RARA LAKE RAMSAR
SITE MANAGEMENT PLAN

(2021-2025)

Ministry of Forests and Environment

Department of National Parks and Wildlife Conservation

Rara National Park, Hutu, Mugu

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Mohan Bikram Shrestha (A scenic view of Rara Lake)

Disclaimer:

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Government of Nepal
Ministry of Forest and Environment
Department of National Parks & Wildlife Conservation

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Nepal is a party to Ramsar Convention, an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources, since 1988. The Rara lake is the largest lake of Nepal located in the Himalayan biogeographic region and listed as a Ramsar Site in 2007. It is a unique and rare natural wetland type at the high altitude, hosts endemic fishes, and acts as an important ground for migratory bird species. However, a site management plan of this lake was not yet been prepared for its better management. Thus, for the long term conservation and management of the lake, the park managers and other stakeholders have expressed the need and importance of developing a site management plan. The need of development of such plan is also explicitly mentioned in the Rara National Park and its Buffer Zone Management Plan. The Rara Lake Ramsar Site Management Plan has been prepared using the evaluation tools such as Ramsar Management Effectiveness Tracking Tool (R-METT), Rapid Assessment of Wetlands Ecosystem Services (RAWES) and Rapid Capacity Building Needs Assessment (CBNA) to determine problems, gaps, challenges and issues at the site, which are officially recognized by Ramsar Convention.

I would like to express my sincere thanks to IUCN and CODEFUND for providing technical support and USAID/ DAI Paani Program for financial support in the preparation of this plan. More specifically, I would like to provide gratitude to Dr. Krishna Prasad Acharya, former Secretary of MOITFE, Karnali Province; Mr. Man Bahadur Khadka, Director General of DoFSC and Former Director General of DNPWC; Mr. Gopal Prakash Bhattarai, Former Director General of DNPWC and Dr. Ram Chandra Kandel, Deputy Director General of DNPWC for their continuous support and encouragement throughout the plan development process.

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I believe, this site management plan helps to address the identified threats and provides a framework for the long-term management of the Rara Lake Ramsar Site.

Deepak Kumar Kharal, PhD
Director General

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Photo 1: Birds found in Rara Lake. Photo Credit: USAID Paani Program/ Mohan Bikram Shrestha

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग
(..... शाखा)

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चलानी नं :- ४६०

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श्री रारा राष्ट्रिय निकुञ्ज कार्यालय
हुटु, मुगु ।

विषयः रारा ताल रामसार साईट व्यवस्थापन योजना तथा सो को IEE को कार्यसूची स्वीकृत गरिएको बारे ।

प्रस्तुत विषयमा रारा ताल रामसार साईटको क्षेत्र व्यवस्थापन योजना (Rara Lake Ramsar Site Management Plan) सम्बन्धी मिति २०७७/०६/१३ को देहाय बमोजिमको विभागीय निर्णय भएको ।

देहाय

१. रारा ताल रामसार साईटको क्षेत्र व्यवस्थापन योजना (Rara Lake Ramsar Site Management Plan) को अन्तिम मस्यौदा स्वीकृत गर्ने ।
२. रारा ताल रामसार साईटको क्षेत्र व्यवस्थापन योजना (Rara Lake Ramsar Site Management Plan) कार्यान्वयन गर्न सो को प्रारम्भिक वातावरणीय परिक्षण (IEE) गर्नुपर्ने भएको हुँदा त्यहाँ कार्यालयबाट पेश भएको प्रारम्भिक वातावरणीय परिक्षणको कार्यसूची (Terms of Reference) स्वीकृत गर्ने ।

तसर्थ, स्वीकृत कार्यसूची (Terms of Reference) बमोजिम योजनाको प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन तयार गरी स्वीकृतिको लागि यस विभागमा पेश गर्नुहुन समेत आदेशानुसार अनुरोध छ ।

हेम राज आचार्य
सहायक ईकोलोजिष्ट

ABBREVIATIONS

BCN	Bird Conservation Nepal
BZMC	Buffer Zone Management Committee
BZUCs	Buffer Zone User Committees
BZUGs	Buffer Zone User Groups
CBD	Convention on Biological Diversity
CBNA	Capacity Building Needs Assessment
CEPA	Communication, Education, Participation and Awareness
CODEFUND	Conservation Development Foundation
COP	Conference of the Parties
DAI	Development Alternatives Incorporated
DHM	Department of Hydrology and Meteorology
DO	Dissolved Oxygen
DoFS	Department of Forests and Soil Conservation
DNPWC	Department of National Parks and Wildlife Conservation
EC	Electrical Conductivity
EECG	Environment Education and Conservation Group
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
FNCCI	Federation of Nepalese Chamber of Commerce and Industries
FNU	Formazin Nephelometric Unit
GIS	Geographical Information System
HRC	Health Report Card
HWC	Human-Wildlife Conflict
ICT	Information and Communication Technology
IGA	Income Generating Activities
IUCN	International Union for Conservation of Nature
KII	Key Informants Interview
MAPs	Medicinal and Aromatic Plants
MDGs	Millennium Development Goals
MoFE	Ministry of Forests and Environment
MoITFE	Ministry of Industry, Tourism, Forest and Environment
NLCDC	National Lake Conservation Development Committee
NP	National Park
NPC	National Planning Commission
NPWC Act	National Park and Wildlife Conservation Act
NTB	Nepal Tourism Board
NTFPs	Non-timber Forest Products
NWCC	National Wetland Coordination Committee

NWP	National Water Plan
ORP	Oxidation Redox Potential
PA	Protected Area
PAANI	Program for Aquatic Natural Resource Improvement
PAME	Protected Area Management Effectiveness
pH	Potential Hydrogen
PSU	Practical Salinity Unit
RAWES	Rapid Assessment of Wetland Ecosystem Services
RIS	Ramsar Information Sheet
RLRS	Rara Lake Ramsar Site
RNP	Rara National Park
RRMCC	Rara Lake Ramsar Site Multi-stakeholder Coordination Committee
R-METT	Ramsar Management Effectiveness Tracking Tool
SDGs	Sustainable Development Goals
SMART	Spatial Monitoring and Reporting Tool
TOR	Terms of Reference
TDS	Total Dissolved Solids
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
VA	Vulnerability Assessment
WECS	Water and Energy Commission Secretariat (WECS)
WWF	World Wide Fund for Nature

CONTENTS

LIST OF FIGURES

LIST OF TABLES

OVERVIEW OF THE RAMSAR SITE MANAGEMENT PLAN

Rara Lake is the largest lake in Nepal, supporting endangered and vulnerable fauna and flora, including endemic species and supporting migratory and residential birds. The lake also supports the surrounding community, providing water for downstream communities and supporting local livelihoods. These factors led to the listing of the site as a Ramsar site, also known as a Wetland of International Importance under the Ramsar Convention on Wetlands of International Importance[1] in 2007. Despite this, the ecosystem services provided by Rara Lake are currently under threat from a range of factors, including pollution generated from increased visitor numbers, sewage discharge from hotels, park and army unit, infrastructure development, climate change and unsustainable use of natural resources. To protect Rara Lake and its resources, site management must address these threats.

This site management plan is part of management plan of Rara National Parks and Buffer Zone 2076/77-2079/80 (2019-2023) (Third version). The first step in developing a site management plan was to engage local stakeholders in a participatory consultation to learn about the site and how the community uses it. Information including aquatic biodiversity, water quality, wetland ecosystem services, and capacity building needs were collected during the field study[2] using the following tools recognized by the Ramsar Secretariat:

1. Ramsar site Management Effectiveness Tracking Tool (R-METT)
2. Rapid Assessment of Wetlands Ecosystem Services (RAWES)
3. Rapid Capacity Building Needs Assessment (CBNA)
4. Other checklists for key informant interviews (KIIs), Focus Group Discussions (FGDs) and site observations.

Results from the assessments formed the basis of the Rara Lake Ramsar Site Management Plan. The plan provides a framework for the long-term management of the Lake's natural resources. The vision of the Site Management Plan, defined by stakeholders, is: *"The ecological integrity of the Rara Lake Ramsar Site is conserved and/or restored and local people are benefitted through the wise-use of wetland resources. The management decisions are taken through inclusive processes involving concerned stakeholders."* Work toward this vision will be guided by four interlinked outcomes:

Outcome 1: Natural resource use is sustainable, and biodiversity is conserved through consistent monitoring and research.

Outcome 2: Livelihood/income sources are secured and diversified for local communities, while protecting cultural heritage.

Outcome 3: Ramsar site governance, management and funding are improved.

Outcome 4: Awareness and understanding of the importance of the Ramsar site at international, national and local levels are enhanced

The site management plan proposes the development of a Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee. The committee will consist of inclusive representation from all stakeholder groups, including community members, local government body, park, army and the private sector, to join in implementing the management plan in a way that promotes the sustainable use and conservation of the Ramsar site and its resources.

1. The Convention on Wetlands, known as the Ramsar Convention, is an intergovernmental environmental treaty established in 1971 by UNESCO (and signed at the small Iranian town of Ramsar), which came into force in 1975.
2. The project team used R-METT, RAWES and CBNA tools, and carried out Aquatic Biodiversity and Water Quality Measurement during thesite's field study from November 5-14, 2019.

1. STATE OF RARA LAKE RAMSAR SITE

1.1SITE LOCATION

Rara Lake Ramsar Site is a rare example of a natural wetland in the high Himalayan biogeographic region, and is the largest lake in Nepal, with a total area of 10.6 km2, a maximum length of 5.1 km and width of 3.2 km. It is an average of 100 m deep, with a maximum depth at 167 m (RNP 2019).

Rara Lake is fed by more than 30 small feeder streams with only one outlet at the western end that eventually joins the Karnali River, one of the four major rivers in the country (Gurung, et al. 2018) via Khatyad River. The lake is in western Nepal, within Rara National Park (RNP), in Karnali Province (Figure 1). RNP was designated as a national park in 1976 with a total area of 106 km2. Rara Lake is located at 23º32′25″N latitude and 82º04′54″E longitude, at an elevation of 2,990 m (Basnet 2011).

Himalayan lakes at and above elevations of 3,000 m are considered important water bodies, with their remote location maintaining pristine aquatic biodiversity and water quality. Rara Lake is classified as a remote, high altitude lake; however, recently it has become a tourism and research hotspot, due to an increase in accessibility.

1.1.1 Buffer Zone

The Rara National Park Buffer Zone (Figure 1) was declared on September 25, 2006, covering 198 km2 surrounding the park (RNP 2019). It encompasses the major part of Mugu (Chhayanath Rara Municipality, Khatyad and Soru Rural Municipality) and part of Jumla district (Kanakasundari Rural Municipality). There are 13,876 people living within the buffer zone, with 2,548 households, composed of a number of ethnic groups, with a majority of Chhetri, Thakuri and Dalits (RNP 2019).

The buffer zone is organised into 156 Buffer Zone User Groups (BZUGs), 10 Buffer Zone User Committees (BZUCs), one Buffer Zone Management Committee (BZMC), and 19 Buffer Community Forest User Groups (RNP 2019). The buffer zone receives up to 30% to 50% of the revenue generated annually by the Park for conservation and socio-economic development, of which BZMC allocates 30% of its budget for conservation programmes, 30% for community development programmes, 20% for income generation and skill development, 10% for conservation education and 10% for administrative expenses (RNP 2019).

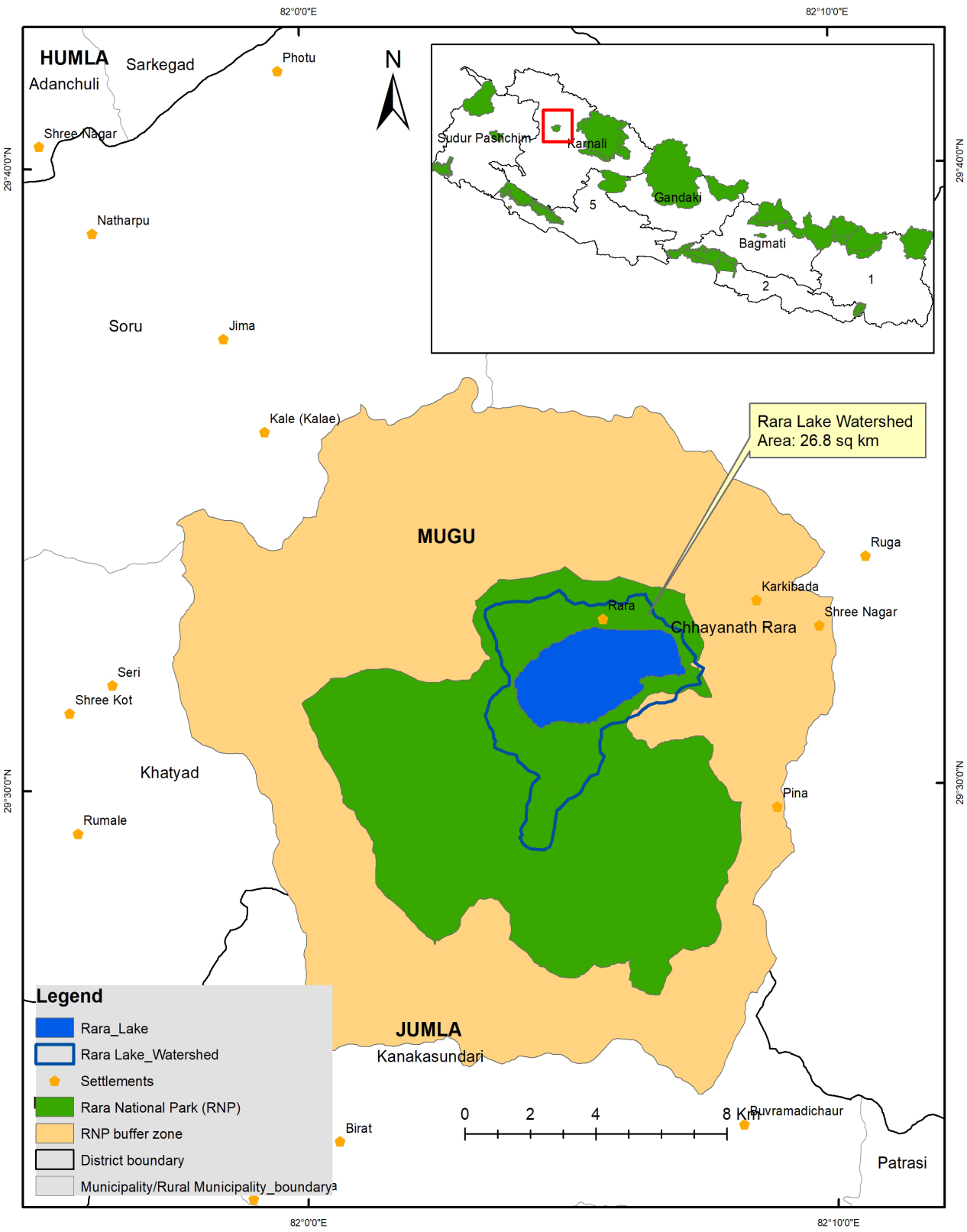

Figure 1 Location Map of Rara Lake Ramsar Site . (Source: IUCN Nepal)

1.2 PHYSICAL FEATURES AND CLIMATE

1.2.1 Landscape and Geology

Rara Lake is in the western end of a wide rhomboid-shaped valley that opens to the east. The surrounding mountains range from 3,200 m a.s.l. in the south to 3,700-3,900 m a.s.l. in the north and southwest (Yagi et al. 2009)

1.2.2 Water Analysis

Rara Lake is a warm monomictic and oligotrophic lake (Ferro 1978) surrounded by hills and mountains. A recent study by Gurung et al. (2018) demonstrated that the lake is characterized by an alkaline pH, low conductivity and limited phosphate.

