3		

18.	Dryopteridaceae	<i>Polystichum obliquum</i> (D. Don) T. Moore	Khar	900-2,100			1	
19.	Dryopteridaceae	<i>Polystichum prescottianum</i> (Wall. ex Mett.) T. Moore	Above Joge Tal	3,940	2,200-4,000	WCE	1	
20.	Dryopteridaceae	<i>Polystichum cf. shensiense</i> Christ	Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3950-4,100	4,000-4,500		3	
21.	Dryopteridaceae	<i>Polystichum squarrosum</i> (D. Don) Fée	Khar	900-2,100			1	
22.	Equisetaceae	<i>Equisetum arvense</i> L. subsp. <i>diffusum</i> (D. Don) Fraser-Jenk.	Khar, North of Dumling	900-3,100	700-3,100	WCE	1, 2	
23.	Hypodematiaceae	<i>Hypodematium crenatum</i> (Forsk.) Kuhn & Decken subsp. <i>loyalii</i> Fraser-Jenk. & Khullar	Khar	900-2,100			1	
24.	Lycopodiaceae	<i>Huperzia hamiltonii</i> (Spreng.) Trevis.	Khar	900-2,100	1,500-2,500	WCE	1	
25.	Lycopodiaceae	<i>Huperzia pulcherrima</i> (Wall. ex Hook. & Grev.) Pic. Serm.	Khar	900-2,100	1,000-2,300	WCE	1	
26.	Lycopodiaceae	<i>Huperzia selago</i> (L.) Bernh. ex Schrank & Mart.	Api base, Tadhapani		2,900-4,500	WE	3	
27.	Lygodiaceae	<i>Lygodium japonicum</i> (Thunb.) Sw.	Lekam to Bitale	740-874	200-3,900	WCE	1, 2	
28.	Oleandraceae	<i>Oleandra wallichii</i> (Hook.) C. Presl	Khar	900-2,100				
29.	Ophioglossaceae	<i>Botrychium lanuginosum</i> Wall. ex Hook. & Grev.	Khar, Kasauti	900-2,430	1,500-3,100	WCE	1, 2	
30.	Ophioglossaceae	<i>Botrychium lunaria</i> (L.) Sw.	Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950-4,100	2,400-4,600	WCE	3	
31.	Ophioglossaceae	<i>Botrychium ternatum</i> (Thunb.) Sw.	Khar	900-2,100	1,800-2,800	WCE	1	
32.	Osmundaceae	<i>Osmunda claytoniana</i> L.	Bramha Lekh	3,100	1,400-3,500	WCE	2	
33.	Polypodiaceae	<i>Goniophlebium argutum</i> (Wall. ex Hook.) J. Sm.	Khar	900-2,100			1	
34.	Polypodiaceae	<i>Lepisorus scolopendrium</i> (Ching) Mehra & Bir	Khar	900-2,100			1	
35.	Polypodiaceae	<i>Loxogramme porcata</i> M.G. Price	Khar	900-2,100			1	
36.	Polypodiaceae	<i>Microsorium membranaceum</i> (D. Don) Ching	Khar	900-2,100			1	

37.	Polypodiaceae	<i>Polypodiodes lachnopus</i> (Wall. ex Hook.) Ching	Khar	900-2,100	400-2,700	WCE	2	Medicine	Root/Rhizome
38.	Polypodiaceae	<i>Pyrosia flocculosa</i> (D. Don) Ching	Khar	900-2,100	200-2,400	WCE	1, 2		
39.	Polypodiaceae	<i>Selliguea oxyloba</i> (Wall. ex Kunze) Fraser-Jenk.	Khar	900-2,100	80-1,400	WCE	2		
40.	Pteridaceae	<i>Adiantum capillus-veneris</i> L.	Likham to Bitale	700-900	400-2,700	WCE	2	Medicine	Root/Rhizome
41.	Pteridaceae	<i>Adiantum incisum</i> Forssk. subsp. incisum	Khar, Bitale to Paribagar	900-2,100, 800-1,200	200-2,400	WCE	1, 2		
42.	Pteridaceae	<i>Adiantum philippense</i> L. subsp. Philippense	Sipti to Seri	800-1,700	80-1,400	WCE	2		
43.	Pteridaceae	<i>Adiantum venustum</i> D. Don	Khar, North of Dumling, East of Kali River	900-2,100	1,800-3,600	WCE	1, 2		
44.	Pteridaceae	<i>Aleuritopteris albomarginata</i> (C.B. Clarke) Ching	Khar, North of Dumling, East of Kali River	900-2,100	600-3,700	WCE	1, 2		
45.	Pteridaceae	<i>Aleuritopteris anceps</i> (Blanf.) Panigrahi	Maikholi to Sipti	1,600-1,800	100-1,900	WC	2		
46.	Pteridaceae	<i>Aleuritopteris bicolor</i> (Roxb.) Fraser-Jenk.			100-2,600	WCE	2		
47.	Pteridaceae	<i>Pteris vittata</i> L.			60-2,100	WCE	1		
48.	Pteridaceae	<i>Pteris wallichiana</i> J. Agardh	Khayakat to Api Base	3,829-2,021	800-3000	WCE	2		
49.	Pteridaceae	<i>Aleuritopteris bicolor</i> (Roxb.) Fraser-Jenk.			100-2,600	WCE	2		
50.	Pteridaceae	<i>Aleuritopteris rufa</i> (D. Don) Ching	Paribagar to Makarigad	1,600	700-2,500	WCE	2		
51.	Pteridaceae	<i>Coniogramme affinis</i> (Wall. ex C. Presl) Hieron.	Simar to Dhaul Odar	2800-3,500	2,500-3,900	WCE	2		
52.	Pteridaceae	<i>Cryptogramma brunoniana</i> Wall. ex Hook. & Grev.	Chheti to Mechchra, Joge Tal	3,250-4,000	3,200-4,700	WCE	2		
53.	Pteridaceae	<i>Cryptogramma stelleri</i> (S.G. Gmel.) Pranti	Chheti to Mechchra, Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal, Tadapani, Api Base	3,250	3,200-4,600	WCE	2, 3		
54.	Pteridaceae	<i>Onychium vermae</i> Fraser-Jenk. & Khullar	Khar, North of Dumling, East of Kali River	900-2,100	1,300-2,100	WC	1, 2		
55.	Pteridaceae	<i>Pteris aspericaulis</i> Wall. ex J. Agardh	Khar, Maikhola to Sipti, Khayakat to Api Base	900-3,900	700-3,900	WCE	1, 2		
56.	Pteridaceae	<i>Pteris cretica</i> L. subsp. Cretica	Khar	900-2,100	2,000-3,400	WCE	1		