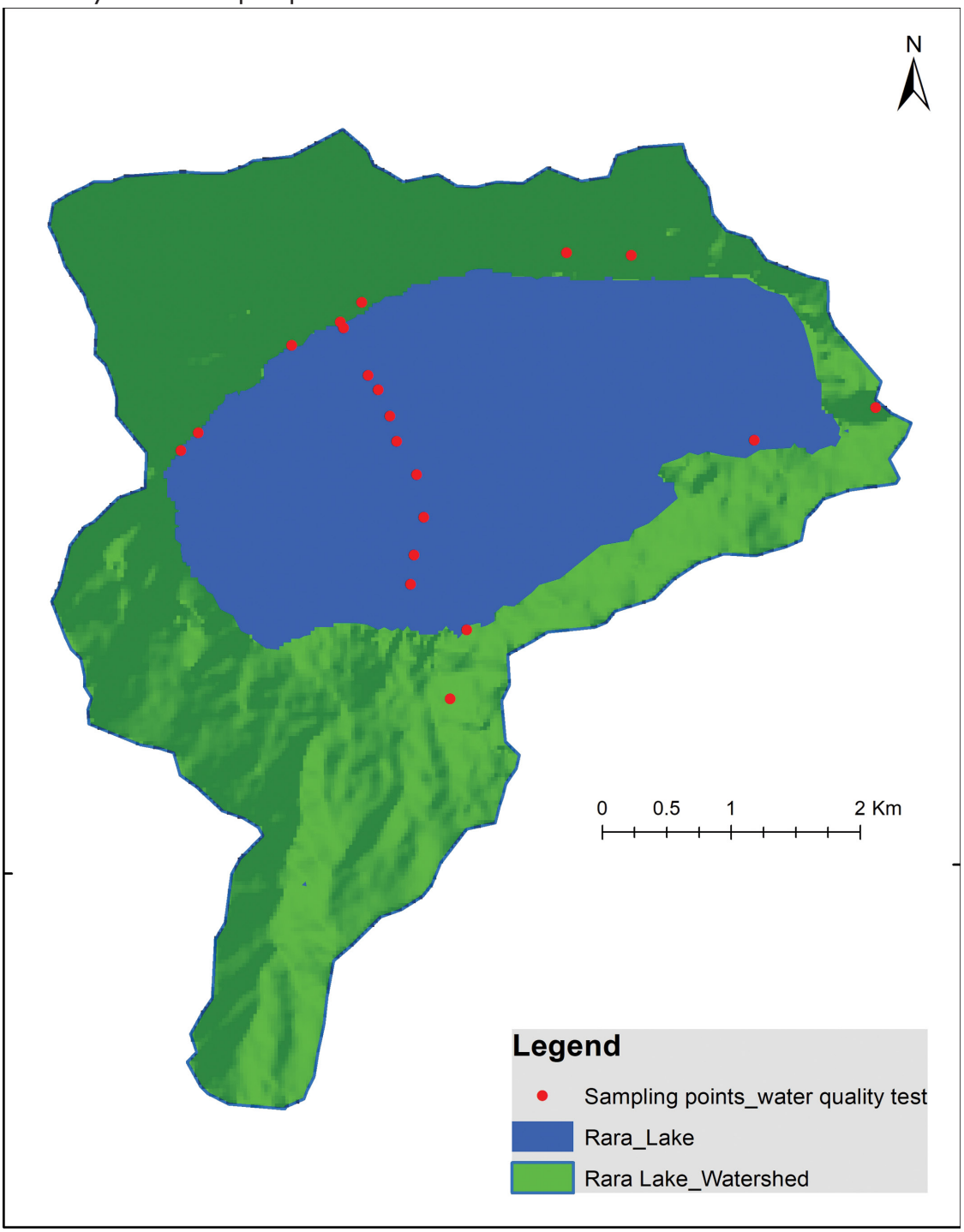

Figure 2 : Sampling points for the water quality test of Rara Lake.(Source: IUCN Nepal)

During a field survey conducted by the project team[3], most water parameters tested – temperature temperature, pH, Electrical Conductivity (EC), Oxidation Redox Potential (ORP), Total Dissolved Solids (TDS), Dissolved Oxygen (DO) Salinity (PSU) and Turbidity (FNU) – were found to be within the normal range according to Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem[4] (Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, June 16, 2008)) as sourced in Environment statistics of Nepal) (CBS 2019). The pH values were within the pH tolerance range of 6.5–8. 5. In some sampling sites, results were slightly higher (pH 7.5-8) mirroring previous research (Gurung et al., 2018).

The parameter analysis (Annex 4) demonstrates that the water quality is suitable for the protection of aquatic biodiversity. This analysis will be used as a basis for comparison in future assessments.

1.2.3 Climate

Rara National Park has an alpine climate with the wet monsoon in summer and dry weather conditions in winter (Aryal, Niroula and Ghimire 2019). The Department of Hydrology and Meteorology (DHM) collected temperature and rainfall data from the Rara Station for 37 years (1980 – 2016). The data show that the temperature in the region reaches its maximum in July and August (20°C – 21°C) and falls to a minimum from December to February (-2°C – -4° C) (Gurung et al. 2018).

The seasonal rainfall pattern is dominated by the southern monsoon that occurs between June and September (Lamsal et al. 2017). The highest and lowest monthly rainfall levels are observed in August (183.5 mm) and November (8.46 mm), respectively. The average annual rainfall for the Rara Basin is estimated at 777 mm, which is similar to that of the downstream Rara-Khatyad Basin at 755 mm (USAID Paani Program 2019).

The seasonal average rainfalls are as follows:

Winter (Dec-Feb): 98 mm

Pre-monsoon (Mar-May): 144 mm

Monsoon (Jun-Sep): 526 mm

Post-monsoon (Oct-Nov): 9mm.

From 1990-2016, the average maximum rate of temperature increase for the Rara-Khatyad watershed was +0.04°C per year (USAID Paani Program 2019). Climate change impacts have led to intensified rainfall during the monsoon period, and drier winter months (MoFE 2019). This has affected water resources, leading to scarcity during the winter to summer period, and the drying up of culturally important lakes, ponds, and other water resources. Changes in climate have increased the frequency of floods and droughts in the Karnali region, having a major impact on local communities (USAID Paani Program 2019).

3. The project team was a multidisciplinary team of experts established to develop the Rara Lake Ramsar Site Management Plan.

Designated roles included Ecologist; Aquatic Biologist; Limnologist; Protected Area Management Expert; Governance Expert; Sociologist; Economist; Eco-tourism Expert; Climate Change and GIS Expert; and Communication Officer.

4. http://www.wepa-db.net/policies/law/nepal/st03.htm

1.3 ECOLOGICAL FEATURES

Effective management requires an understanding of the habitats and species at the site, how these interact to form ecosystems, natural processes that sustain them and threats to these processes. The site description is based on an inventory of existing and new data, including the Ramsar criteria for which the site was originally designated.

1.3.1 Ramsar Site Designation Criteria

Rara Lake was designated as a Ramsar site, or wetlands of international importance, because it meets the following criteria (DNPWC/WWF Nepal 2006):

- **Criterion 1:** Largest Lake at high altitude - The Rara Lake system is a unique and rare example of natural wetland type in the high Himalayan biogeographic region. It is the largest lake in Nepal, lying in the central Himalaya at an altitude of 2,990 m. It provides water to the Karnali River, one of the four major rivers in Nepal.
- **Criterion 2:** Supports rare and vulnerable fauna and flora species - The area has developed unique floral and faunal assemblages with several rare and vulnerable species, such as Panch awle *(Dactylorhiza hatagirea),* Okhar *(Juglans regia)*, red panda *(Ailurus fulgens)*, musk deer *(Moschus chrysogaster)* and Asla Machha *(Schizothorax spp)*
- **Criterion 3:** Provides natural habitats for endemic species of plants and one frog species - The wet alpine pasture, moraines and damp river/stream banks along the lake area, including Karnali River catchment, provides habitat for various endemic species. The only endemic plant confirmed from this area is Nirbishi *(Delphinium himalayae)*; however, Kyasar *(Meconopsis regia)*, Primula poluninii and Cirsium flavisquamatum are potential endemic species to be found in the catchment. One endemic amphibian, Rara paha *(Paa rarica)* has been recorded in Rara Lake (Dubois and Matsui 1983)
- **Criterion 4:** Supports winter migratory birds - Rara Lake is the resting site of at least 49 species of water birds including the passage migrants - Bar-headed Goose *(Anser indicus)* and Northern Pintail *(Anas acuta)*, and the winter visitors - Common Teal *(Anas crecca)*, Tufted Duck *(Aythya fuligula*), and Goosander *(Mergus merganser)*. It is a breeding site of the Ruddy Shelduck *(Tadorna ferruginea)*, possibly a passage migrant. The residents of the site include the Eurasian Woodcock *(Scolopax rusticola)* and Brown Dipper *(Cinclus pallasii)* (DNPWC/WWF Nepal 2006)
- **Criterion 7:** Supports endemic fish species - Rara Lake provides a habitat for three of Nepal's six endemic species of fish *(Shrestha 2017*), including one species only found in Rara Lake. This is snow trout *(Nepali Asla (Schizothorax nepalensis)*, Rara Asla *(S.raraensis)* and Tilke Asla *(Schizothoraichthys macropthlaamus))*, known as Asla Machha in Nepali. Other fish species in Rara are: - Karange *(Naziritor chelynoides),* Dhami Machha *(Pseudecheneis serracula)*, Gindula *(Schistura rupicola)* and Budana *(Garra annandalei)* (Shrestha 2017)
- **Criterion 8:** Important sources of food for endemic fishes and migratory waterfowl – The Dytiscid beetle *(Dytiscidae),* mayfly *(Ephemeroptera)* and nymphs of caddies fly *(Trichoptera)* are well represented aquatic fauna and serve as food for snow trout and migratory waterfowl, as do the abundant water shrimp *(Gammarus sp.)*, aquatic beetles, hemipterans, snail *(Limnea and Planorbis)* and ram's horn *(Planorbis)* (DNPWC/WWF Nepal 2006). The activity of birds in Rara Lake contributes to the fish food chain in the lake. Important aquatic vegetation includes common reed *(Phragmites australis)*, rush *(Juncus leucanthus),* water sedge *(Fimbristylis complanata)* and maretail (*Hippuris vulgaris)* in the northern and southern regions. Potamogeton distinctus, Potamogeton natans, Potamogeton pusillus and Myriophyllum spicatum are the most common submersed plant species; Watermillfoil *(Myriophyllum spicatum)*, Bog bean *(Menyanthes trifoliata)* in the north-west margin

periphery provide fish food and cover. Isolepis setacea, Rumex acetosa, Plantago erosa, Polygonum aviculare, and Equisetum diffusum were observed in semi-aquatic habitats (Shrestha 2017).

1.3.2 Flora

Rara Lake is in the high-altitude Himalayan biogeographic region, covering temperate and sub-alpine flora. Mountains above 4,000 m run west to east along Rara Lake with diverse vegetation (Basnet, 2011). Approximately 245 species of plants have been recorded within Rara National Park. The Rara lakeshore is interspersed with small areas of mixed forest, shrub and grassland; predominantly conifer forest dominated by Blue pine *(Pinus wallichiana)* (Jüttner, et al. 2018). Other tree species around the Ramsar site include Rhododendron *(Rhododendron arboreum)*, Black Juniper *(Juniperus indica)*, West Himalayan Spruce *(Picea smithiana)*, Oak *(Quercus semecarpifolia)* and Himalayan Cypress (*Cupressus torulosa)* (Sharma et al., 2014). With an increase in altitude, the forest changes to a coniferous broadleaf forest of Fir, Oak, and Birch. Other deciduous tree species include Indian Horse-chestnut *(Aesculus indica)*, Walnut *(Juglans regia)*, and Himalayan Poplar *(Populus ciliata)* (Sharma 2012). A total of 16 endemic plants are confirmed in Rara National Park. Endemic plants include *Aconitum amplexicaule, Berberis hamiltoniana, Cirsium flavisquatum, Clematis phlebantha, Cotoneaster virgatus, Delphinium himalayai, Diplotaxis nepalensis, Duthiea nepalensis, Elymus nepalensis, Impatiens williamsii, Meconopsis regia, Oxytropis arenae-ripariae, Primula poluninii, Roscoea nepalensis, Saxifraga hypostoma, and Stellaria congestiflora* (Shrestha and Joshi 1996).

Photo 2: Pine forest and grazing land near Rara Lake. Photo Credit: IUCN

Some medicinal plants found in the park include: Kutki *(Neopircrorhiza scrophulariflora)*, Satuwa *(Paris polyphylla)*, Bikh *(Aconitum spicatum)*, Pakhanbed *(Bergia cillata)*, Lekh-satuwa *(Trillidium govanianum)*, Godano *(Pleurospermum dentatum)*, Padamchal *(Rheum australe)*, and Chuli *(Prunus cornuta)*. Among plant products Kakarsingi *(Pistacia chinensis subsp. integerrima)* and roots of Kutki *(Neopircrorhiza scrophulariflora)*, Jatamasi *(Nardostachys grandiflora)* and Guchche-chyau *(Morchella conica)* are

commercially important. Ghode marcha *(Thymus linearis)* and Godano *(Pleurospermum dentatum)* are used by local people as herbal tea.

Some of the Rare, Endangered and Threatened plant species found in Rara are Panch Awle *(Dactylorhiza hatagirea)*, Okhar *(Juglans regia)*, Talispatra *(Abies spectabilis)*, Jatamasi *(Nardostachys grandiflora)*, Lauth Salla *(Taxus wallichiana)* Sugandhawal *(Valeriana jatamansii)* and Kutki (Neopicrorhiza scrophulariiflora) which are listed in the Nepal government protected list *(DPR 2012)*. Further, Jatamasi *(Nardostachys grandiflora)* and Kyasar *(Meconopsis regia)* found in the park are listed in CITES Appendix II and III, respectively.

Macrophytes

The following macrophytes are present in Rara Lake: *Myriophyllum spicatum, Potamogeton distinctus, Potamogeton natans, Potamogeton pusillus, Utricularia australis, Isolepis setacea, Phragmites australis, Juncus leucanthus, Fimbristylis complanata, Hippuris vulgaris and Menyanthes trifoliata* (Shah 2019). A more comprehensive understanding of the distribution, density and biomass is essential for their management.

1.3.3 Fauna

Mammals

Approximately 51 species of mammals are found in Rara National Park. The park provides habitat for the endangered Apline musk deer *(Moschus chrysogaster)*, Himalayan tahr *(Hemitragus jemlahicus)*, Himalayan black bear *(Ursus thibetanus)*, Chinese pangolin *(Manis pentadactyla)*, grey wolf *(Canis lupus)*, wild dog *(Cuon alpinus)*, red panda *(Ailurus fulgens)*, and wild boar *(Sus scrofa)* (Thapa and Maharjan 2015). Among these, *Manis pentadactyla* is listed as Critically Endangered, *Ailurus fulgens, Moschus chrysogaster* and *Cuon alpinus* are listed as Endangered, *Ursus thibetanus* is listed as Vulnerable, *Hemitragus jemlahicus* is listed as Near-threatened, and *Canis lupus* and *Sus scrofa* are listed as Least Concern on the IUCN Red List.

Birds

Rara Lake serves as an important resting and breeding ground for migratory waterfowls across the Himalayas. A total of 284 species of birds have been recorded in the Rara (BCN 2015). A bird survey carried out from December 10, 2019 until January 2, 2020 revealed a total of 104 bird species (BCN 2020) in Rara, of which two species Common Pochard *(Aythya ferina)* and Bearded Vulture *(Gypaetus barbatus)* are Vulnerable and the remaining 102 species are listed as Near Threatened on the IUCN Red List. The study counted 2,415 individual birds of 104 species belonging to 15 orders and 39 families. Of the total 104 species, 16 were identified as waterfowls, 13 as wetland dependent and 75 as forest birds. Of the 104, some 48 species are full migrant birds, which include all waterfowl (16 species) and six species of wetland birds as well as 26 forest birds (BCN 2020).

Common winter visitors and passage migrants in Rara include the Bar-headed Goose (Anser indicus), Gadwall *(Mareca strepera)*, Mallard *(Anas platyrhynchos)*, Red-crested Pochard *(Netta rufina)*, Common Pochard *(Aythya ferina)* and Tufted Duck *(Aythya fuligula)*. The Greylag Goose *(Anser anser)*, Lesser Black-headed Gull *(Larus fuscus)* and Brown-headed Gull *(Larus brunnicephalus)* are rare passage migrants observed at Rara Lake. The Pallas's Gull *(Larus ichthyaetus)*, Goosander (Mergus merganser), Great Crested Grebe *(Podiceps cristatus)*, Great Cormorant, *(Phalacrocorax carbo)*, Common Moorhen *(Gallinula chloropus)* and Common Coot *(Fulica atra)* are common and frequent winter visitors. The Black-necked Grebe *(Podiceps nigricollis)* is a scarce winter visitor.

photo 3: Rara National Parks provides habitation to seasonal migratory birds. Photo Credit: USAID Paani program/ Tek Gharti Magar

Fish

Rara Lake is rich in fish diversity, including endemic species. Recent studies have developed an inventory of fish in Rara Lake and its associated waterways (Shrestha 2017). However, more detailed research is needed to understand the population dynamics and spawning grounds.

Photo 4: Rara snow Trout commonly known as Himali Asala. This species is endemic to Rara Lake only. Photo Credit: USAID Paani Program

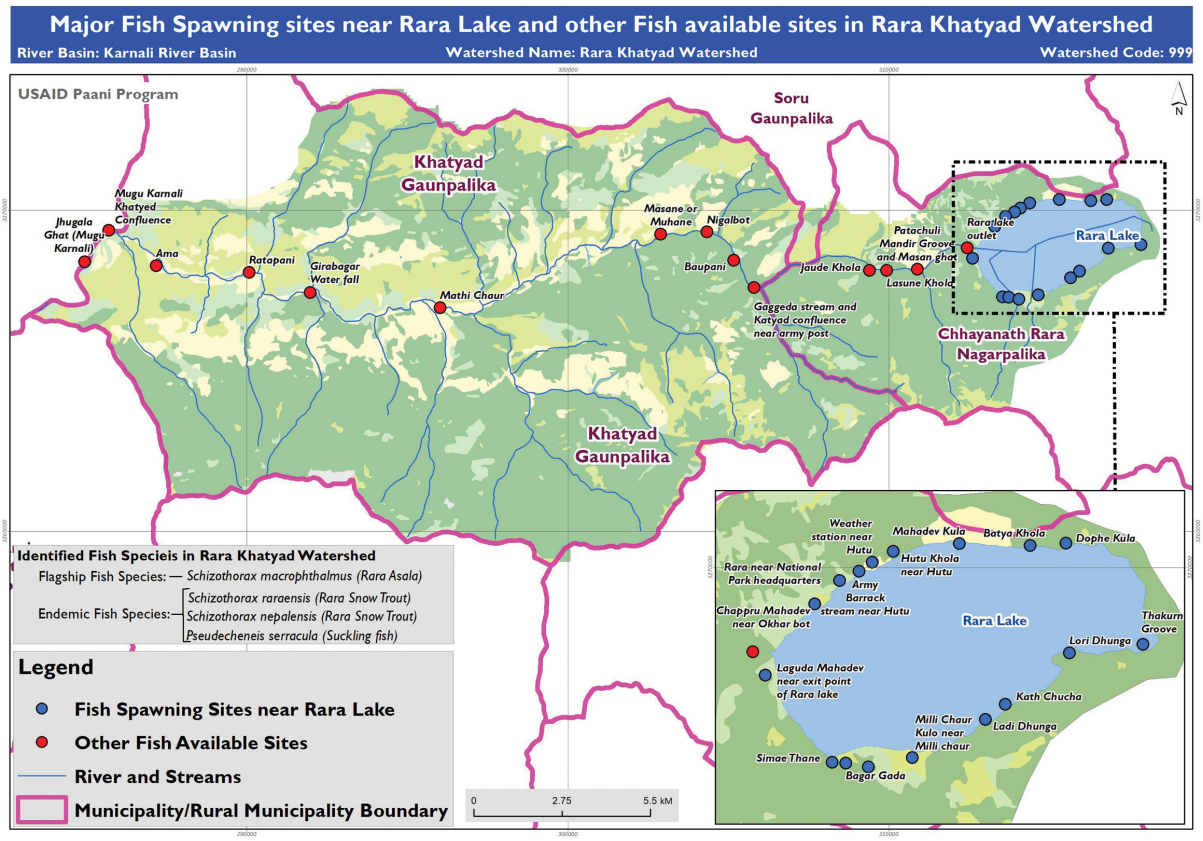

Figure 3: Major fish spawning sites near Rara Lake and other fish available sites in Rara Khatyad Watershed.

Source : USAID Paani Program

Rara Black Snow Trout *(Schizothorax rarensis)*, Nepal Snow Trout *(S. nepalensis)*, Large-eyed Snow Trout *(Schizothoraichthys macrophthalmus)*, Dark Mahseer *(Naziritor chelynoides)*, Torrent Catfish *(Pseudecheneis serracula)*, Stone Roller or Sucker Head *(Garra annandalei)* and Schistura rupicola are present in the lake and its inlet streams. Kunar Snow Trout *(Schizothorax labiatus)*, S. richardsonii, Tibetan Snow Trout *(Diptychus maculatus)*, Nepalese Minnow *(Psilorhynchus pseudecheneis)*, *Naziritor chelynoides, Pseudecheneis serracula, Schistura rupicola, Garra annandalei, Barilus barana, B. bendelisis, Puntius ticto, Amblyceps mangois, Glyptothorax gharwali, G. pectinopterus, Pseudecheneis serracula, P.* sulcatus, Macroganthus ara are present in the Khatyad Khola, the outlet of the lake (Shrestha 2017).

Three endemic fishes, *Schizothorax rarensis, S. nepalensis, Schizothoraichthys macrophthalmus, known* as Asla Machha in Nepali, breed in the lake and feeder streams joining it (Shrestha 2017). These are:

Nepal Snow Trout *(Schizothorax nepalensis)*

Nepal Snow Trout is known as Nepali Asla. The body structure is trout-like but more cylindrical, and it feeds on aquatic algae, mud and insects. Feeding occurs mainly in the early morning and evening. This snow trout generally becomes sexually mature in June and July, and spawns in the gravel beds until September (Shrestha 2017).

Large-eyed Snow Trout *(Schizothoraichthys macrophthalmus)*

Large-eyed Snow Trout have a pointed snout and are locally known as Tilke Asla due to their elongated body covered with shiny scales. The species is omnivorous and is reported to grow up to 20-25 cm in length and weigh up to 300 gm at full maturity. The spawning season varies from April to July. Spawning fish migrate to boulder-strewn tributaries and establish spawning dens in the loose gravel beds. The diet of this species includes mud, algae, fish larvae, insects,

aquatic invertebrates and eggs of other fishes (Shrestha 2017).

Rara Black Snow Trout *(Schizothorax rarensis)*

The Rara Black Snow trout is known in Nepali as Rara Asla because of its blackish colour. It is omnivorous and grows to 55-70 cm in length, with weights of up to 1-2 kg. The body is brown or black with black spots and fine patches along the lateral line. The spawning period varies from May to August. They usually migrate to streams joining the Rara Lake to select a spawning den. Food sources include mud, green algae, and aquatic insects (Shrestha 2017).

Amphibians

The frog species Rara Paha *(Paa rarica)* has been recorded as potentially endemic to the lake (Dubois and Matsui 1983). The habitat and ecological requirements of this species are poorly known, and are listed as data deficient in the IUCN Red List of Threatened Species (Ohler, Dutta and Shrestha 2004).

Macroinvertebrates

During the field study, an aquatic expert observed the following macroinvertebrate families in the lake and inlet streams: Gammaridae, Lymnaeidae, Dytiscidae, Elmidae, Scirtidae, Gyrinidae, Chironominae, Tanypodinae, Tipulidae, Limoniidae, Simuliidae, Limoniidae, Heptgeniidae, Ephemerellidae, Baetidae, Corixidae, Coenagrionidae, Aeshnidae, Megascolecidae, Luctridae, Nemouridae, Glossiphoniidae, Lepidostomatidae, Hydropsychidae, Hydropsychidae, Limnephilidae, Rhyacophilidae, Sphaeriidae and Planariidae (Shah 2019). These families of macroinvertebrates have several genera and species. A detailed baseline study needs to be conducted, including seasonal and inter-annual variation information.

1.4 COMMUNITIES AND LIVELIHOOD

The Ramsar Site lies inside Rara National Park with major parts of the park's area in the Karnali Province's Mugu district and the remainder in the Karnali Province's Jumla District. The catchment area of Rara Lake is 26.82 km2 and adjoins with three local government units in Mugu and Jumla districts.

Photo 5: Housing and settlement pattern of communities near Rara National Park: USAID Paani Program/ IUCN

Chayanath Rara Municipality has a total population of 25,346 people (13,340 male, 12,006 female), with a total of 4,983 households. Most people living around Rara Lake are Brahmin/Chhetri (~85%), followed by Dalit (10%), Janajati and others (5%). Ninety-eight percent of community members are Hindus, followed by Christians and Buddhists (~2%) (CRM 2018).

Mugu and Jumla districts are both ranked among the least-developed districts of Nepal (RNP 2019). The poverty[5] rate in the area is 47.1% and the per-capita average annual income is US$866 (CRM 2018). Poverty is exacerbated due to the remoteness of the area, a lack of fertile land, limited livelihood opportunities, and high illiteracy rate (RNP 2019).

The dominant livelihood, at 72%, is agriculture and animal husbandry. The remainder are labour-focused livelihoods (13%), followed by service (7%), business (5%) and others (3%) (CRM 2018). Most people are dependent on agricultural and forest resources. Aquatic biodiversity has enormous economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health.

Poverty has created a higher dependency on environmental resources resulting in wildlife poaching, timber smuggling, excessive grazing, and illegal harvesting of NTFPs within the National Park and Buffer Zone (RNP 2019). The USAID Paani Program has recommended the establishment of a community-based anti-poaching group that will monitor illegal fishing activity and poaching of animals and NTFP. Recommendations also include promoting alternative livelihood options of local communities linked to ecotourism. These activities could support the local economy, improve livelihoods and provide employment opportunities, such as local homestays for travellers, horse-trail rides to Murma Top, and bird-watching expeditions in the wetlands (USAID Paani Program 2019).

1.5 ECOSYSTEM SERVICES

Rara Lake Ramsar Site provides a range of ecosystem services with benefits at the local, regional and global scale. Local benefits, such as the provision of water for household use, are experienced by individuals, households or communities living and working in the immediate vicinity of the wetland. At the national level, Rara Lake has cultural value, and is a unique site for visitors. The assessment of ecosystem services and their valuation is important for the management of the Ramsar site. The ecosystem services provided by the Ramsar Site are described below.

1.5.1 Provisioning Services

The resources and ecosystems of Rara Lake support key livelihoods: agriculture, grazing areas for livestock and tourism. The Rara Lake is the primary tourism attraction of the Rara National Park (RNP). The Park offers opportunities for boating (non-electric), hiking, horseback riding, cultural interactions, and observing wildlife. Visitor's length of tour to RNP is on average 6-12 days and spending is US $280-900 per person per tour, excluding transportation (USAID Paani Program 2019). The wetland is a source of freshwater for downstream people for drinking, irrigation, other domestic purposes, and micro hydropower schemes (five of eight are currently operating in the Rara Khatyad watershed's main waterway, Khatyad Khola that originates in Rara Lake). Those operating collectively generate 160 kw of electricity (USAID Paani Program 2019).

1.5.2 Regulating Services

Rara Lake regulates downstream flooding, stores water and supports groundwater recharge. It also likely plays a role in local climate regulation in the area. These services are challenging to assess, and the nature and extent of the protection offered must be evaluated further. Wetland ecosystems are essential for climate change mitigation, as they sequester atmospheric carbon, providing global benefits.

5. Poverty incidence at $2 per day is at 57.3 percent in 2011. Country Poverty Analysis 2013. Asian Development Bank

1.5.3 Supporting Services

As a high-altitude lake, Rara provides a unique spawning area for endemic fish and other freshwater organisms. The rich biodiversity in the lake also supports diverse populations of migratory birds, who feed on the inhabitants of the lake. Wetlands also play a role in sediment retention, accumulation of organic matter, and nutrient cycling. These processes have not been studied in-depth at Rara Lake.

1.5.4 Cultural Services: Spiritual, Aesthetic and Tourism

Rara Lake and the surrounding area have high cultural significance to Nepali people, with various temples in the area (Figure 3). The temple of Thakur Baba is in the southeast part of Rara Lake. The local community believes that the Thakur god threw an arrow to discharge the water of the lake to reduce the potential damage caused by the lake overflowing, leading to the outlet stream. The Lamachaur temple near the lake is visited by locals and people from other districts on the occasions of Shrawan Purnima (Janai Purnima) in August, Baishakh Purnima in May, and during other festivals.

There are five temples in the Ramsar Site (Chhapru Mahadeva, Rara Mahadeva, Thakurnath Mahadeva, Laguda and Dopheshwar Mahadeva) with different incarnations of Lord Shiva. Of these temples, the Chhapru Mahadeva temple is located approximately 500 m south of the park office. It is the temple of the Chhapru village (one of the two villages relocated from Rara). The Nepal Army also performs puja (worship) at this temple during the main Hindu festivals. The deterioration of the area's cultural sites – such as decay of the building materials of temples and other religious sites, and loss of traditions – is due to a lack of restoration, regular maintenance, limited resources and transfer of knowledge. The park has dedicated funds for maintenance of temples and religious sites (RNP 2019). However, regular cleaning and maintenance of such cultural sites is important for their preservation, along with transfer of cultural and traditional knowledge to keep this important memory alive for future generations.

Other important cultural and historical sites include caves in the hills surrounding the lake, a groundwater tap which is said to be ancient and unique and believed to have been used by local royalty[6] (who once inhabited the area but are now resettled in Tarai) (DNPWC/WWF Nepal 2006) (RNP 2019) and stone sculptures with archaeological scripts, found near Murma village (DNPWC/WWF Nepal 2006).