57.	Pteridaceae	<i>Pteris subquinata</i> Wall. ex J. Agardh		Khar, East of Kali River	860–2,100	300–2,800	WCE	1, 2	
58.	Pteridaceae	<i>Pteris terminalis</i> Wall. ex J. Agardh		Khar, North of Dumling, East of Kali River	900–2,100	1,500–2,700	WCE	1, 2	
59.	Pteridaceae	<i>Pteris vittata</i> L.		Lekham to Bitale	700–900	100–3,000	WCE	2	
60.	Pteridaceae	<i>Pteris wallichiana</i> J. Agardh		Khar, Khayakot to Api Base	900–3,900	2,000–3,900	WCE	1, 2	
61.	Selaginellaceae	<i>Selaginella bryopteris</i> (L.) Baker		Maikholi to Sipti	1,600–1,800	400–1,800	WCE	2	
62.	Selaginellaceae	<i>Selaginella chrysocaulos</i> (Hook. & Grev.) Spring		South of Dorpatta, North of Dumling, Api Himnal base, East of Kali River	1,850	1,300–2,900	WCE	2	
63.	Selaginellaceae	<i>Selaginella involvens</i> (Sw.) Spring		Paribagar to Makarigad	1,100–1,500	1,000–2,500	WCE	2	
64.	Selaginellaceae	<i>Selaginella pulvinata</i> (Hook. & Grev.) Maxim.		Makarigad to Khandeshwori	2,000	1,700–2,100	W	2	
65.	Selaginellaceae	<i>Selaginella subdiaphana</i> (Wall. ex Hook. & Grev.) Spring		Khar, Darchula	900–2,100	400–2,300	WCE	1, 2	
66.	Thelypteridaceae	<i>Pronephrium penangianum</i> (Hook.) Holtt.		Khar	900–2,100			1	
67.	Thelypteridaceae	<i>Pseudocyclosorus canus</i> (Bak.) Holtt. & Grimes		Khar	900–2,100			1	
68.	Woodsiaceae	<i>Woodsia alpina</i> (Bolton) Gray		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal, Tadapani, Api Base	3,950–4100	2,700–4,200		3	
69.	Woodsiaceae	<i>Woodsia hancockii</i> Baker		Kali Dhunga Tal	4,100	4,000–4,200		3	

1W: West; C: Central; E: East

References:

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- Ghimire, S.K. (2015). *Setting Up of Long-term GLORIA Observation Sites for Monitoring the Effects of Climate Change on Biodiversity in Api-Nampa Conservation Area, Nepal*. Unpublished report submitted to KSLCD-Nepal.

Checklist 4: Fungi and Lichens

SN	Family	Latin Name	Local Name	Locality	Elevation (masl)		Distribution in Nepal	References	Uses	Parts Used
					ANCA	Nepal				
1.	Agaricaceae	<i>Lycoperdon perlatum</i> Pers.		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950-4,100	Nepal	WCE	1		
2.	Morchellaceae	<i>Morchella conica</i>	Guchi Chyau				WCE	*	Vegetable, Medicine	
3.	Ophiocordycipitaceae	<i>Ophiocordyceps sinensis</i> (Berk.) G.H. Sung, Hywel-Jones & Spatafora	Yarisagumbu, Yartsa gunbu, Jeevanbuti	Tadhapani	4,300		WCE	1	Medicine	Whole plant
4	Usneaceae	<i>Thamnolia vermicularis</i> (Sw.) Schaer.		Gauchhali Ghol/Chire Dhunga, Kali Dhunga Tal	3,950-4,100		WCE	1		

* Herbarium specimens were not collected.

†W: West; C: Central; E: East

References:

- Ghimire, S.K. (2015). *Setting Up of Long-term GLORIA Observation Sites for Monitoring the Effects of Climate Change on Biodiversity in Api-Nampa Conservation Area, Nepal*. Unpublished report submitted to KSLCI-Nepal.



Photo: The Himalayan musk deer (above) and ghoral (below) captured by camera trap in ANCA (Credit: ANCA Office)

Checklist 5: Mammals

SN	Family	Scientific Name	Common Name	Nepali Name*	References
1.	Ailuridae	<i>Ailurus fulgens</i> F.G. Cuvier, 1825**	Red panda	Habre	1, 6
2.	Bovidae	<i>Hemitragus jemlahicus</i> (C.H. Smith, 1826)	Himalayan tahr	Jharal	1, 4, 5, 6
3.	Bovidae	<i>Naemorhedus goral</i> (Hardwicke, 1825)	Goral	Ghoral	1, 5, 6
4.	Bovidae	<i>Pseudois nayaur</i> (Hodgson, 1833)	Blue sheep	Naur	4, 5
5.	Canidae	<i>Canis aureus</i> Linnaeus, 1758	Golden jackal	Syal	1, 5, 6
6.	Canidae	<i>Canis lupus</i> Linnaeus, 1758	Grey wolf	Bwaso	1
7.	Canidae	<i>Vulpes vulpes</i> (Linnaeus, 1758)	Red fox	Rato phyauro	5
8.	Caprinae	<i>Capricornis thar</i> Hodgson, 1831	Himalayan serow	Thar	1, 5, 6
9.	Cercopithecidae	<i>Macaca mulatta</i> (Zimmermann, 1780)	Rhesus macaque	Baandar	5
10.	Cercopithecidae	<i>Macaca assamensis</i> (M'Clelland, 1840)	Assam macaque	Pahare baandar	7
11.	Cercopithecidae	<i>Semnopithecus entellus</i> (Dufresne, 1797)	Common langur	Langur	1
12.	Cervidae	<i>Muntiacus vaginalis</i> (Boddaert, 1758)	Barking deer	Ratuwa, Rate	5, 6
13.	Felidae	<i>Felis chaus</i> Schreber, 1777	Jungle cat	Ban biralo	5
14.	Felidae	<i>Neofelis nebulosa</i> (Griffith, 1821)	Clouded leopard	Dhwase chituwa	6
15.	Felidae	<i>Panthera pardus</i> (Schlegel, 1857)	Common leopard	Chituwa	5, 8
16.	Felidae	<i>Panthera uncia</i> (Schreber, 1775)	Snow leopard	Hiu chituwa	1, 5
17.	Felidae	<i>Felis temminckii</i> Vigors & Horsfield, 1827	Asiatic golden cat	Sunaulo biralo	5
18.	Felidae	<i>Prionailurus bengalensis</i> (Kerr, 1792)	Leopard cat	Chari bagh	5
19.	Hystricidae	<i>Hystrix indica</i> Kerr, 1792	Porcupine	Dumsi	5
20.	Moschidae	<i>Moschus chrysogaster</i> (Hodgson, 1939)	Himalayan musk deer	Kasturi mirga	1, 2, 3, 5, 6
21.	Muridae	<i>Bandicota bengalensis</i> (Gray, 1835)	Lesser bandicoot rat	Sano dhademuso	5
22.	Muridae	<i>Rattus rattus</i> (Linnaeus, 1758)	House rat	Ghar muso	5
23.	Muridae	<i>Rattus nitidus</i> (Hodgson, 1845)	Himalayan field rat	Himali khet muso	5
24.	Muridae	<i>Rattus norvegicus</i> (Berkenhout, 1769)	Brown rat	Kairo muso	5
25.	Mustelidae	<i>Lutra lutra</i> (Linnaeus, 1758)	Eurasian otter	Kalo oat	5,6
26.	Mustelidae	<i>Martes flavigula</i> (Boddaert, 1785)	Yellow-throated marten	Malsapro	5
27.	Mustelidae	<i>Martes foina</i> (Erxleben, 1777)	Beech marten	Himali malsapro	5
28.	Mustelidae	<i>Mustela altaica</i> Pallas, 1811	Mountain weasel	Pahadi malsapro	5
29.	Ochotonidae	<i>Ochotona macrotis</i> (Gunther, 1875)	Large-eared pika	Lamkane thute kharaya	5
30.	Ochotonidae	<i>Ochotona nubrica</i> Thomas, 1922	Nubra pika	Nubri thute kharaya	5
31.	Ochotonidae	<i>Ochotona roylei</i> (Ogilby, 1839)	Royle's pika	Muse thute kharaya	8
32.	Sciuridae	<i>Hylopetes alboniger</i> (Hodgson, 1836)	Particolored flying squirrel	Male rajpankhi lokharke	5
33.	Sciuridae	<i>Marmota bobak</i> Muller, 1776	Bobak marmot	Phyau muso	5
34.	Sciuridae	<i>Marmota himalayana</i> (Hodgson, 1841)	Himalayan marmot	Himali phyau muso	5
35.	Sciuridae	<i>Petaurista magnificus</i> (Hodgson, 1836)	Hodgson's giant flying squirrel	Sundar rajpankhi lokharke	5
36.	Sciuridae	<i>Tamiops maccllellandii</i> (Horsfield, 1840)	Himalayan striped squirrel	Himali dharke lokharke	5
37.	Soricidae	<i>Suncus murinus</i> Linnaeus, 1766	Asian house shrew	Ghar chhuchundro	5
38.	Soricidae	<i>Soriculus nigrescens</i> (Gray, 1842)	Himalayan shrew	Himali chhuchundro	5
39.	Suidae	<i>Sus scrofa</i> Linnaeus, 1758	Wild boar	Badel	5
40.	Ursidae	<i>Ursus thibetanus</i> Cuvier, 1823	Himalayan black bear	Himali kaalo bhalu	1, 5, 6
41.	Vespertilionidae	<i>Barbastella leucomelas</i> Cretzschmar, 1826	Eastern barbastelle	Purwiya Himali chamero	5
42.	Viverridae	<i>Viverra zibetha</i> Linnaeus, 1758	Large Indian civet	Thulo nir biralo	5
43.	Viverridae	<i>Viverricula indica</i> Geoffroy Saint-Hilaire, 1803	Small Indian civet	Sano nir biralo	5