6. Family belongs to King of Baise and Chaubise Rajya in the past

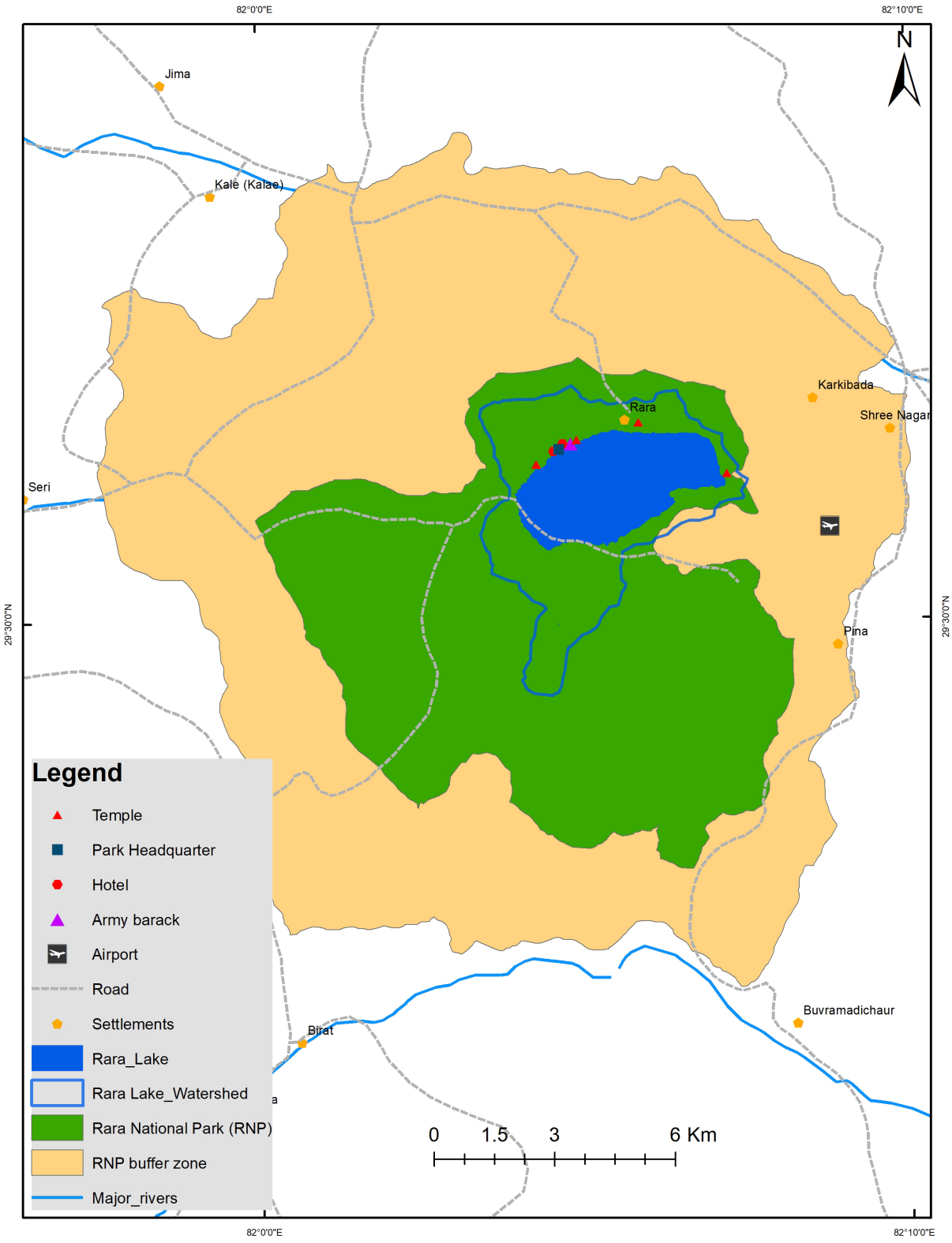

Figure 3 Religious Sites and Other Infrastructure near the Rara Lake. Source: IUCN NEPAL

The Mugali[7] people and their culture are at the centre of cultural tourism in the park (RNP 2019). Their rich culture and traditions are related to the Hindu and Buddhist religions. The Jumla district is thought to be the origin of the Nepali language and an ancient civilization centre of Nepal. The Khasha dialect is spoken in the area. To the east of the lake, the mountain

Chhayanath Himal is considered to be auspicious and is revered by Hindus and Buddhists (RNP 2019).

7. The Mugali are a remote Tibetan Buddhist tribe in Nepal who speak the main dialect of the Mugom language. https: en.wikipedia.org/wiki/Mugali

Tourism

Foreign and domestic visitor numbers to Rara Lake have been steadily increasing in recent years, due to the site's accessibility, transportation, hotels, homestays and facilities. Tourism generates income through the provision of recreational activities and services such as boating, horse riding and accommodation. Other recreational activities include hiking, bird watching, cycling, photography, motor biking and climbing.

Photo 6: Tourists visiting Rara Lake. Photo Credit: USAID Paani Program/ Bhupendra Shahi

Although there are both domestic and foreign visitors, park management has only maintained long-term records of international visitors. The number of foreign tourists depends upon the country's political stability; however, the number is increasing slowly, from 28 visitors in (2006) to over 317 visitors in (2018) (Figure 4). Park authorities have recently begun recording the number of domestic visitors to the site with the provision of park entry fee for domestic visitors in the revised Mountain National Park Regulation. In the last six months of FY 2076/77 (2019/20), there were 8,223 domestic visitors. High visitation by domestic tourists has fostered the growth of the tourism sector.

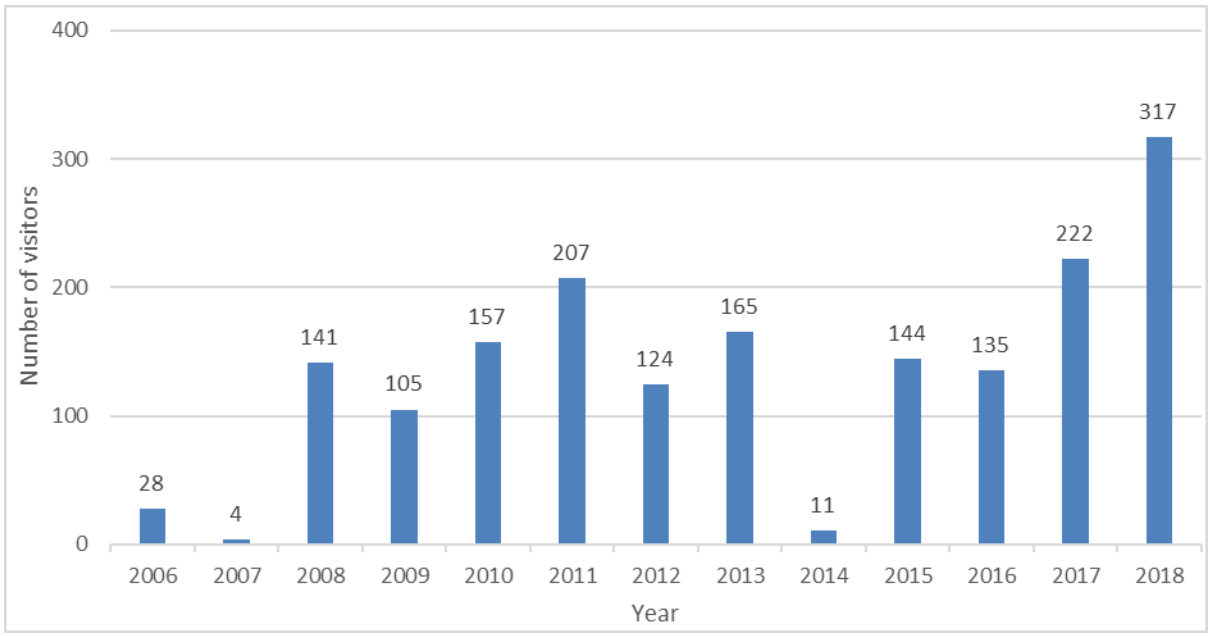

Figure 4 Foreign Visitor Flow in Rara National Park 2006 - 2018

(Data source: Rara National Park and its Buffer Zone Management Plan 2075/76 – 2079/80 (2019 – 2023) (DNPWC Annual Report 2018)

Ecotourism

The United Nations World Tourism Organisation (UNWTO) defines sustainable tourism as "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (cited by (Cerveny, Miller and Gende 2020)).

Photo 7: Camping site in the bank of Rara Lake: ICUN

An assessment of nature-based tourism by the USAID Paani Program (2019) and Karnali Province Tourism Master Plan (2020) in the Karnali region (including Rara) identified that there is a lack of environmental management practices for tourism infrastructure development (MoITFE 2020). In addition, the tourism industry does not sufficiently contribute to income generation for both the park and local people. The lack of marketing of the Ramsar site as a destination package limits the flow of foreign tourists. Further planning and management of the site would increase its visibility as a tourism destination. The Karnali Province Tourism Master Plan 2020 mentioned the Rara region as one of the five strategic tourism zones (as Rara-Jumla-Sinja-Kalikot Tourism Zone) of Karnali province, highlighting the product focus as Extreme Leisure, Pilgrimage/Spirituality/Wellness, Khasha Civilization & Heritage, Organic Agriculture, Wildlife and Special Interest Tourist Activities.

The assessment also suggested to develop cultural homestays as a destination in Murma village, and to develop Rara-Chayanath as a pilgrimage and a meditation site, providing local people with new job opportunities and attracting private sector investment in the community. It is necessary to set appropriate measures and limits of acceptable changes to minimize and mitigate the potential negative impacts of tourism, such as revising the eco-friendly infrastructure plan in the natural and cultural important sites of Outstanding Universal Value (OUV), which is recommended by the Karnali Province Tourism Master Plan (2020).

Proposed plans for the tourism sector are included in the Rara National Park and Buffer Zone Management Plan 2075/76-2079/80 (2019-2023) (RNP 2019). However, progress with implementation could be enhanced to better grow and improve tourism in the area. Under the guidance of the Ministry of Forest and Environment (MoFE) and Department of National Parks and Wildlife Conservation (DNPWC), Rara NP collaborates with local government, provincial government/Ministry of Industry, Tourism, Forest and Environment (MoITFE), Nepal Tourism Board (NTB), and other federal government ministries to diversify tourism. RNP (2019) acknowledges that full implementation may not be possible through their regular budget; this highlights the need for collaboration and coordination between all forms of management within the area.

2.POLICY AND GOVERNANCE

2.1 CURRENT POLICY AND LEGISLATIVE FRAMEWORK

The Constitution is the fundamental law of Nepal. Article 30 clearly provides for the right to a clean and healthy environment for every citizen, as well as the right to obtain compensation to a victim of environmental pollution or degradation. The Article encourages the making of necessary legal provisions for a proper balance between the environment and national development. Similarly, Article 51 (g) has provisions on policies relating to protection, promotion and use of natural resources, including to protect, promote, and make environmentally friendly and sustainable use of natural resources available in the country, maintaining ecological balance and mitigating risks from natural disasters. It also requires the State to pursue the principles of ecologically sustainable development, such as the polluter-pays principle, precautionary principle and prior informed consent. The management, conservation, establishment and development of wetlands is supported by the National Wetland Policy (2012), National Biodiversity Strategy and Action Plan (2014-2020), and the Nature Conservation National Strategic Framework for Sustainable Development (2015). Acts related to wetlands include the Aquatic Animal Protection Act (1960), National Parks and Wildlife Conservation Act (1973), Soil Conservation and Watershed Management Act (1982), Forest Act (2019) and Environment Protection Act (2019).

The legal framework for the mainstreaming of wetlands into the national planning process is guided by the Ramsar Convention (1971), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973), the Convention on Biological Diversity (1992), the United Nations Framework Convention on Climate Change (1992), the Aichi Targets (2011-2020), Sustainable Development Goals (2015-2030), the Sendai Framework (2015-2030), and the Paris Agreement (2015).

Photo 8: Communities nearby Rara National Park gathered in consultation meeting. Photo Credit: USAID Paani Program/IUCN

Table 1 Wetland-related Legislation in Nepal

Acts	Policies	Strategies	Plans and Guidelines
Aquatic Animal Protection (1960) National Parks and Wildlife Conservation Act (1973) Soil and Watershed Conservation Act (1982) Water Resources Act (1992) Solid Waste Management Act (2011) Local Government Operation Act (2017) Forest Act (2019) Environment Protection Act (2019) Control of International Trade of Endangered Fauna and Flora Act (2019) Local Aquatic Animal and Biodiversity Conservation Act (2020)	National Wetland Policy (2012) National Land Use Policy (2015) National Mineral Resource Policy (2017) National Forest Policy (2019) National Climate Change Policy (2019) National Environment Policy (2019)	Water Resource Strategy (2002) National Energy Strategy of Nepal (2013) National Agriculture Development Strategy (2014) Forestry Sector Strategy (2016) National Urban Development Strategy (2017)	National Water Plan (2005) Nepal Water Quality Guidelines (2005) National Biodiversity Strategy and Action Plan (2014-2020) Nature Conservation National Strategic Framework for Sustainable Development (2015) National Ramsar Strategy and Action Plan (2018-2024)

Key policies, strategies and plans are described below:

WETLAND RELATED KEY POLICES

1. ***National Wetland Policy, 2069 (2012):*** The principal wetland policy in Nepal, the National Wetland Policy, 2012, mentions the need for conservation, restoration and effective management of wetlands, identifying and designating the most important wetlands as Ramsar sites; integrated wetland conservation and watershed management; addressing the impact of developmental activities; payment for ecosystem services; communicating ecosystem function and services; and capacity building of concerned stakeholders for wetland conservation and promotion. This policy emphasizes the wise use and conservation of wetland resources based on ten key principles, four working strategies and ten priority actions that support the promulgation of the Wetland Conservation Act. For effective implementation, it is necessary to revise and mainstream the policy as per the national constitution and international cooperation policies such as Ramsar Convention, Convention on Biological Diversity (CBD), Aichi, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Migratory Species (CMS), Sendai Framework and the Sustainable Development Goal, etc. It is also crucial to review and harmonize the policy as per the governance system of the country.
2. ***National Forest Policy, 2075 (2019):*** The Forest Policy envisions the conservation of 40% of forest land. The policy interlinks wetlands with watershed management in the country. It highlights the key role of wetlands (and land) in improving productivity through an integrated watershed management practice, with the following strategic approaches: Adopting a river basin approach for watershed conservation and management; identification of wetlands along with their inventory and documentation; classification and designation of management authorities; capacity building and participatory planning for the conservation of wetlands and watershed areas, and the exploration of options for community conserved areas. The

operational guidelines emphasize climate change adaptation measures adopted through forest resources, watershed management, food security and water-induced disaster management, thereby contributing to the Sendai Framework for Disaster Risk Reduction.

3. ***National Climate Change Policy, 2076 (2019):*** The goal of National Climate Change Policy 2019 is to contribute to socio-economic prosperity of the nation by building a climate resilient society. The objectives of the policy are to enhance the climate change adaptation capacity of persons, families, groups and communities vulnerable to, and at risk of, climate change; and to build resilience of ecosystems that are at risk of adverse impacts of climate change. It emphasizes the formulation and implementation of action plans for the management of wetlands that are at risk of climate change.

4. ***National Environment Policy, 2076 (2019):*** The government has endorsed the National Environment Policy 2019 to control pollution, manage waste and promote greenery, so as to ensure citizens' right to live in a fair and healthy environment. The policy aims to lessen and prevent all types of environment pollution, and to manage waste emanating from all sectors, including home, industry and services. The Policy states that waste collection system will be made effective and littering will be completely restricted in wetlands, religious sites, road, and other public places.

WETLAND RELATED KEY ACTS

1. ***Aquatic Animal Protection Act, 2017 (1960):*** The act makes provision for the protection of aquatic animals, such as keeping fish ladders and hatcheries and other matters pertaining thereto, in order to maintain peace and order as well as for the convenience and economic interests of the general public. It clearly prohibits the catching, killing and wounding of aquatic animals without obtaining a license from the Government of Nepal or the local authority. It recognizes the value of wetlands and aquatic animals and restricts the use of explosive or poisonous substances into water resources with the intention of catching and killing of any aquatic animals.

2. ***National Parks and Wildlife Conservation Act, 2029 (1973):*** Known to be the oldest act for biodiversity conservation in Nepal, the National Parks and Wildlife Conservation Act, 1973, focuses on species and ecosystem conservation as well as habitat management. With a focus on the protected area systems, this act is crucial for wildlife habitat conservation, as well as sustainable protected area management.

3. ***Soil and Watershed Conservation Act, 2039 (1982):*** The Soil and Watershed Conservation Act, 1982, forms a legal basis for land and watershed conservation, essential for mountainous countries like Nepal. The Act gives authority to the Government of Nepal to declare any important site as a protected watershed area, while also permitting the Watershed Conservation Officer to maintain the sites within the protected watershed.

4. ***Water Resources Act, 2049 (1993):*** The main objective of the Water Resources Act is to make legal arrangements for determining the beneficial uses of water resources, preventing environmental and other hazardous effects and keeping water resources free from pollution.

    - Section 8 (1) states that any person or corporate body who desires to conduct a survey or to utilize water resources has to apply to the prescribed authority and submit necessary reports.
    - Section 9 focuses on proper utilization of water resources for hydroelectricity.
    - Section 16 has a provision for land acquisition from the government or public for the

construction of water resource projects. Government makes provisions for appropriate compensation as described under the Land Acquisition Act, 2034 (1977).

- Sections 18, 19 and 20 address water quality standards, water pollution and adverse effects on the environment. The Government of Nepal (GoN) may fix and maintain quality standards for water resources to establish limits for the discharge of pollutants to minimize adverse effect on the environment.
- Section 20 states that any construction activities which utilize water resources, must minimize soil erosion, landslide or other adverse environmental impacts.
- Section 22 has a provision of penalties for those who violate the rules and regulations.

5. ***Local Government Operation Act, 2074 (2017):*** This is a newly promulgated Act and it is focused on governance at the local level under the federal set-up. It clearly spells out the jurisdiction of local government over natural local resources, which includes watershed, wildlife and wetlands. However, there are some issues relating to the use of local resources that need to be discussed and resolved while making federal and state-level Acts and regulations in future.
6. ***Forest Act, 2076 (2019):*** The forest act focuses on sustainable forest management and the supply of forest products to Nepali people. This Act provides a clear jurisdiction for all national and private forests, which also covers the wetlands inside the forests. The Act gives special attention to payment for environmental services following upstream and downstream mechanisms, and environmental services produced by various forest ecosystems. It emphasizes landscape level conservation and encourages people to prepare plans for the conservation of watersheds and to halt any activities that have negative impacts on watersheds and that increase soil erosion.
7. ***Environment Protection Act, 2076 (2019):*** The Environment Protection Act aims to protect and promote the fundamental right of Nepalese citizens to live in a clean and healthy environment. It gives special focus to initial environmental examination of small projects and environmental impact assessment for larger projects. It emphasizes maintaining a proper balance between environment and development, mitigating adverse environmental impacts on environment and biodiversity, and facing the challenges posed by climate change. It focuses on the control of pollution and determines necessary standards for the mitigation of pollution from hotels, restaurants, vehicles, other places or activities, and effects from the disposal or emission of any hazardous substance.

WETLAND RELATED KEY STRATEGIES, PLANS AND GUIDELINES

1. ***National Water Plan, 2062 (2005):*** In order to implement the activities identified by the National Water Strategy, 2002, the Water and Energy Commission Secretariat (WECS) formulated the National Water Plan (NWP), which was approved by the government in September 2005. The NWP recognizes the broad objectives of the Water Resource Strategy and lays down short, medium and long-term action plans for the water resources sector, including programs and project activities, investments and institutional aspects. Further, it attempts to address environmental concerns and contribute to maximizing positive impact and minimizing or mitigating adverse impact in line with environmental sustainability concerns.
2. ***National Biodiversity Strategy and Action Plan, (2014-2020):*** The National Biodiversity Strategy and Action Plan (2014-2020) provides a framework for the management of the country's biodiversity and has listed wetlands as one of the priority areas for biodiversity conservation. This action plan promotes the wise use of resources and aligns with various

national and international obligations. For the management of wetland biodiversity, NBSAP provides different priority actions such as: effective implementation of the National Wetlands Policy (2012); controlling encroachment and eutrophication in at least 10 major wetlands and restoring at least 5 major degraded wetlands by 2020; declaration and management of at least three suitable wetlands as fish sanctuaries by 2017; promotion of PES mechanism in selected sub-watersheds; and diversifying wetland-based sustainable livelihood options through promotion of economically important wetland species.

3. ***National Ramsar Strategy and Action Plan, (2018-2024):*** The National Ramsar Strategy and Action Plan (2018-2024) is the first strategy and action plan for conservation of Ramsar sites in Nepal and is congruent with both the Sustainable Development Goals and the Aichi Biodiversity Targets. It considers the thirteen priority areas that are much like the priority areas of the Ramsar Convention. The goal of the National Ramsar Strategy and Action Plan (2018-2024) is to conserve, wisely use and restore the Ramsar Sites and ensure benefits to the local communities. It aims to value and recognize Nepal's Ramsar sites nationally and globally. The objectives of the National Ramsar Strategy and Action Plan are to effectively conserve and manage the Ramsar site network; to manage wetlands including the Ramsar sites on the principle of wise use; to engage federal, state and local stakeholders and build their capacity for wetland and Ramsar site conservation; to enhance Ramsar implementation through national and international cooperation; and to monitor and evaluate implementation of the National Ramsar Strategy and Action Plan.

WETLAND RELATED CONVENTIONS AND COMMITMENTS

1. ***Ramsar Convention on Wetlands of International Importance, (1971):*** The Convention on Wetlands of International Importance, known as the Ramsar Convention, aims to protect wetland ecosystems, promote their sustainable utilization, and set aside special areas as wildlife reserves. Each country needs to designate at least one wetland for inclusion on the list of wetlands. Nepal is an international flyway for migrating waterfowl in South Asia. This agreement may have a bearing on the development of potential of wetland areas as hydropower project sites. The Strategic Plan of the Ramsar Convention has emphasized the conservation of wetlands and urges parties to conduct an environmental assessment of the development proposals that are likely to have significant impacts on wetlands. Nepal ratified the Ramsar Convention on April 17, 1988. Nepal designated Koshi Tappu as its first Wetland of International Importance, or Ramsar Site. Nepal currently has 10 Ramsar sites, four in Terai, lowland, four in the Himalayas, and two in the mid-hills (MoFE 2018).

2. ***Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973):*** Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement to which states have agreed at a meeting of representatives of 80 countries in Washington, D.C., USA, on 3 March 1973 and entered into force in 1975. It provides a framework to the state party and the state party has to adopt its own domestic legislation to ensure that CITES is implemented at the national level. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

   Nepal is a State Party to Convention on International Trade in Endangered Species of Wild Fauna and Flora since 1975.

Photo 9: International Union for Conservation of Nature (IUCN) Nepal team conducting field level consultation with locals at Chayanath Raral Municipality for the preparation of Ramsar Site Management Plan on Nov 7. Photo Credit: USAID Paani Program/ Narayan Belbase

3. ***Convention on Biological Diversity (CBD) (1992):*** The convention aims to conserve biological diversity, to use its components in a sustainable way, and to share the benefits obtained from its genetic resources fairly and equitably. The Convention is governed by the Conference of the Parties (COP) and advances its implementation through the decisions it takes in its periodic meetings. Nepal ratified the Convention on Biological Diversity on November 23, 1993. MoFE is the focal point of CBD. As a CBD party, Nepal must formulate or adapt strategies and action plans for the conservation and sustainable use of biological resources. The National Biodiversity Strategy and Action Plan (NBSAP) implements the Convention at the national level.

4. ***Aichi Targets (2011-2020):*** Aichi Targets are the outcome of the Convention on Biological Diversity. They comprise five Strategic Goals with 20 ambitious targets. All Aichi Targets relate to wetlands in one way or another. Targets 2 and 3 include the values of wetland biodiversity and integrate them into national and local development, eliminating subsidies harmful to wetland biodiversity. Target 11 aims for biodiversity conservation and ecosystem services enhancement. Likewise, Target 15 focuses on climate change issues, ecosystem resilience and the contribution of biodiversity to carbon stocks, enhanced through conservation and restoration of 15% of the degraded ecosystem, thereby contributing to climate change mitigation and adaptation.

5. ***Sustainable Development Goals (2015-2030):*** With an aim to end poverty, protect the planet, and ensure prosperity for all as part of the sustainable development agenda, several countries adopted this set of goals on 25th September 2015. Each country was provided with specific targets to be achieved by 2030, i.e. 17 goals with 169 targets. Building on experiences with the Millennium Development Goals (MDGs), focused on developing countries, with environmental sustainability as just one of its eight goals, the 17 Sustainable Development Goals (SDGs) are more holistic, ambitious and visionary. SDGs specifically mention wetlands in relation to two of the goals (Goal 6 and Goal 13), and hence provide a policy context for the implementation of related conventions and plans. SDG 6 focuses on water and sanitation in terms of drinking water supply and sanitation, integrated water resources management, and the importance of water-related ecosystems. Target 6.6 emphasises wetland and the structure of the goal links wetlands directly with the increasingly urgent questions of water allocation, water risks and water scarcity while opening the door to the other SDGs.

6. ***Sendai Framework (2015-2030):*** This framework outlines seven targets and four priorities for action to reduce existing disaster risks. The targets include a reduction in the number of disaster mortalities and affected people, by 2030. It is relevant to wetland conservation since wetlands serve as natural buffers to hazard regulation. Moreover, World Wetland Day 2017 was celebrated with the theme "Wetlands for Disaster Risk Reduction." Nepal's geographical diversity and climate variability make the country vulnerable to various hazards.

2.2 INSTITUTIONAL ARRANGEMENTS

The MoFE is the line ministry for wetlands with the Department of National Parks and Wildlife Conservation as the Ramsar Administrative Authority in Nepal. Wetlands are also interwoven in other ministries and commissions such as the Ministry of Agriculture, Land Management and Cooperatives; Ministry of Education, Science and Technology; Ministry of Energy, Water Resources and Irrigation; Ministry of Industry, Commerce and Supplies; Ministry of Federal Affairs and General Administration; Ministry of Culture, Tourism and Civil Aviation; National Planning Commission (NPC); and WECS. Other institutions such as the Department of Forests and Soil Conservation (DoFSC), National Lake Conservation Development Committee (NLCDC), and municipalities are investing in wetlands, including Ramsar sites.

Nepal has developed a National Wetland Coordination Committee (NWCC) under MoFE with representation from wetland-related sectoral ministries. All of the ministries, department and divisions are under the federal government. The federal government coordinates with provincial governments, and the province government then work with local government bodies such as metropolitan cities, sub-metropolitan cities, municipalities or rural municipalities.

Rara Lake Ramsar Site is located within a protected area, therefore it is governed by DNPWC, which is a part of the federal government, according to the National Park and Wildlife Conservation Act (NPWC Act 2029). At Rara Lake, DNPWC coordinates with MoFE and line agencies under state government for the conservation of Ramsar sites within their respective jurisdictions.

Photo 10 : National level stakeholders engaged in a consultation with Department of National Park and Wildlife Conservation (DNPWC) on the preparation of Rara Lake Ramsar Site Management Plan. Photo Credit: USAID Paani Program/ IUCN

3. THREATS AND OPPORTUNITIES FOR RARA LAKE MANAGEMENT

3.1 THREATS AND CHALLENGES TO SITE MANAGEMENT

Rara Lake hosts high biodiversity and natural resources. Recent changes to the site, including increased visitor numbers and a dependence on the site by local communities can threaten the site if not properly managed. Although the visitor numbers is not problem in normal areas, poor infrastructures cause significant negative impact in the integrity of the lake. The project team conducted evaluation of the threats to the site using the Ramsar Management Effectiveness Tracking Tool (R-METT), with community consultations and discussions with site managers.

Threats to the Ramsar site are classified as high, medium and low. High threats are listed below and pose a serious risk to the key values of the Ramsar site. Annex 3: Threat Assessment lists the medium and low threats identified.

3.1.1 Tourism Activities and Infrastructure Development

While tourism has potential to provide income to the park and communities living within the buffer zone, it also poses threats to the integrity of the site if it is not carefully managed. In fiscal year 2019/20, the site had 8,223 domestic visitors (RNP 2019) following a trend of increasing visitation numbers that are straining current park facilities. There is a need to regulate tourism to minimize negative impacts to the ecosystem.

There are currently two hotels and one homestay present inside the Ramsar Site. Increased sewage discharge from hotels, park and army infrastructure can affect the lake chemistry, impacting the flora and fauna who rely on it and affecting downstream water users.

Unmanaged driving of vehicles in the grassland and jumbled horse-riding activities around the lake is disturbing wildlife and threatening grassland habitats, leading to erosion around the lake and increased sedimentation and water pollution. Records show that up to 30 four-wheelers and 30 motorbikes per day entered the grassland from September–November which is in increasing trend compared to previous years. Increasing numbers of visitors will likely exacerbate damage from vehicles, if not properly managed.

Solid waste from tourism has also increased at the site. A survey conducted by BCN in 2020 found a total of 9 kg of trash along a one kilometre transect. Non-biodegradable waste, such as bottles and other plastic can affect the aesthetic values of the site, as well as the flora and fauna. As horse-riding activities have become more popular around the lake, lack of waste disposal facilities has led to plastic pollution of water resources along the major trekking trails. More than 200 horses are used for horse riding tourism activities on the site. Horse manure found along the trekking route and around the lake is not only aesthetically displeasing but also ends up in the lake adding nutrients and pathogens. Horse manure was also observed in the large grassland area of the lake basin; this can produce significant changes in the vegetation and could possibly introduce invasive plants that could eventually colonise more pristine areas in the vicinity. Solid waste clean-up activities are being carried out by the park, but the park needs to increase capacity and resources to manage waste coming from increasing numbers of visitors. Therefore, a tourism management plan is needed, as also asserted in the Rara National Park Management Plan (2019).

Under the NPWC Act 2029, 50% of the annual tourism revenue generated by the Park supports conservation and socio-economic development; however, local communities are unsatisfied with the direct benefits they are getting from Ramsar site tourism, as the hotel operators are getting maximum benefits. This has led to strained relationships between the park and communities. This situation could be improved by diversifying the tourism activities, where local communities can be involved and generate income for their livelihoods.