* Local names from Baral, H.S., and Shah, K.B. (2008). Wild Mammals of Nepal. Kathmandu: Himalayan Nature.

** Potential presence noted, but actual sighting not reported.

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Photo: Assam macaque is a protected species in Nepal (Credit: Mukesh K. Chalise)

Checklist 6: Birds

SN	Order	Family	Scientific Name	Common Name	Nepali Name	References
1.	Anseriformes	Anatidae	<i>Mergus merganser</i>	Common merganser	Manitundak	1, 2
2.	Apodiformes	Apodidae	<i>Apus affinis</i>	House swift	Firfire ghar gaunthali	1, 2
3.	Apodiformes	Apodidae	<i>Apus pacificus</i>	Fork-tailed swift	Puccharkape gaunthali	1, 2
4.	Apodiformes	Apodidae	<i>Collocalia brevirostris</i>	Himalayan swiftlet	Chinchika gaunthali	1, 2
5.	Apodiformes	Apodidae	<i>Tachymarptis melba</i>	Alpine swift	Batasi gaunthali	1, 2
6.	Bucerotiiformes	Upupidae	<i>Upupa epops</i>	Common hoopoe	Fapre chara	1, 2
7.	Ciconiiformes	Accipitridae	<i>Accipiter badius</i>	Shikra	Shikra	1, 2
8.	Ciconiiformes	Accipitridae	<i>Accipiter gentilis</i>	Northern goshawk		1, 2
9.	Ciconiiformes	Accipitridae	<i>Accipiter nisus</i>	Eurasian sparrowhawk	Banbaaj	1, 2
10.	Ciconiiformes	Accipitridae	<i>Accipiter trivirgatus</i>	Crested goshawk	Kalki basera	1, 2
11.	Ciconiiformes	Accipitridae	<i>Accipiter virgatus</i>	Besra	Besra	2
12.	Ciconiiformes	Accipitridae	<i>Aegypius monachus</i>	Cinereous vulture	Raj giddha	1, 2
13.	Ciconiiformes	Accipitridae	<i>Aquila chrysaetos</i>	Golden eagle	Suparna mahachil	1, 2
14.	Ciconiiformes	Accipitridae	<i>Aquila nipalensis</i>	Steppe eagle	Gomayu mahachil	1, 2
15.	Ciconiiformes	Accipitridae	<i>Buteo (buteo) burmanicus</i>	Himalayan buzzard	Himali shayanbaj	2
16.	Ciconiiformes	Accipitridae	<i>Buteo buteo</i>	Common buzzard	Shayanbaj	1
17.	Ciconiiformes	Accipitridae	<i>Buteo hemilasius</i>	Upland buzzard	Pahadi shayanbaj	1, 2
18.	Ciconiiformes	Accipitridae	<i>Buteo rufinus</i>	Long-legged buzzard	Lamkhutte shayanbaj	1, 2
19.	Ciconiiformes	Accipitridae	<i>Gypaetus barbatus</i>	Lammergeier	Haadfor	1, 2
20.	Ciconiiformes	Accipitridae	<i>Gyps bengalensis</i>	White-rumped vulture	Dangar giddha	1, 2
21.	Ciconiiformes	Accipitridae	<i>Gyps fulvus</i>	Eurasian griffon	Khairo giddha	1
22.	Ciconiiformes	Accipitridae	<i>Gyps himalayensis</i>	Himalayan griffon	Himali giddha	1, 2
23.	Ciconiiformes	Accipitridae	<i>Ictinaetus malayensis</i>	Black eagle	Dronak chil	1, 2
24.	Ciconiiformes	Accipitridae	<i>Milvus migrans</i>	Black kite	Kalo chil	1, 2
25.	Ciconiiformes	Accipitridae	<i>Neophron percnopterus</i>	Egyptian vulture	Seto chil	1, 2
26.	Ciconiiformes	Accipitridae	<i>Sarcogyps calvus</i>	Red-headed vulture	Sun giddha	1, 2
27.	Ciconiiformes	Accipitridae	<i>Spilornis cheela</i>	Crested serpent eagle	Kakakul	1, 2
28.	Ciconiiformes	Accipitridae	<i>Spizaetus nipalensis</i>	Mountain hawk eagle	Pahadi shadalchil	2
29.	Ciconiiformes	Falconidae	<i>Falco tinnunculus</i>	Common kestrel	Baundai	1, 2
30.	Ciconiiformes	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great cormorant	Jaletra	1, 2
31.	Columbiformes	Columbidae	<i>Chalcophaps indica</i>	Emerald dove	Haril dhukur	1, 2
32.	Columbiformes	Columbidae	<i>Columba leuconota</i>	Snow pigeon	Himali malewa	1, 2
33.	Columbiformes	Columbidae	<i>Columba livia</i>	Rock pigeon	Malewa	1, 2
34.	Columbiformes	Columbidae	<i>Columba rupestris</i>	Hill pigeon	Lekali malewa	1, 2
35.	Columbiformes	Columbidae	<i>Streptopelia chinensis</i>	Spotted dove	Kule dhukur	1, 2
36.	Columbiformes	Columbidae	<i>Streptopelia decaocto</i>	Eurasian collared dove	Kanthey dhukur	1, 2
37.	Columbiformes	Columbidae	<i>Streptopelia orientalis</i>	Oriental turtle dove	Tamey dhukur	1, 2
38.	Coraciiformes	Alcedinidae	<i>Alcedo atthis</i>	Common kingfisher	Sano matikore	2
39.	Coraciiformes	Cerylidae	<i>Megaceryle lugubris</i>	Crested kingfisher		1
40.	Coraciiformes	Alcedinidae	<i>Halcyon smyrnensis</i>	White-throated kingfisher		1
41.	Cuculiformes	Cuculidae	<i>Cuculus saturatus</i>	Oriental cuckoo	Purbiya koili	1, 2
42.	Cuculiformes	Cuculidae	<i>Hierococcyx sparverioides</i>	Large hawk cuckoo		1, 2
43.	Galliformes	Phasianidae	<i>Alectoris chukar</i>	Chukar	Chukar	1, 2
44.	Galliformes	Phasianidae	<i>Arborophila torqueola</i>	Hill partridge	Piura	1, 2
45.	Galliformes	Phasianidae	<i>Catreus wallichii</i>	Cheer pheasant	Cheer	1, 2

46.	Galliformes	Phasianidae	<i>Francolinus francolinus</i>	Black francolin	Kalo titra	1, 2
47.	Galliformes	Phasianidae	<i>Lophophorus impejanus</i>	Himalayan monal	Danphe	1, 2
48.	Galliformes	Phasianidae	<i>Lophura leucomelanos</i>	Kalij pheasant	Kalij	1, 2
49.	Galliformes	Phasianidae	<i>Pucrasia macrolopha</i>	Koklass pheasant	Phokras	1, 2
50.	Galliformes	Phasianidae	<i>Tragopan satyra</i>	Satyr tragopan	Munal	1, 2
51.	Passeriformes	Aegithalidae	<i>Aegithalos concinnus</i>	Black-throated tit	Kalikanthe rajchichilkote	1, 2
52.	Passeriformes	Aegithalidae	<i>Aegithalos niveogularis</i>	White-throated tit	Setokanthe rajchichilkote	1, 2
53.	Passeriformes	Campephagidae	<i>Coracina melaschistos</i>	Black-winged cuckooshrike	Kalo birahichari	1, 2
54.	Passeriformes	Certhiidae	<i>Certhia familiaris</i>	Eurasian treecreeper		1
55.	Passeriformes	Certhiidae	<i>Certhia himalayana</i>	Bar-tailed treecreeper	Puccharpate cheypare chari	1, 2
56.	Passeriformes	Certhiidae	<i>Certhia hodgsoni</i>	Hodgson's treecreeper	Seto pate cheypare chari	2
57.	Passeriformes	Certhiidae	<i>Certhia nipalensis</i>	Rusty-flanked treecreeper	Kailokokhey cheypare chari	1, 2
58.	Passeriformes	Certhiidae	<i>Troglodytes troglodytes</i>	Winter wren	Chitri	1, 2
59.	Passeriformes	Cinclidae	<i>Cinclus pallasii</i>	Brown dipper		1, 2
60.	Passeriformes	Cisticolidae	<i>Prinia criniger</i>	Striated prinia		1, 2
61.	Passeriformes	Cisticolidae	<i>Prinia hodgsonii</i>	Grey-breasted prinia	Fusreachaati ghasey fisto	1, 2
62.	Passeriformes	Corvidae	<i>Corvus macrorhynchos</i>	Large-billed crow	Kalo kaag	1, 2
63.	Passeriformes	Corvidae	<i>Corvus splendens</i>	House crow	Ghar kaag	1, 2
64.	Passeriformes	Corvidae	<i>Dendrocitta formosae</i>	Grey treepie	Pahadi kokale	1, 2
65.	Passeriformes	Corvidae	<i>Dendrocitta vagabunda</i>	Rufous treepie	Kokale	2
66.	Passeriformes	Corvidae	<i>Garrulus glandarius</i>	Eurasian jay	Kaile ban kaag	1, 2
67.	Passeriformes	Corvidae	<i>Garrulus lanceolatus</i>	Black-headed jay	Kalotauke ban kaag	1, 2
68.	Passeriformes	Corvidae	<i>Nucifraga caryocatactes</i>	Spotted nutcracker	Bansarra	1, 2
69.	Passeriformes	Corvidae	<i>Pericrocotus brevirostris</i>	Short-billed minivet	Laghudhude ranichari	1, 2
70.	Passeriformes	Corvidae	<i>Pericrocotus ethologus</i>	Long-tailed minivet	Lampuchhre ranichari	1, 2
71.	Passeriformes	Corvidae	<i>Pericrocotus flammeus</i>	Scarlet minivet	Ranichari	1, 2
72.	Passeriformes	Corvidae	<i>Pyrrhonorax pyrrhonorax</i>	Red-billed chough	Tunga	2
73.	Passeriformes	Corvidae	<i>Rhipidura albicollis</i>	White-throated fantail		1
74.	Passeriformes	Corvidae	<i>Rhipidura aureola</i>	White-throated fantail	Nakkale marunichari	2
75.	Passeriformes	Corvidae	<i>Rhipidura hypoxantha</i>	Yellow-bellied fantail	Pahelo marunichari	1, 2
76.	Passeriformes	Corvidae	<i>Terpsiphone paradisi</i>	Asian paradise flycatcher		1, 2
77.	Passeriformes	Corvidae	<i>Urocissa erythrorhyncha</i>	Red-billed blue magpie	Syal pothari laampuchar	1, 2
78.	Passeriformes	Corvidae	<i>Urocissa flavirostris</i>	Yellow-billed blue magpie	Sun thunde laampuchar	1, 2
79.	Passeriformes	Dicaeidae	<i>Dicaeum ignipectus</i>	Fire-breasted flowerpecker	Agniwakshya puspakokil	1, 2
80.	Passeriformes	Dicruridae	<i>Dicrurus aeneus</i>	Bronzed drongo	Sano chibey	1, 2
81.	Passeriformes	Dicruridae	<i>Dicrurus hottentottus</i>	Spangled drongo	Keshraj chibey	2
82.	Passeriformes	Dicruridae	<i>Dicrurus leucophaeus</i>	Ashy drongo	Dhuwanse chibey	1, 2
83.	Passeriformes	Dicruridae	<i>Dicrurus macrocercus</i>	Black drongo	Kalo chibey	1, 2
84.	Passeriformes	Fringillidae	<i>Carduelis spinoides</i>	Yellow-breasted greenfinch	Gaajale peet chari	1, 2