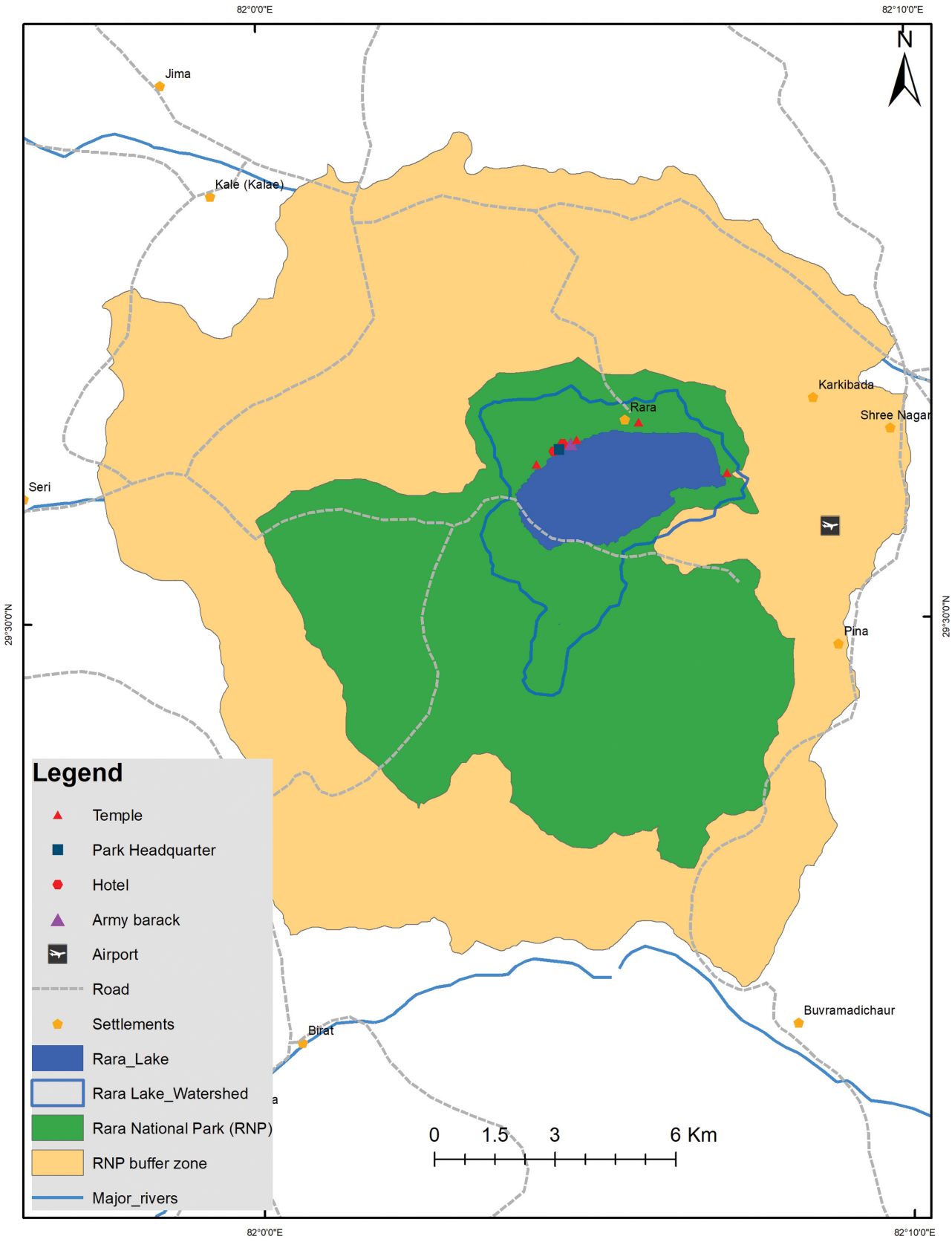

Figure 4 : Religious Sites and Other Infrastructure near the Rara Lake. Source: IUCN

3.1.2 Resource Use

High poverty rates[8] in the communities in the Rara Lake Buffer Zone have led to an increased reliance on the resources provided by the Ramsar site. With limited suitable grazing areas outside of the site, farmers rely on the Ramsar Site for grazing livestock, which can degrade forests and lead to erosion and increased sedimentation in the lake.

Grazing by livestock in Rara National Park and the lake catchment has also affected the occurrence of the red panda, which prefers areas without grazing activity (Thapa et al. 2020); (Sharma, Swenson and Belant 2014). Stakeholders raised concerns about the increased probability of disease transfer from livestock to wildlife.[9] Park values are also threatened by the illegal harvesting of non-timber forest products (NTFP) such as Guchchi mushroom (Morchella spp.).

In the past, the locals used to catch approximately 10 kg of fish per day from the confluence area of the lake and the feeding streams, but it's hard to find fish in those areas at present. Local stakeholders have reported a decline in the number of fish due to illegal fishing and changes in lake water quality. However, there has not been sufficient recent research to confirm these observations (Shrestha 2017)

3.1.3 Climate Threats

Climate change has led to temperature increases in the catchment of Rara-Khatyad watershed; however, these changes vary spatially and seasonally. The average maximum rate of temperature increase for the entire Rara-Khatyad watershed is +0.04°C per year (USAID Paani Program 2019). Rainfall has become more intense during the monsoon and consequently, the winter months are drier, leading to a scarcity of water resources during the winter to summer period.

The agriculture sector is most affected sector by climate change impacts, which are exacerbated by human development activities such as the construction of dams and road infrastructure (USAID Paani Program 2019). Crops farmed in the region include paddy rice, buckwheat, millet and lentils, which the communities rely on for livelihood and sustenance. The Karnali is the most underdeveloped region in Nepal, and is subject to repeated famines and drought, which are amplified by climate change. Agriculture in the Karnali region is dependent on monsoon rains, which are becoming increasingly uncertain, affecting the success of farming. Community members west of the lake in Murma Village have reported severe droughts over the last ten years. Reports of drought are based on the local perceptions and observations. A detailed study has not yet been carried out; however, drought is a major issue in Nepal due to climate change impacts (MoFE 2019). Emergence of crop disease and proliferation of pests, including severe flood and extended droughts, are closely related to climate change and have been increasing in both coverage and frequency (MoALMC 2018). Villages near the site have recently reported pathogens in fruits and vegetables, a concern for the health of the community, and likely to be related to changes in climate. A detailed study on pathogens and zoonotic diseases should be carried out to detect non-native or increased pathogen concentrations. The impact of climate change disproportionately affects low caste communities and women, as they are completely dependent on agriculture and livestock.

3.1.4 Threats to Cultural Heritage

There is a perceived loss of cultural links and traditional knowledge amongst the communities surrounding the lake. Residents still celebrate cultural and religious events; however, traditional knowledge is being lost due to lack of knowledge transfer, migration and lack of interest among youth. There are few job opportunities in the region; therefore, youth are forced to migrate to cities, affecting

8. Human Poverty Index value for Mugu is 61.1 in 2001 which declined to 45.22 in 2011. Nepal Human Development Report 2014. National Planning commission and UNDP

9. Details including the scale of this disease transfer is not known as this is based on the perception of the participants of FGDs.

not just the agricultural production but also other social development including loss of cultural, religious and traditional values. The rich Mugali culture and the historical and cultural significance around Rara Lake is fading because of lack of promotion and interest to carry on traditions. High poverty rates and limited time availability have led to local communities focusing more on income generating activities than on maintaining and renovating cultural sites. The changes in perception of people towards culture and tradition reduces the site's cultural values. The Rara National Park Management Plan has reported a need to protect, upgrade and promote cultural values and places such as religious temples and caves located in and around Rara Lake, providing an annual budget allowance for the maintenance of temples and other religious sites.

3.2 OPPORTUNITIES FOR RARA LAKE MANAGEMENT

There is a need to diversify income-generating activities at the site that are mutually beneficial to both the ecosystem and the community. The development of regulated and sustainable tourism activities will contribute to the preservation of the cultural features of the site. Improving cultural and traditional knowledge transfer to younger generations will also help to increase interest and, in turn, improve preservation.

Photo 11: Nepal Forum of Environmental Journalist (NEFEJ) organized a town hall meeting with local stakeholders on the issues of Rara lake management in 2019. Photo Credit: USAID Paani Program/ NEFEJ

Increasing both domestic and international tourism to Rara Lake will increase financial contributions from visitors. Increased monetary flow will enhance the livelihoods of local communities through sustainable ecotourism and development of locally suitable organic crops. There is potential to strengthen community capacity to fill positions outside of the agricultural sector, such as nature guides, hotel operators and hospitality management. This will diversify the livelihood options of the communities and reduce their dependency on Ramsar site resources. Local people will also

be encouraged to conserve and protect Ramsar site resources when they benefit from alternative livelihoods, which will help to maintain the ecological characteristics of the site. The park needs to have frequent interaction with the local communities as the Ramsar site lies inside the park. The development and implementation of Mountain National Park Regulation with the Ramsar Site will guide the Rara National Park to regulate its management activities more effectively and reduce the conflict between the park and communities.

Stakeholders have recommended developing visitor facilities to increase the attractiveness of the site to tourists. Developing signboards and an information centre will educate visitors on the cultural, ecological, and social significance of the Ramsar site. Developing this site as an ethical[10] birding site, with the construction of hides to observe birds and photography, will attract bird lovers including other tourists, and could set up an exemplary wetland site for birding. Local workers should be directly involved in designing, constructing and maintaining infrastructure, providing immediate and long-term economic and social benefits. Strengthening local leadership will promote community buy-in and support of the Ramsar site. Developing homestay businesses and a village museum will provide opportunities for the community to directly benefit from tourism and share their culture with visitors. These developments will attract private sector interest, leading to investments within the site and community. It is important to establish equitable benefit sharing guidelines to reduce confrontation between the park and local people. The RNP in coordination with local government and provincial government should facilitate these steps to attract the private sectors and investors.

Coordination is not only required between user groups, local businesses and communities and municipalities/rural municipalities, but also between management planners. To enhance sustainable tourism practices, the RNP authority needs to collaborate with stakeholders to develop new tourism plans, including those discussed above. This will ensure tourism plans and actions do not contradict each other, and instead provide maximum benefits to the site and stakeholders

10. Minimize any negative impact that recreational bird watching may have on birds.

4. THE MANAGEMENT FRAMEWORK

The Rara Lake Ramsar Site Management Plan preparation team worked with stakeholders to evaluate the key features and objectives for sustainable management of Rara Lake Ramsar Site. The results of the evaluation framed the key components of the management plan. The four main outcomes of the management plan include sustainable use of natural resources, strengthening livelihood and cultural heritage, site governance and awareness raising. These outcomes will contribute to the Rara Lake Ramsar vision:

"The ecological integrity of the Rara Lake Ramsar Site is conserved and/or restored and local people are benefited through the wise use of wetland resources. The management decisions are taken through inclusive processes involving concerned stakeholders."

4.1 GUIDING PRINCIPLES

This Site Management Plan embraces a set of principles, which should guide the sustainable, equitable and effective management of Rara Lake.

4.1.1 Ecosystem-based Approach to the Wise Use of Wetlands:

This approach considers the broad suite of biological, physical, and human elements in an ecosystem, and the interactions among these elements. "Wise use" is a central principle of the Ramsar Convention, which means "...the maintenance of [wetlands'] ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development." This Site Management Plan reflects system-wide perspectives for the wise use of the lake, buffer zone and watershed of Rara Lake, for nature conservation and natural resource management and for sustainable development and long-term livelihoods.

4.1.2 Livelihood Framework:

A thriving rural economy is crucial for improving livelihoods of disadvantaged women and men. Sustainable agriculture and tourism should provide enhanced food security and income. Diversification of livelihood skills and opportunities in alternative sectors are also important to consider. Livelihood strategies must be based on the wise use of the wetland in order to be economically viable and long lasting.

4.1.3 Stakeholder Participation Approach:

Equitable and sustainable management of the natural resources of Rara Lake should be achieved through a process of stakeholder participation in management, including decision-making, and implementation.

4.1.4 Inclusiveness, Gender, and Social Equity:

To promote a sense of ownership of the management process, and to ensure benefits to the most vulnerable population, the management of the Rara Lake should be inclusive, with equitable representation and active participation of stakeholder groups throughout the management process. This encompasses gender inclusiveness; women must be meaningfully included in the management process to ensure that their needs, rights, and contributions are fully valued. The benefits and costs of managing Rara Lake should not be concentrated only in certain stakeholder groups but should be distributed in a more equitable manner. Capacity building can prepare stakeholders for active participation in and leadership of management processes. Monitoring and evaluation should ensure that positive and negative impacts from management are not disproportionately borne by any group of stakeholders.

4.1.5 Conflict Sensitivity:

To ensure that the management of Rara Lake does not exacerbate underlying social tensions or contribute to conflict, it is important to integrate conflict sensitivity into management activities through a "do no harm" approach. An inclusive approach to management that involves diverse stakeholders can contribute to conflict sensitivity, by bringing more representative perspectives to decision-making and implementation. It is critical that monitoring and evaluation of management activities includes consideration of the social impacts of those activities, including impacts on relationships and tensions within and across stakeholder groups. Similarly, the planning of all activities should carefully consider the potential for unforeseen impacts on conflict. Conflicts that need to be resolved should be approached using Conflict Sensitive Project Management.

4.2 EVALUATION OF FEATURES AND DEFINITION OF MANAGEMENT OUTCOMES

This section helps to identify the outcomes, outputs and recommended activities based on evaluation of key features and threats. The table below presents the evaluation of key features including ecological, socio-economic, governance, knowledge and communication that are described in detail. The table highlights the threats and the factors to be considered to maintain the key features of the site and identifies the outcomes and outputs to address the threats identified.

Photo 12: Members of local community near Rara Lake. Credit IUCN Nepal

Table 2 Rara Lake Ramsar Site Key Features

ECOLOGICAL			
Features	**Threats**	**Features to be considered**	**Outcomes**
• Unique and rare high-altitude lake • Supports endangered and vulnerable flora and fauna • Natural habitat for endemic species of plants, one frog species, and endemic fish species • Supports migratory and residential birds • Important food source for endemic fish and migratory waterfowl • Hydrological values - regulates flooding downstream and provides a source for groundwater recharge and storage.	• Habitat degradation, erosion due to overgrazing • Potential livestock disease transfer to and from wildlife • Illegal harvesting of NTFPs/ MAPs • Lake pollution due to waste associated with hotel operations, and tourism activities including park and army activities • Decline in the number of fish • Increasing vehicle flow and unmanaged driving route at upper Milichaur • Climate change-induced hazards i.e. drought conditions, temperature extremes and landslides • Water seepage, decline in lake water level.	• Limited livestock grazing area outside National Park • High dependency of surrounding communities on Ramsar site resources • Lack of awareness of the Ramsar site boundary by local communities and visitors • Insufficient regular monitoring of ecological information including species and habitats • Limited knowledge and awareness of the significance of the Ramsar site by visitors including local communities • Limited awareness of resource conservation by local communities • Limited capacity of park staff (i.e., lack of training on lake management) to conduct research and management specific to Ramsar site • No specific staff assigned for the management of Rara Lake as Ramsar site • Lack of wetland management considering the whole catchment of Rara Lake. • No alternative infrastructure for relocating the park and army infrastructures and hotels	O1: Natural resource use is sustainable, and biodiversity is conserved through consistent site monitoring and research

SOCIO-ECONOMIC			
Features	**Threats**	**Features to be considered**	**Outcomes**
• Source of freshwater to downstream communities • Cultural and religious values • Tourism and recreation • Historical importance • Means of income generation through tourism activities such as horse riding, guides, homestays and hotels.	• Gradual loss of cultural and traditional knowledge and management practices • Crop disease and downstream flooding due to climate extremes i.e., increased temperature and drought conditions • Deteriorating cultural and religious site values • Unequitable benefit sharing from tourism (for eg two hotels in the park core area which are privately owned are getting maximum benefits) • Crop depredation by wildlife	• Poor visitors' facilities including toilets, accommodation, resting points • Improper placement of park and tourism infrastructure i.e. hotels in operation are very close to the Lake • Inadequate community capacity to handle increasing numbers of visitors • Limited tourism activities • Limited livelihood options • Lack of site-specific tourism management plan • Limited knowledge of commercial farming and agro-tourism • Limited awareness of sustainable use of natural resources by local communities • Limited transfer of knowledge of historical and cultural significance, resulting in decreasing maintenance and renovation of cultural sites.	O2. Livelihood/ income source for local communities is secure and diversified, protecting the cultural heritage.