85.	Passeriformes	Fringillidae	<i>Carpodacus edwardsii</i>	Dark-rumped rosefinch		1
86.	Passeriformes	Fringillidae	<i>Carpodacus erythrinus</i>	Common rosefinch	Omanga titu	2
87.	Passeriformes	Fringillidae	<i>Carpodacus nipalensis</i>	Dark-breasted rosefinch	Nepal titu	1, 2
88.	Passeriformes	Fringillidae	<i>Carpodacus pulcherrimus</i>	Himalayan beautiful rosefinch	Jhibi titu	2
89.	Passeriformes	Fringillidae	<i>Carpodacus rodochroa</i>	Pink-browed rosefinch	Rato jhibi titu	1, 2
90.	Passeriformes	Fringillidae	<i>Carpodacus rodopeplus</i>	Spot-winged rosefinch	Pankha thople titu	1, 2
91.	Passeriformes	Fringillidae	<i>Carpodacus rubicilloides</i>	Streaked rosefinch		1
92.	Passeriformes	Fringillidae	<i>Carpodacus thura</i>	Himalayan white-browed rosefinch	Pankha thople thulo titu	2
93.	Passeriformes	Fringillidae	<i>Emberiza cia</i>	Rock bunting	Shila bagedi	1, 2
94.	Passeriformes	Fringillidae	<i>Emberiza leucocephalos</i>	Pine bunting	Salle bagedi	1, 2
95.	Passeriformes	Fringillidae	<i>Fringilla coelebs</i>	Chaffinch	Chitrakachari	1, 2
96.	Passeriformes	Fringillidae	<i>Fringilla montifringilla</i>	Brambling	Kalo tauke chitraka chari	2
97.	Passeriformes	Fringillidae	<i>Haematospiza sipahi</i>	Scarlet finch		1
98.	Passeriformes	Fringillidae	<i>Leucosticte nemoricola</i>	Plain mountain finch	Titu bhangeyra	1, 2
99.	Passeriformes	Fringillidae	<i>Melophus lathami</i>	Crested bunting	Jurey bageydi	1, 2
100.	Passeriformes	Fringillidae	<i>Mycerobas affinis</i>	Collared grosbeak	Suntale mahadhund	2
101.	Passeriformes	Fringillidae	<i>Mycerobas carripes</i>	White-winged grosbeak	Dhupi mahadhund	1
102.	Passeriformes	Fringillidae	<i>Mycerobas icterioides</i>	Black-and-yellow grosbeak	Peet krishna mahadhund	2
103.	Passeriformes	Fringillidae	<i>Mycerobas melanozanthos</i>	Spot-winged grosbeak	Pankha thople mahadhund	1
104.	Passeriformes	Fringillidae	<i>Pinicola subhimachalus</i>	Crimson-browed finch		1
105.	Passeriformes	Fringillidae	<i>Pyrhula erythrocephala</i>	Red-headed bullfinch	Ratotaue tiuntiun	1, 2
106.	Passeriformes	Fringillidae	<i>Pyrhula nipalensis</i>	Brown bullfinch	Khairo tiuntiun	1, 2
107.	Passeriformes	Hirundinidae	<i>Delichon dasypus</i>	Asian house martin	Asiyali bheer gaunthali	1, 2
108.	Passeriformes	Hirundinidae	<i>Delichon nipalensis</i>	Nepal house martin	Nepal bhir gaunthali	1, 2
109.	Passeriformes	Hirundinidae	<i>Hirundo daurica</i>	Red-rumped swallow	Gorukati gaunthali	1, 2
110.	Passeriformes	Hirundinidae	<i>Ptyonoprogne rupestris</i>	Eurasian crag martin	Nahikuti gaunthali	1, 2
111.	Passeriformes	Laniidae	<i>Lanius cristatus</i>	Brown shrike		1, 2
112.	Passeriformes	Laniidae	<i>Lanius schach</i>	Long-tailed shrike	Bhadrai	1, 2
113.	Passeriformes	Laniidae	<i>Lanius tephronotus</i>	Grey-backed shrike	Himali bhadrayo	1, 2
114.	Passeriformes	Muscicapidae	<i>Chaimarrornis leucocephalus</i>	White-capped water redstart	Setotaue jalkhanjari	1, 2
115.	Passeriformes	Muscicapidae	<i>Copsychus saularis</i>	Oriental magpie robin	Dhobini chara	1, 2
116.	Passeriformes	Muscicapidae	<i>Culicicapa ceylonensis</i>	Grey-headed canary flycatcher	Chanchale arjunak	1, 2
117.	Passeriformes	Muscicapidae	<i>Cyornis banyumas</i>	Hill blue flycatcher		1
118.	Passeriformes	Muscicapidae	<i>Enicurus maculatus</i>	Spotted forktail	Thople kholedhobini	1, 2
119.	Passeriformes	Muscicapidae	<i>Enicurus schistaceus</i>	Slaty-backed forktail	Fusrodhade kholedhobini	1, 2
120.	Passeriformes	Muscicapidae	<i>Enicurus scouleri</i>	Little forktail	Ganga kholedhobini	1, 2
121.	Passeriformes	Muscicapidae	<i>Eumyias thalassina</i>	Verditer flycatcher	Nilutho arjunak	1, 2
122.	Passeriformes	Muscicapidae	<i>Ficedula strophitata</i>	Rufous-gorgeted flycatcher	Setotike arjunak	1, 2
123.	Passeriformes	Muscicapidae	<i>Ficedula superciliaris</i>	Ultramarine flycatcher		1, 2
124.	Passeriformes	Muscicapidae	<i>Ficedula tricolor</i>	Slaty-blue flycatcher	Tiktike arjunak	1, 2

125.	Passeriformes	Muscicapidae	<i>Ficedula westermanni</i>	Little pied flycatcher	Shyamshwet arjunak	1, 2
126.	Passeriformes	Muscicapidae	<i>Muscicapa ruficauda</i>	Rusty-tailed flycatcher	Kalopucchre arjunak	1, 2
127.	Passeriformes	Muscicapidae	<i>Muscicapa sibirica</i>	Dark-sided flycatcher	Dhuwanse arjunak	1, 2
128.	Passeriformes	Muscicapidae	<i>Niltava grandis</i>	Large niltava		1
129.	Passeriformes	Muscicapidae	<i>Niltava macgrigoriae</i>	Small niltava	Sano niltabha	2
130.	Passeriformes	Muscicapidae	<i>Niltava sundara</i>	Rufous-bellied niltava	Sundar niltabha	1, 2
131.	Passeriformes	Muscicapidae	<i>Phoenicurus coeruleocephalus</i>	Blue-capped redstart	Dhobini khanjar	1, 2
132.	Passeriformes	Muscicapidae	<i>Phoenicurus frontalis</i>	Blue-fronted Redstart	Niltauke khanjar	1, 2
133.	Passeriformes	Muscicapidae	<i>Phoenicurus hodgsoni</i>	Hodgson's Redstart	Tankampa khanjar	1, 2
134.	Passeriformes	Muscicapidae	<i>Phoenicurus schisticeps</i>	White-throated redstart	Setokanthe khanjar	1, 2
135.	Passeriformes	Muscicapidae	<i>Rhyacornis fuliginosus</i>	Plumbeous water redstart	Nilambar jalkhanjar	1, 2
136.	Passeriformes	Muscicapidae	<i>Saxicola caprata</i>	Pied bushchat	Kale jhyapsi	1, 2
137.	Passeriformes	Muscicapidae	<i>Saxicola ferrea</i>	Grey bushchat		1
138.	Passeriformes	Muscicapidae	<i>Saxicola torquata</i>	Common stonechat	Jhakejhake jhyapsi	1, 2
139.	Passeriformes	Muscicapidae	<i>Tarsiger chrysaesus</i>	Golden bush robin	Sunalo rabin	1, 2
140.	Passeriformes	Muscicapidae	<i>Tarsiger cyanurus</i>	Orange-flanked bush robin	Suntala khale rabin	1, 2
141.	Passeriformes	Nectariniidae	<i>Aethopyga gouldiae</i>	Mrs Gould's sunbird	Kanti bungeychara	1, 2
142.	Passeriformes	Nectariniidae	<i>Aethopyga ignicauda</i>	Fire-tailed sunbird	Laampucchre bungeychara	1, 2
143.	Passeriformes	Nectariniidae	<i>Aethopyga nipalensis</i>	Green-tailed sunbird	Nepal bungeychara	1, 2
144.	Passeriformes	Nectariniidae	<i>Aethopyga saturata</i>	Black-throated sunbird	Kali kantha bungeychara	1, 2
145.	Passeriformes	Nectariniidae	<i>Aethopyga siparaja</i>	Crimson sunbird	Sipraja bungeychara	1, 2
146.	Passeriformes	Nectariniidae	<i>Nectarinia asiatica</i>	Purple sunbird	Kalo bungeychara	1, 2
147.	Passeriformes	Oriolidae	<i>Oriolus traillii</i>	Maroon oriole	Ghan rakta sunchar	1, 2
148.	Passeriformes	Paridae	<i>Parus ater</i>	Coal tit	Sano fusre chichilkote	1, 2
149.	Passeriformes	Paridae	<i>Parus dichrous</i>	Grey-crested tit	Fussrojure chicilkote	1, 2
150.	Passeriformes	Paridae	<i>Parus major</i>	Great tit	Chichilkote	1, 2
151.	Passeriformes	Paridae	<i>Parus melanolophus</i>	Spot-winged tit		1
152.	Passeriformes	Paridae	<i>Parus monticolus</i>	Green-backed tit	Hariyo chachilkote	1, 2
153.	Passeriformes	Paridae	<i>Parus rubidiventris</i>	Rufous-vented tit		1, 2
154.	Passeriformes	Paridae	<i>Parus rufonuchalis</i>	Rufous-naped tit	Kalo gardaney chachilkote	1, 2
155.	Passeriformes	Paridae	<i>Parus xanthogenys</i>	Black-lored tit	Pandu chachilkote	1, 2
156.	Passeriformes	Paridae	<i>Sylviparus modestus</i>	Yellow-browed tit	Chanduwa chachilkote	1, 2
157.	Passeriformes	Passeridae	<i>Anthus hodgsoni</i>	Olive-backed pipit	Rukh chuiya	1, 2
158.	Passeriformes	Passeridae	<i>Anthus roseatus</i>	Rosy pipit	Gulafi kanthe chuiya	1, 2
159.	Passeriformes	Passeridae	<i>Anthus rufulus</i>	Paddyfield pipit	Aali chuiya	1, 2
160.	Passeriformes	Passeridae	<i>Anthus sylvanus</i>	Upland pipit	Pahadi chuiya	1, 2
161.	Passeriformes	Passeridae	<i>Anthus trivialis</i>	Tree pipit	Bagale chuiya	1, 2
162.	Passeriformes	Passeridae	<i>Lonchura striata</i>	White-rumped munia	Setodhade muniya	1, 2
163.	Passeriformes	Passeridae	<i>Motacilla alba</i>	White wagtail	Seto tiktike	1, 2
164.	Passeriformes	Passeridae	<i>Motacilla cinerea</i>	Grey wagtail	Fusro tiktike	1, 2
165.	Passeriformes	Passeridae	<i>Motacilla flava</i>	Yellow wagtail	Pahelo tiktike	1, 2
166.	Passeriformes	Passeridae	<i>Motacilla maderaspatensis</i>	White-browed wagtail	Kholey tiktike	1, 2
167.	Passeriformes	Passeridae	<i>Passer domesticus</i>	House sparrow	Ghar bhanger	1, 2
168.	Passeriformes	Passeridae	<i>Passer montanus</i>	Eurasian tree sparrow	Rukh bhanger	1, 2
169.	Passeriformes	Passeridae	<i>Passer rutilans</i>	Russet sparrow	Kailo bhanger	1, 2

170.	Passeriformes	Passeridae	<i>Prunella atrogularis</i>	Black-throated accentor		1, 2
171.	Passeriformes	Passeridae	<i>Prunella collaris</i>	Alpine accentor		1, 2
172.	Passeriformes	Passeridae	<i>Prunella rubeculoides</i>	Robin accentor		1, 2
173.	Passeriformes	Passeridae	<i>Prunella strophhiata</i>	Rufous-breasted accentor		1, 2
174.	Passeriformes	Pycnonotidae	<i>Cisticola juncidis</i>	Zitting cisticola	Firfire	1, 2
175.	Passeriformes	Pycnonotidae	<i>Hypsipetes leucocephalus</i>	Black bulbul	Bakhre jureli	1, 2
176.	Passeriformes	Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented bulbul	Jureli	1, 2
177.	Passeriformes	Pycnonotidae	<i>Pycnonotus leucogenys</i>	Himalayan bulbul	Julfe jureli	1, 2
178.	Passeriformes	Regulidae	<i>Regulus regulus</i>	Goldcrest		2
179.	Passeriformes	Sittidae	<i>Sitta cashmirensis</i>	Kashmir nuthatch	Kashmiri matta	1, 2
180.	Passeriformes	Sittidae	<i>Sitta castanea</i>	Chestnut-bellied nuthatch	Katuse matta	1, 2
181.	Passeriformes	Sittidae	<i>Sitta frontalis</i>	Velvet-fronted nuthatch	Makhmali matta	1
182.	Passeriformes	Sittidae	<i>Sitta himalayensis</i>	White-tailed nuthatch	Pahadi matta	1, 2
183.	Passeriformes	Sittidae	<i>Sitta leucopsis</i>	White-cheeked nuthatch	Kalotauke matta	1
184.	Passeriformes	Sittidae	<i>Tichodroma muraria</i>	Wallcreeper	Murari putalichara	1
185.	Passeriformes	Sturnidae	<i>Acridotheres tristis</i>	Common myna	Dangre rupee	1, 2
186.	Passeriformes	Sylviidae	<i>Abroscopus schisticeps</i>	Black-faced warbler	Gaajale fisto	1, 2
187.	Passeriformes	Sylviidae	<i>Actinodura egertoni</i>	Rusty-fronted barwing		1
188.	Passeriformes	Sylviidae	<i>Alcippe vinipectus</i>	White-browed fulvetta	Peetnayan fulbutta	1, 2
189.	Passeriformes	Sylviidae	<i>Cettia brunnifrons</i>	Grey-sided bush warbler	Ratotauke jhadi fisto	1, 2
190.	Passeriformes	Sylviidae	<i>Cettia flavivivea</i>	Aberrant bush warbler	Pitharit jhadi fisto	1, 2
191.	Passeriformes	Sylviidae	<i>Conostoma oemodium</i>	Great parrotbill	Chandey bandarchari	1, 2
192.	Passeriformes	Sylviidae	<i>Cutia nipalensis</i>	Himalayan cutia	Cutiya	1
193.	Passeriformes	Sylviidae	<i>Garrulax albogularis</i>	White-throated laughingthrush	Soiraney tori ganda	1, 2
194.	Passeriformes	Sylviidae	<i>Garrulax caeruleus</i>	Grey-sided laughingthrush		1
195.	Passeriformes	Sylviidae	<i>Garrulax erythrocephalus</i>	Chestnut-crowned laughingthrush	Katusatauke tori ganda	1, 2
196.	Passeriformes	Sylviidae	<i>Garrulax leucolophus</i>	White-crested laughingthrush	Hiunjure tori ganda	1, 2
197.	Passeriformes	Sylviidae	<i>Garrulax lineatus</i>	Streaked laughingthrush	Chirkey tori ganda	1, 2
198.	Passeriformes	Sylviidae	<i>Garrulax ocellatus</i>	Spotted laughingthrush	Mundale tori ganda	1, 2
199.	Passeriformes	Sylviidae	<i>Garrulax striatus</i>	Striated laughingthrush	Kalki tori ganda	1, 2
200.	Passeriformes	Sylviidae	<i>Garrulax subunicolor</i>	Scaly laughingthrush		1
201.	Passeriformes	Sylviidae	<i>Garrulax variegatus</i>	Variiegated laughingthrush	Tikiyuri tori ganda	1, 2
202.	Passeriformes	Sylviidae	<i>Heterophasia capistrata</i>	Rufous sibia	Sibiya	1, 2
203.	Passeriformes	Sylviidae	<i>Minla strigula</i>	Chestnut-tailed minla	Shiv minla	1, 2
204.	Passeriformes	Sylviidae	<i>Orthotomus sutorius</i>	Common tailorbird	Paatsiuney fisto	1, 2
205.	Passeriformes	Sylviidae	<i>Paradoxornis nipalensis</i>	Black-throated parrotbill	Nepal bandar chari	1, 2
206.	Passeriformes	Sylviidae	<i>Phylloscopus affinis</i>	Tickell's leaf warbler	Pitodar fisto	1, 2
207.	Passeriformes	Sylviidae	<i>Phylloscopus castaniceps</i>	Chestnut-crowned warbler	Ratotauke fisto	1, 2
208.	Passeriformes	Sylviidae	<i>Phylloscopus chloronotus</i>	Lemon-rumped warbler	Pitkati fisto	1, 2
209.	Passeriformes	Sylviidae	<i>Phylloscopus collybita</i>	Common chiffchaff	Chipchipey fisto	1, 2
210.	Passeriformes	Sylviidae	<i>Phylloscopus fuscatus</i>	Dusky warbler	Godhuli fisto	1, 2
211.	Passeriformes	Sylviidae	<i>Phylloscopus humei</i>	Hume's warbler	Chanchale fisto	1, 2
212.	Passeriformes	Sylviidae	<i>Phylloscopus inornatus</i>	Yellow-browed warbler	Harit fisto	1, 2