GOVERANCE			
Features • The Ramsar site is governed by federal government under NPWC Act and regulation • DNPWC acts as Ramsar authority and MOFE as a focal ministry to the Ramsar Secretariat • Community participation in conservation and management through Buffer Zone system.	**Threats** • Occasional confrontation between park and people regarding resource use • Weak community engagement with site management	**Factors to be considered** • Limited coordination and communication among various stakeholders (local level communities, park and other concerned stakeholders) • Lack of specific staff assigned for Ramsar site management • Limited community engagement on site management • Lack of Ramsar site specific regulation • Various user group/committee board members include women only for formalities while decisions are still made by men • Lack of sustainable financial mechanism for research and management	**Outcomes** O3. Ramsar site governance, management and funding is improved.
KNOWLEDGE AND COMMUNICATION			
Features • Knowledge products of DNPWC and other conservation organisations • Efforts of conservation community, i.e. through BZMC.	**Threats** • Limited awareness of the status and significance of the Rara Ramsar site at local, national and international level • Lack of adequate publicity of the lake and its features for promoting conservation and ecotourism.	• **Features to be considered** • Limited information available to local communities • Limited access of information and communication between park managers, Ramsar local authority and Ramsar Secretariat • Limited capacity to disseminate information and knowledge management	**Outcomes** O4: Awareness and understanding of the importance of the Ramsar site at international, national and local level is enhanced.

4.2.1 Ecological

Evaluation

Rara Lake Ramsar Site is a unique example of a high-altitude lake in the Himalayan biogeographic region. It is the largest lake in Nepal, hosting one species of locally endemic fish (Schizothorax raraensis), two species of nationally endemic fish *(Schizothoraichthys macropthalus, Schizothorax nepalensis)* and one species of nationally endemic amphibian Rara paha *(Paa rarica)*. The wet alpine pasture, moraines, and damp stream banks along the lake area are the natural habitats for endemic plants including Nirbishi *(Delphinium himalayai)*. Rara Lake provides food and refuge for at least 49 species of migratory and resident water birds. The wetland is a source of freshwater for downstream communities, used for irrigation, micro hydropower and other domestic purposes. It regulates downstream flooding and supports ground water recharge.

Waste from hotels, park and army infrastructure near the lake has affected aquatic species diversity including endemic fish species, their population and habitat. Tourism-related activities coupled with widespread illegal livestock grazing, have degraded grasslands and forests around the lake, leading to erosion and increasing lake sedimentation. There has been a decline in the number of fish in the lake due to habitat disturbance and pollution, further exacerbated by illegal fishing and illegal harvesting of NTFPs.

Climate change threats to Rara Lake Ramsar Site include temperature and rainfall variations, droughts and the depletion of the lake water level. Other major threats include the colonization of invasive species, lack of research and monitoring of existing biodiversity and lack of conservation measures for inlet stream management.

Outcome 1: Natural resource use is sustainable, and biodiversity is conserved through consistent site monitoring and research

Factors influencing the achievement of Outcome 1

There has been limited research on the site's biodiversity, species abundance and distribution, threats and conservation requirements. Site staff have minimal research and monitoring capacity. There is a lack of awareness of the significance of the Ramsar Site and its ecological values among community members. There are few alternative livelihood options to reduce local dependency on Ramsar site resources.

To address the threats described above, the following outputs have been planned.

Output 1.1: *Rara Lake Management Task Force formed and trained to conduct site-specific research and management.*

The Task Force will be formed with a ToR and financial plan. The members of the Task Force will be trained on research and management to ensure updated information and regular monitoring. All the necessary research equipment, including water quality test kits and spatial monitoring and reporting tool (SMART) patrolling tool will be provided.

Output 1.2: *Knowledge and monitoring of ecological features of the Ramsar site strengthened.*

Research will address knowledge gaps on species diversity, population and their habitats. The R-METT assessment will be completed and the RIS sheet will be updated with revised boundaries and ecological data.

Output 1.3: *Key ecological features of the Ramsar site restored and conserved.*

Based on the findings of Output 1.2, species and habitats will be restored and conserved, ensuring their proliferation and the maintenance of the site's unique characteristics.

4.2.2 Socio-economic

Evaluation

The site has high economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health; providing a source of fresh water to downstream communities.

Foreign and domestic visitor numbers have been increasing, attracted by the site's accessibility, transportation, hotels, homestays, facilities and aesthetic values. Tourism generates income through the provision of recreational activities and services such as boating, horse riding and accommodation. Other recreational activities include hiking, bird watching, cycling, photography and climbing. However, the benefits from tourism are limited to hotel operators and some minor groups of people from horse riding.

Rara Lake is located in the Karnali province, an ancient civilization centre of Nepal where the Nepali language originated. The site is rich in cultural heritage sites such as caves, temples and shrines. Developing sustainable tourism activities will contribute to the preservation of the cultural features of the site.

The Karnali region is the least developed region in Nepal. People from the region often migrate to other cities of Nepal, India and other countries seeking better job opportunities. High poverty rates increase the community's dependency on environmental resources, often leading to encroachment and poaching. Agriculture, the main source of income generation is being affected by climate change impacts such as increasing temperatures, erratic rainfall, crop disease and downstream flooding, resulting in low crop yields. In addition, farmers are facing crop depredation by wild boars and monkeys. A lack of alternative job opportunities and unequitable benefit sharing from tourism, including privately owned hotels benefitting disproportionately from tourism, discourage local people from conserving and protecting the Ramsar site.

Outcome 2: Livelihood/income sources secured and diversified for local communities, protecting the cultural heritage

Factors influencing the achievement of Outcome 2

There is a lack of interest in the culture of the site among new generations. High poverty rates and a lack of higher education is preventing the development of business skills amongst the local community. Limited visitors, despite efforts to draw them to the site, may lead the community to continue to use the site's resources in an unsustainable manner. Accommodation and transportation facilities, particularly hotels nearby the Village of Rara Lake and roads for visitors, are improved compared to the past years.

To address the threats described above, the following outputs have been planned:

Output 2.1: *Adaptive capacity of communities to changing climate around the Ramsar site increased.*

To increase adaptive capacity of communities, strategies will be put in place to raise awareness of climate vulnerability, train people on climate adaptation, and promote livelihood adaptation and diversification practices in the agricultural sector and tourism industry

Output 2.2: *Local communities encouraged to preserve and promote their cultural and religious values in and around the Ramsar site. Organising seasonal events will attract private sector investment in the community.*

The development of a village museum and supporting communities in income generating activities (IGA), including documentation of traditional knowledge and skills (ethnobotanical documentation) will encourage local people to maintain and renovate cultural and religious sites.

Output 2.3: *Eco-tourism strategy for the Ramsar site that identifies opportunities for community involvement, private sector engagement, shared benefits and compatibility with the maintenance and improvement of the ecological character of the Ramsar site will be developed and implemented.*

Revise eco-friendly infrastructure plan, upgrade visitor's facilities, train communities to be nature guides and work in hospitality management, including marketing that supports the engagement of local people in sustainable tourism.

4.2.3 Governance

Evaluation

The Rara Lake Ramsar Site is located inside Rara National Park and is under the management of the federal government. DNPWC is the national Ramsar administrative authority, and is responsible for liaising with the Ramsar Secretariat. The conservation and management of the Ramsar site is also governed by the National Park Management Plan. Effective governance mechanisms that support coordination and cooperation among various organisations such as Hotel Association Nepal, NTB, FNCCI and stakeholders such hotel operators, local government, community groups and committees can strengthen the wise use of the available resources. The development and implementation of Ramsar site regulation could improve the site governance and guide the RNP to manage the site effectively. Transparent and accountable governance practices support management interventions and help to implement the site management plan to address the identified threats.

Outcome 3: Ramsar Site governance, management and funding is improved

Factors influencing the achievement of Outcome 3

The governance of the Ramsar site can be improved with the better communication and coordination among the stakeholders. Knowledge of the management of Ramsar sites and the Ramsar Convention can be enhanced through training, improving data base management and employing a sustainable financing mechanism. Active participation of the local people in conservation and management can be increased by involving community representatives in decision-making. A specific committee for the Ramsar site management is necessary to monitor the site and ensure the implementation of the management plan.

To address the threats described above, the following outputs have been planned:

Output 3.1: *Participatory approach will be strengthened by developing a Rara Lake Ramsar Site* Multi-Stakeholder Coordination Committee (RRMCC) that is responsible for monitoring and implementing the management plan. The committee will meet regularly to discuss the problems, issues, gaps and challenges in the conservation and protection of the site.

Output 3.2: *Long-term enforcement capacity of park authorities will be strengthened by adopting* SMART patrolling techniques and regulations. The resource use of the site will be regulated, including training the management of the Ramsar site on transparency, rights and benefit-sharing.

Output 3.3: *Long-term knowledge management capacity of park authorities will be ensured by* establishing the data management system and training the relevant staff.

Output 3.4: *Innovative and sustainable financing mechanisms and funding strategies will be developed and established,* through the engagement of multiple stakeholders, including the private sector, to ensure reliable sources of revenue to promote wetland conservation and local livelihoods.

4.2.4 Knowledge and Communication

Features

Information on Rara Lake is mentioned only as a part of Rara National Park. Visitors and local people are not aware that Rara Lake is a Ramsar Site. There are no information boards installed at the site regarding the designation of a Ramsar site, or why the Lake is particularly unique. DNPWC has published some knowledge products, but none are specific to the Ramsar site. Site managers must work to ensure that there is an understanding of the benefits provided by the site, to both the ecosystem and surrounding community. Raising awareness of site degradation and how to prevent it, is key to strengthening the resilience of Rara Lake.

Outcome 4: Awareness and understanding of the importance of the Ramsar Site at international, national and local level is enhanced

Factors influencing the achievement of Outcome 4

There is a limited understanding among locals and visitors of the importance of Ramsar sites. The limited research on the status of flora and fauna found in the Ramsar site affects their understanding of the importance of the Ramsar Site. Further, the Karnali region has the lesser priority area status given by the state for the development of infrastructure and tourism in the past. Limited site capacity and infrastructure for visitors can prevent the achievement of Outcome 4.

To address the threats described above, the following outputs have been planned.

Output 4.1: *Awareness will be raised through the development and implementation of a comprehensive Ramsar Communication, Education, Participation and Awareness (CEPA) strategy involving local stakeholders, including women and youth.*

This will be achieved by establishing a wetland information centre, promoting the Ramsar site to a wider audience, developing wetland related educational programs and installing site information boards.

4.3 MANAGEMENT LOG FRAME

Table 3 Management Log Frame

Project Outcomes/Outputs	Indicators of Achievement	Means of Verification	Baseline	Risks/ Assumptions
OUTCOME 1: NATURAL RESOURCE USE IS SUSTAINABLE AND BIODIVERSITY IS CONSERVED THROUGH CONSISTENT SITE MONITORING AND RESEARCH	By 2025, key aquatic species and habitat are managed and restored based on well informed, science-based knowledge	Annual Progress report	Ramsar site declaration protocol	Adequate budget and staff provided by the management authorities to implement management activities
Output 1.1: Rara Lake management Task Force formed and trained to conduct site-specific research and management	Ramsar Task Force created by 2021 to support the implementation of the management plan Number of trainings to Task Force by 2022	Protocol/guidelines for Task Force Task Force TOR Financial plan and letter of commitment of annual funds from DNPWC Meeting minutes of Task Force Training Reports	To date, a lake management Task Force has not been formed	DNPWC as a management authority will be supportive in taking necessary actions and communities are cooperative
Output 1.2: Knowledge and monitoring of ecological features of the Ramsar site strengthened	The main gaps in knowledge that were identified during the development of the management plan have been filled and the knowledge gained has informed on-the-ground action by 2022 Water quality monitored annually and health report card (HRC) baseline initiated by 2022 RIS boundaries revised by 2025	Various assessment reports (such as habitat mapping, vulnerability assessment, ecosystem services, water health) and survey and monitoring guidelines Database New RIS sheet	To our knowledge, few, if any, research studies have been conducted on the overall ecological features of the site Some water quality studies have been conducted but a health report card has not been developed RIS not updated	Research institutions and concerned conservation partners Such as IUCN, NTNC, WWF are interested to fulfil the knowledge gaps of Rara Lake Ramsar Site.