213.	Passeriformes	Sylviidae	<i>Phylloscopus maculipennis</i>	Ashy-throated warbler	Fushrokanthe fisto	1, 2
214.	Passeriformes	Sylviidae	<i>Phylloscopus occipitalis</i>	Western crowned warbler	Thulo taludharke fisto	1, 2
215.	Passeriformes	Sylviidae	<i>Phylloscopus pulcher</i>	Buff-barred warbler	Suntalerekhi fisto	1, 2
216.	Passeriformes	Sylviidae	<i>Phylloscopus reguloides</i>	Blyth's leaf warbler	Taludharke fisto	1, 2
217.	Passeriformes	Sylviidae	<i>Phylloscopus trochiloides</i>	Greenish warbler	Jeeval fisto	1, 2
218.	Passeriformes	Sylviidae	<i>Phylloscopus tytleri</i>	Tytler's leaf warbler	Masino dhunde fisto	1, 2
219.	Passeriformes	Sylviidae	<i>Pnoepyga albiventer</i>	Scaly-breasted wren babbler	Katle dikure bhyakur	1, 2
220.	Passeriformes	Sylviidae	<i>Pomatorhinus ruficollis</i>	Streak-breasted scimitar babbler	Chaati dharse palkote	1, 2
221.	Passeriformes	Sylviidae	<i>Pteruthius flaviscapis</i>	White-browed shrike babbler	Lalpankhey bhadrai bhyakur	1
222.	Passeriformes	Sylviidae	<i>Pteruthius xanthochlorus</i>	Green Shrike babbler	Harit bhadrai bhyakur	1
223.	Passeriformes	Sylviidae	<i>Seicercus burkii</i>	Golden-spectacled warbler		1
224.	Passeriformes	Sylviidae	<i>Seicercus whistleri</i>	Whistler's warbler	Suseli fisto	1, 2
225.	Passeriformes	Sylviidae	<i>Seicercus xanthoschistos</i>	Grey-hooded warbler	Tumulkari fisto	1, 2
226.	Passeriformes	Sylviidae	<i>Stachyris pyrrhops</i>	Black-chinned babbler	Kalo chiunde ban bhyakur	1
227.	Passeriformes	Sylviidae	<i>Tesia castaneocoronata</i>	Chestnut-headed tesia	Rato tauke tisiya	1, 2
228.	Passeriformes	Sylviidae	<i>Trochaloxyron affine</i>	Black-faced laughingthrush	Kan tate toridanda	1, 2
229.	Passeriformes	Sylviidae	<i>Turdoides striatus</i>	Jungle babbler	Bagale bhyakur	1, 2
230.	Passeriformes	Sylviidae	<i>Yuhina flavicollis</i>	Whiskered yuhina	Jungey jurechara	1, 2
231.	Passeriformes	Sylviidae	<i>Yuhina gularis</i>	Stripe-throated yuhina	Thupal kalki jurechera	1, 2
232.	Passeriformes	Turdidae	<i>Monticola cinclorhynchus</i>	Blue-capped rock thrush	Sano hajara chanchar	1, 2
233.	Passeriformes	Turdidae	<i>Monticola rufiventris</i>	Chestnut-bellied rock thrush	Hajara chanchar	1, 2
234.	Passeriformes	Turdidae	<i>Monticola solitarius</i>	Blue rock thrush	Uma chanchar	1, 2
235.	Passeriformes	Turdidae	<i>Myophonus caeruleus</i>	Blue whistling thrush	Kalchuaunde	1, 2
236.	Passeriformes	Turdidae	<i>Turdus albocinctus</i>	White-collared blackbird	Kanthey chanchar	1, 2
237.	Passeriformes	Turdidae	<i>Turdus atrogularis</i>	Dark-throated thrush	Kalokanthey chanchar	2
238.	Passeriformes	Turdidae	<i>Turdus boulboul</i>	Grey-winged blackbird	Madana chanchar	1, 2
239.	Passeriformes	Turdidae	<i>Turdus merula</i>	Eurasian blackbird	Kalo chanchar	1, 2
240.	Passeriformes	Turdidae	<i>Turdus viscivorus</i>	Mistle thrush	Hadchur chanchar	1, 2
241.	Passeriformes	Turdidae	<i>Zoothera mollissima</i>	Plain-backed thrush	Sanodhade chanchar	1, 2
242.	Passeriformes	Turdidae	<i>Zoothera monticola</i>	Long-billed thrush	Lamothunde chanchar	2
243.	Passeriformes	Zosteropidae	<i>Zosterops palpebrosus</i>	Oriental white-eye	Kankir	2
244.	Piciformes	Megalaimidae	<i>Megalaima asiatica</i>	Blue-throated barbet	Kuthurke	1, 2
245.	Piciformes	Megalaimidae	<i>Megalaima virens</i>	Great barbet	Nyauli	1, 2
246.	Piciformes	Picidae	<i>Celeus brachyurus</i>	Rufous woodpecker		1
247.	Piciformes	Picidae	<i>Dendrocopos auriceps</i>	Brown-fronted woodpecker	Khairo tauke kasthakut	1, 2
248.	Piciformes	Picidae	<i>Dendrocopos himalayensis</i>	Himalayan woodpecker	Himali kasthakut	1, 2
249.	Piciformes	Picidae	<i>Dendrocopos hyperythrus</i>	Rufous-bellied woodpecker	Kailo chaat kasthakut	2

250.	Piciformes	Picidae	<i>Dendrocopos macei</i>	Fulvous-breasted woodpecker	Kasthakut	1, 2
251.	Piciformes	Picidae	<i>Picumnus innominatus</i>	Speckled piculet	Thopley sasiya	1, 2
252.	Piciformes	Picidae	<i>Picus canus</i>	Grey-headed woodpecker	Kalo gardan kathfor	1, 2
253.	Piciformes	Picidae	<i>Picus chlorolophus</i>	Lesser yellownape	Sunjure kathfor	1, 2
254.	Piciformes	Picidae	<i>Picus flavinucha</i>	Greater yellownape		2
255.	Piciformes	Picidae	<i>Picus squamatus</i>	Scaly-bellied woodpecker		1, 2
256.	Psittaciformes	Psittacidae	<i>Psittacula himalayana</i>	Slaty-headed parakeet	Madan suga	1, 2
257.	Strigiformes	Caprimulgidae	<i>Caprimulgus indicus</i>	Grey nightjar	Fusro chaitechara	1, 2
258.	Strigiformes	Strigidae	<i>Athene brama</i>	Spotted owl	Kochalgande latokosero	1, 2
259.	Strigiformes	Strigidae	<i>Athene noctua</i>	Little owl	Himali kochal gande	1, 2
260.	Strigiformes	Strigidae	<i>Glaucidium brodiei</i>	Collared owl	Sano dundul	1, 2
261.	Strigiformes	Strigidae	<i>Glaucidium cuculoides</i>	Asian barred owl	Thulo dundul	1, 2
262.	Strigiformes	Strigidae	<i>Glaucidium radiatum</i>	Jungle owl	Dundul	1, 2
263.	Strigiformes	Strigidae	<i>Strix aluco</i>	Tawny owl	Kailo pahadi ullu	2

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Checklist 7: Insects

SN	Family	Scientific Name	References
1.	Acrididae	<i>Spathosternum prasiniferum prasiniferum</i> Walker, F., 1871	11
2.	Acrididae	<i>Acrida exaltata</i> Walker, F., 1859	11
3.	Acrididae	<i>Oxya hyla hyla</i> Serville, 1831	11
4.	Acrididae	<i>Diabolocatantops pinguis</i> Stål, 1861	11
5.	Acrididae	<i>Xenocatantops humilis brachycerus</i> Serville, 1838	11
6.	Acrididae	<i>Eyrepocnemis alacris alacris</i> Serville, 1838	11
7.	Acrididae	<i>Leionotacris bolivari</i> Uvarov, 1921	11
8.	Acrididae	<i>Chloebora grossa</i> Saussure, 1884	11
9.	Anadenidae	<i>Anadenus nepalensis</i> Wiktor, 2001	2
10.	Apidae	<i>Bombus (Pyrobombus) miniatus</i> Bingham, 1897	4
11.	Apidae	<i>Bombus (Pyrobombus) rotundiceps</i> Friese, 1916	4
12.	Apidae	<i>Bombus (Bombus) tunicatus</i> Smith, 1852	4
13.	Branchinectidae	<i>Branchinecta orientalis</i> (Sars, 1901)	3
14.	Cantharidae	<i>Laemoglyptus (Silis) pectinicornis</i> Champion, 1924	13
15.	Cantharidae	<i>Malthinus lineatocollis</i> Champion, 1920	15
16.	Cantharidae	<i>Cantharis (Cyrtomoptila) biocellata</i> Fairmaire, 1891	14
17.	Cantharidae	<i>Prothemellus afghana</i> Wittmer, 1956	14
18.	Carabidae	<i>Pseudethira championi</i> Andrewes, 1926	19
19.	Carabidae	<i>Pterostichus (Pseudethira) championi</i> Andrewes, 1926	19
20.	Carabidae	<i>Lucicolpodes (Lucicolpodes) eberti mahakaliensis</i>	20
21.	Carabidae	<i>Nebria (Patrobonebria) pertinax</i> C.Huber & J.Schmidt, 2009	10
22.	Cerambycidae	<i>Exocentrus championi</i> Fisher, 1940	23
23.	Cerambycidae	<i>Exocentrus procerulus</i> Holzschuh, 1984	23
24.	Cerambycidae	<i>Exocentrus transversifrons</i> Fisher, 1940	23
25.	Cleridae	<i>Omadius zebratus</i> Westwood, 1852	9
26.	Coccinellidae	<i>Propylea dissecta</i> Mulsant, 1850	5
27.	Coccinellidae	<i>Afissula rana</i> Kapur, 1958	5
28.	Coccinellidae	<i>Jauravia quadrinotata</i> Kapur, 1946	5
29.	Coccinellidae	<i>Chilocorus alishanus</i> Sasaji, 1968	5
30.	Coccinellidae	<i>Calvia albida</i> Bielawski, 1972	5
31.	Coccinellidae	<i>Coccinella septempunctata</i> Linnaeus, 1758	5
32.	Coccinellidae	<i>Oenopia flavidbrunna</i> Jing, 1986	5
33.	Coccinellidae	<i>Epilachna marginicollis</i> Hope, 1831	5
34.	Coccinellidae	<i>Epilachna gorkhana</i> Miyatake, 1985	5
35.	Coccinellidae	<i>Afidenta misera</i> Weise, 1901	5
36.	Dasytidae	<i>Achaetomalachius kopetzi</i> (new species)	7
37.	Forficulidae	<i>Oreasiobia stoliczkae</i> Burr, 1912	16
38.	Forficulidae	<i>Allodahlia macropyga</i> Westwood, 1836	16
39.	Forficulidae	<i>Forficula Beelzebub</i> Burr, 1900	16
40.	Forficulidae	<i>Forficula schlagintweiti</i> Burr, 1904	16
41.	Hydraenidae	<i>Hydraena bihamata</i> Champion, 1920	12
42.	Hymenopodidae	<i>Creobroter apicalis</i> Saussure, 1869	8
43.	Labiduridae	<i>Forcipula trispinosa</i> Dohrn, 1863	16
44.	Limacidae	<i>Turcolimax oli</i> Wiktor, Naggs & Gupta, 1999	17
45.	Malachiidae	<i>Troglointybia nodifrons</i> Champion, 1921	22
46.	Melolonthidae	<i>Lasioserica maculata</i> Brenske, 1894	1
47.	Melolonthidae	<i>Serica khajjaris</i> Mittal, 1988	1
48.	Melolonthidae	<i>Serica thibetana</i> Brenske, 1897	1
49.	Melolonthidae	<i>Pachyserica marmorata</i> Blanchard, 1850	1
50.	Melolonthidae	<i>Maladera (Omaladera) simlana</i> Brenske, 1898	1
51.	Melolonthidae	<i>Maladera (Omaladera) emmrichi</i> Ahrens, 2004	1
52.	Melolonthidae	<i>Maladera thomsoni</i> Brenske, 1894	1

53.	Melyridae	<i>Sceloattalus bengalensis</i> Wittmer, 1966	21
54.	Prionoceridae	<i>Lobonyx kashmirensis</i> Fairmaire, 1891	6
55.	Pyrgomorphidae	<i>Atractomorpha crenulata</i> Fabricius, 1793	11
56.	Tenebrionidae	<i>Laena krishna</i>	18
57.	Tenebrionidae	<i>Laena weigeli</i> (new species)	18
58.	Tenebrionidae	<i>Laena broscosomoides</i> Kaszab, 1977	18
59.	Tenebrionidae	<i>Platycotylus ferrugineus</i> Kaszab, 1939	17
60.	Tetrigidae	<i>Criotettix bispinosus</i> Dalman, 1818	11
61.	Tetrigidae	<i>Coptotettix conspersus</i> Hancock, J.L., 1915	11
62.	Tetrigidae	<i>Hedotettix attenuatus</i> Hancock, J.L., 1904	11
63.	Tetrigoniidae	<i>Alloteratura</i> sp.	11
64.	Tridactylidae	<i>Xya mahakali</i> Ingrisch, 2006	11

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Annex

Annex 1: Population of ANCA Disaggregated by Rural/Municipality

Name	VDC (Wards)	Number of Households	Population		
			Total	Male	Female
Api Himal RM	Ghusa (1-9)	243	1,532	751	781
	Guljar (1)	123	866	453	413
	Khandeshwori (1-9)	521	3,151	1,573	1,578
	Sitaula (5-8)	198	1,230	602	628
Byas RM	Byas (1-9)	174	556	259	297
	Dhaulakot (1-9)	469	2,573	1,215	1,358
	Huti (1-9)	464	2,594	1,159	1,435
	Rapla (1-9)	239	1,187	574	613
	Sunsera (1-9)	573	3,437	1,658	1,779
Duhu* RM	Dhari (1-9)	758	4,175	2,010	2,165
	Hikila (1-9)	499	2,859	1,361	1,498
	Pipalchauri (1-9)	374	2,032	924	1,108
Marma RM	Guljar (2-9)	534	3,406	1,669	1,737
	Latinath (1-9)	787	4,675	2,259	2,416
	Seri (1-9)	423	2,456	1,189	1,267
	Sitaula (1-4, 9)	359	2,126	1,039	1,087
	Tapoban (1-9)	405	2,293	1,112	1,181
Naugad* RM	Eyarkot (1-9)	422	2,536	1,191	1,345
	Khar (1-9)	698	4,272	2,056	2,216
	Sipti (1-9)	749	4,339	2,064	2,275
Mahakali Municipality*	Brahmdev (1-9)	351	1,752	807	945
	Chhapari (1-9)	529	2,822	1,340	1,482
	Kante (1-9)	520	2,740	1,308	1,432
		10,412	59,609	28,574	31,036

*Some portions of these Rural/Municipality boundaries extend beyond ANCA.

Source: CBS (2014)



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ICIMOD



Department of National Parks and Wildlife Conservation
Babarmahal, Kathmandu, Nepal
Tel: (977) 1-4227926, 4220850, 4220912
Fax: (977) 1-4227675
Email: info@dnppwc.gov.np
www.dnppwc.gov.np