Project Outcomes/Outputs	Indicators of Achievement	Means of Verification	Baseline	Risks/ Assumptions
Output 1.3 Key ecological features of the Ramsar site restored and conserved	Set of clear and SMART actions designed and implemented to conserve the key ecological features of the lake by 2022, and Target defined per species/type of ecosystem maintained by 2023	Implementation action plans Monitoring reports Number of sites (fish conservation zone, grassland, forest) managed	Rara National Park management plan has some activities related to habitat management but not based on any detailed study	DNPWC will meet regularly and closely monitor the implementation of action plans
OUTCOME 2: LIVELIHOOD/ INCOME SOURCES SECURED AND DIVERSIFIED FOR LOCAL COMMUNITIES, PROTECTING THE CULTURAL HERITAGE	Local communities' income generation increased through diversified livelihood activities by 2025 Improved state of cultural heritage by 2023	Annual progress report	Local communities are getting less benefit from the Ramsar site	It is assumed that the visitors' flow will increase which will diversify community investment opportunities
Output 2.1: Adaptive capacity of communities to changing climate around the Ramsar site increased	Communities around the site are aware of their vulnerability to climate change and have developed and implemented simple village adaptation plans compatible with the principle of "wise use" in and around the Ramsar site by 2025	Training reports Compatible village adaptation plan	Some activities are included in BZMP but need to reach a wider audience No vulnerability assessment has been carried out	Communities will explore and adopt nature-based solutions as alternative livelihood options
Output 2.2: Local communities encouraged to preserve and promote their cultural and religious values in and around the Ramsar site	Cultural and religious assets of the site have been maintained, restored and promoted through yearly events and exhibitions, supporting management and additional income for local communities by 2025	Number of renovated sites and seasonal events Village cultural museum	Some events are conducted but not targeted to community investment opportunities Cultural museum concept is included in RNP plan 2020/2025	Importance of cultural and religious values and traditional knowledge will be transferred to younger generation

Project Outcomes/Outputs	Indicators of Achievement	Means of Verification	Baseline	Risks/ Assumptions
Output 2.3: Eco-tourism strategy for the Ramsar site that identifies opportunities for community involvement, private sector engagement, shared benefits and compatibility with the maintenance and improvement of the ecological character of the Ramsar site developed and implemented	Identified and validated relevant activities to strengthen eco-tourism at site-level by 2022 Decreased impact from ecotourism (e.g. pollution and degradation caused by infrastructure) by 2025 Increased income received by community members and the private sector by 2025	Number of visitors' facilities, upgraded trekking trails Promotional video documentary, programmes and websites on the Ramsar site Training reports	Some activities are also included in RNP plan 2020/2026 such as – nature guide training, relocation of hotel, upgrade trekking trails	Nature- friendly tourism promotion and better coordination among interested private sectors
OUTCOME 3: RAMSAR SITE GOVERNANCE, MANAGEMENT AND FUNDING IMPROVED	By 2025, a better coordination and understanding developed among the concerned stakeholders and long-term enforcement and management capacity of park authorities ensured through sustainable financing mechanism	Meeting minutes and annual progress report	Local community representation is established under NPWC Act 2029 BS and Buffer Zone management regulation 2052 BS	Reduced Park-peoples conflict
Output 3.1: Participatory approach strengthened	A Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee (RRMCC) that includes local community representatives meets regularly to discuss and validate the work plan for the management Task Force and to monitor management plan implementation; integrates local concerns and knowledge; and supports a link with the Rara NP management, created by 2022.	Protocol/ guidelines for RRMMC including financial plan Meeting minutes and decisions taken by the committee Training reports	There is BZMC but no specific committee for Rara Lake Ramsar Site No Ramsar related trainings have been organized	Better understanding and coordination mechanism among local communities and park authorities DNPWC will be supportive in taking necessary actions

Project Outcomes/Outputs	Indicators of Achievement	Means of Verification	Baseline	Risks/ Assumptions
Output 3.2: Long-term enforcement capacity of park authorities strengthened	Strengthened or adapted local regulations based on new knowledge such as Spatial monitoring and reporting tool (SMART) patrolling by 2023 Dedicated officer identified within park system by 2022 Improved enforcement capacity through regulation of authorization of BZMC by 2025	Regular and standardized patrol reports SMART data collection protocol and database including designed data model and key patrol parameters Meeting minutes	No SMART patrolling techniques adopted Currently there is no officer dedicated to the Ramsar Site management BZMC conducts meetings but does not effectively regulate the use of resources	Park staff are not transferred frequently and motivated
Output 3.3: Long-term knowledge management capacity of park authorities ensured	By 2021, data management processes and tools established Local authorities are trained on their use by 2021 Knowledge easily available that supports meetings and dialogues around the management plan 2021.	Database software Number of trainings Database reports	No database management system	GoN will ensure the regular maintenance of software and update the database
Output 3.4: Establish innovative and sustainable financing mechanism to ensure reliable source of revenue to promote wetland conservation and local livelihoods	By 2022, sustainable funding strategy in place, identified and approved by stakeholders By 2025, Rara Lake has implemented self-sustaining financing.	Meeting minutes Funding strategy	No meeting organised on funding strategy	Local communities, private sectors and conservation concerns will be interested and actively participate

Project Outcomes/Outputs	Indicators of Achievement	Means of Verification	Baseline	Risks/ Assumptions
OUTCOME 4: AWARENESS AND UNDERSTANDING OF THE IMPORTANCE OF THE RAMSAR SITE AT INTERNATIONAL, NATIONAL AND LOCAL LEVEL ENHANCED	By 2025, the visibility of the Rara Lake Ramsar Site increased	Annual progress report, ICT materials	Hardly any ICT materials developed based on research for promoting ecotourism or community awareness	Better understanding of the site will help to maintain the ecological integrity of the site through people's participation
Output 4.1: Awareness raised through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth	Local wetlands information centre by 2022 Greater understanding of Ramsar amongst local stakeholders through trainings and information boards by 2024 Development and distribution of ICT materials for wider dissemination by 2022 Production of media pieces at national and global level by 2025 Hosting of several events by 2025	Visitors book Information boards ICT materials Conference reports and events Events, media coverage	No information centre established World Wetland Day (WWD) not previously organised, but some promotional activities (Rara Festival)	DNPWC will be supportive in taking necessary actions

5 OPERATIONAL PLAN

The Rara Lake Ramsar Site Management Plan covers a five-year period in which the actions required to achieve the outcomes and maintain the ecological character of the site will take place.

Each activity is broken down to outline the details needed for effective implementation. Details include how to implement, a baseline against which change can be measured, short-term outputs measuring the site's management, longer-term outcomes measuring the wetland environment, indicative schedules, the location of the site it is applicable to, who is responsible, its priority as part of the larger action plan, indicative budgets and assumptions and risks.

Actions are scheduled based on the order in which they need to occur and their level of priority across the five years. The prioritization of actions per half-year period will be done as an annual review.

Indicative budgets have been estimated per activity and sub-activity and will be subject to change as further detailed plans are made and budgets required for additional identified management strategies and technical actions are determined. Periodic reviews and Adaptive Management principles will be applied to the action plan, where systematic improvements will be made based on monitoring and learning. Therefore, the budget and schedule will constantly be refined and evolve based on lived experience.

5.1 WORK PLAN AND BUDGET

Table 4 Work Plan and Budget

Activities	2021	2022	2023	2024	2025	TOTAL BUDGET (NPR)
Activity 1.1.1: Develop and adopt a Terms of Reference (ToR) and financing plan for the Rara Lake management Task Force and assign members						150,000
Activity 1.1.2: Provide park staff and security staff with SMART patrolling and research equipment						5,500,000
Activity 1.1.3: Organize training on patrolling and research techniques						3,000,000
Activity 1.1.4: Strengthen the operationalization of climate monitoring station						200,000
Activity 1.2.1: Map habitats through remote sensing and ground-truthing and develop a comprehensive description of the ecological character of the site, to serve as baseline for monitoring						2,500,000
Activity 1.2.2: Conduct a participatory climate change vulnerability assessment of key species, ecosystems and livelihoods in and around the lake						2,500,000
Activity 1.2.3: Conduct an assessment and monitoring of the population health of the endemic species and migratory and residential birds that use the lake throughout the year						5,000,000
Activity 1.2.4: Conduct an in-depth assessment of the ecosystem services provided by the Ramsar site, including valuation of services and setting the limits of acceptable change in the site while diversifying Income Generating Activities (IGA), and ecotourism services						5,000,000
Activity 1.2.5: Monitor water quality in the lake and update the Rara Lake health report card (HRC)						350,000
Activity 1.2.6: Carry out two R-METT assessments, one in 2022, and one in 2025						1,000,000
Activity 1.2.7: Conduct study on the impact of grazing on the ecosystems and options to strengthen law enforcement, and identify alternative grazing areas around the Ramsar site						100,000
Activity 1.2.8: Update the RIS and revise the boundaries of the Ramsar site (following the watershed)						500,000
Activity 1.2.9: Conduct a study on the geology of Rara lake including any potential outbreak						5,000,000
Activity 1.3.1: Prepare and implement a Snow Trout (Asla) Conservation Action Plan						1,000,000
Activity 1.3.2: Develop and implement habitat management/conservation/restoration work plans based on results and findings of the output 1.2 including limiting the impact of infrastructure on key habitats (e.g. grassland) and restoration of ecosystems (e.g. Forest landscape restoration)						5,150,000

Activities	2021	2022	2023	2024	2025	TOTAL BUDGET (NPR)
Activity 1.3.3: Improve and manage habitats for wetland dependent birds (e.g. roosting and foraging sites), endemic fish species (e.g. fish spawning sites) and other wildlife through the protection of water resources						3,000,000
Activity 2.1.1: Provide training on climate change adaptation for communities and prepare village adaptation plan						1,000,000
Activity 2.1.2: Promote livelihood adaptation and diversification practices						5,000,000
Activity 2.2.1: Maintain and renovate cultural and religious sites						3,000,000
Activity 2.2.2: Organize seasonal events (e.g., local food festival, religious festivals) that increase investment in the community						500,000
Activity 2.2.3: Develop village museum and communication products (videos, exhibitions) including ethnobotanical documentation						2,450,000
Activity 2.3.1: Revise the infrastructure plan at site-level, including potential relocation of hotels, park and army units near the lake, regulating pollution in and around the lake, upgrading visitor facilities, trekking trails and existing route around the lake for cycling and horse riding to control erosion, and construction of hide for birding						26,200,000
Activity 2.3.2: Produce marketing campaign plans						2,600,000
Activity 2.3.3: Train communities on nature guiding, hospitality and homestays, and tourism marketing in collaboration with the private sector						4,000,000
Activity 3.1.1: Develop and adopt a ToR for the Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee (RRMCC) including park authorities, BZMC, local residents, ensuring gender equality and social inclusion						150,000
Activity 3.1.2: Train the Rara Lake Ramsar Site Multi-stakeholder Coordination Committee on the content of the Rara Lake Ramsar Site Management Plan and the Ramsar Convention and organise regular meetings						1,250,000
Activity 3.2.1: Adopt SMART patrolling techniques and regulation						200,000
Activity 3.2.2: Regulate authorization of BZMC for the collection of NTFPs/MAPs						800,000
Activity 3.2.3: Provide training on management of Ramsar site including transparency, rights and benefits sharing to Ramsar Management Unit, Park staff and communities						1,000,000
Activity 3.2.4: Identify a dedicated officer for wetland/ Ramsar management within the park system						20,000

Activities	2021	2022	2023	2024	2025	TOTAL BUDGET (NPR)
Activity 3.2.5: Develop Regulations for Mountain Protected Areas with Ramsar Site						2,500,000
Activity 3.3.1: Establish and maintain data management system and provide training to Ramsar Management Unit, and regulate research permits and activities conducted inside Ramsar site						750,000
Activity 3.4.1: Develop, validate and implement a funding strategy, through consultation with local levels, communities, private sector and public donors						200,000
Activity 4.1.1: Conduct wetlands-related educational programs in communities and schools around the Ramsar site, including a world wetland day celebration at the site						3,500,000
Activity 4.1.2: Promote the Ramsar site through national platforms, media and other regional and international events including the Ramsar COP, IUCN WCC and CBD COP						550,000
Activity 4.1.3: Establish a wetland information centre with displays about the ecology, history and cultural importance of the site and install Ramsar information board throughout the site						3,200,000
Activity 4.1.4: Develop and distribute Information and Communication Technology (ICT) materials						1,200,000
Activity 4.1.5: Develop and implement a Rara Ramsar Site Communication, Education and Public Awareness Plan.						1,500,000

5.2 ACTIVITY DESCRIPTIONS

Outcome 1: Natural resource use is sustainable, and biodiversity is conserved through consistent site monitoring and research

Activity 1.1.1: Develop and adopt a Terms of Reference (ToR) and financing plan for the Rara Lake management Task Force and assign members

Management plan objective: To form and train the Rara Lake management Task Force and to conduct site-specific research management

Stakeholders and key actors:

- DNPWC will constitute to form Rara lake management task force
- RNP will led the process to form the Task Force at the site level.

Action description:

- Meet for provisioning the Task Force at DNPWC Hall
- Workshop will be conducted to develop the TOR and Financial Plan of the Task Force
- RNP will form the Task Force and inform and discuss the TOR

Links with other management actions:
The Task Force is responsible to conduct the research and monitoring of the site which is related to activities of output 1.2 and output 1.3

Location:
The meetings will be held at DNPWC office, Kathmandu and RNP headquarter office, Rara.

Schedule: By the mid-2021, the Task Force is formed with complete TOR and financial plan.

Indicators of Achievement:

The Task Force is provisioned and assign at the site to conduct research and regular monitoring of the site.

Budget:

- NPR 1,00,000 for meeting cost at DNPWC including preparation of TOR -and financing plan of the site Task Force
- NPR 50,000 for the formation of Task Force and to inform and discuss TOR and financial plan.

Total cost = NPR 150,000

Activity 1.1.2: Provide park staff and security staff with SMART patrolling and research equipment

Management plan objective: To form and train the Rara Lake management Task Force and to conduct site-specific research management

Stakeholders and key actors:

The activity will be the responsibility of DNPWC with the support from Nepal Army, and Conservation Partners.

Action description:

SMART patrolling equipment

The SMART tool is a widely adopted best practice tool to better monitor, evaluate and adaptively manage patrolling techniques. It includes a powerful software application that improves the ability of park authorities to combat illegal activities with limited resources. It motivates park and army staff in their day-to-day work; empowers park managers with timely and accurate information; guides park managers in using the collected information strategically to better plan and manage their patrolling operations and ensure accountability and good governance.

- The park will be provided with the necessary field equipment for collecting and managing patrol data, such as computer, GPS units, batteries, battery chargers, power source etc.
- SMART phones with special application (ecological monitoring and intelligence data collection) will collect field data for use with SMART analysis
- The permanent computer will be fixed at the site level which is operated by trained and skilled Park staff (dedicated officer for wetland management)
- Install the SMART software and application in the monitoring computer.

Water quality parameter test kit and other research equipment

The park is provided with a water quality parameter test kit. The Task Force will be responsible for monitoring the water quality of Rara Lake and updating it in every three months.

Links with other management actions:

This equipment provided will support the Task Force to conduct research and monitoring

Location: The equipment purchased will be delivered to RNP.

Schedule:

- By the end of 2021, water quality test instrument is purchased and delivered to RNP
- By the end of 2021, SMART patrolling equipment is purchased and delivered to RNP

Indicators of Achievement:

The equipment received helps the Task Force and park staff in effective patrolling, regular monitoring and conducting some rapid ecological assessment, including water quality tests.

Budget:

- NPR 1,500,000 for purchasing water quality test instrument
- NPR 500000 for purchasing software and applications
- NPR 3,000,000 for SMART patrolling equipment (such as computer, GPS units, night vision binoculars, SMART phones, batteries)
- NPR 500000 for Task Force field gear.

Total cost = NPR 5,500,000

Activity 1.1.3: Organize a training session on patrolling and research techniques

Management plan objective: To form and train the Rara Lake management Task Force and to conduct site-specific research management

Stakeholders and key actors:

- DNPWC in coordination with Nepal Army will be responsible for conducting this activity with technical support from conservation partners (BCN, WWF, ZSL, IUCN, Panthera), assisted by RNP at the site.
- The Task Force including other frontline staff and ecological monitoring staff are the participants.

Action description:

The experience and knowledge of SMART adaptive management approach from other protected areas, such as Chitwan National Park, will be used to introduce SMART, and organise training to mobilize Task Force.

- The content and structure of the course will be designed to cover the field data collection using patrol forms, using GPS for navigation, data recording on handheld devices using smartphones and SMART mobile, a special application
- Experts/ consultancy services will be hired to provide training sessions
- At least six staff will be trained in water quality research and equipment handling and reporting
- Refresher training sessions will be conducted every two years, to keep the task force up to date.

Links with other management actions:

This activity is interconnected with the activities of outcomes 1 & 2.

Location:

The training will be organised at the Park headquarters, Rara, with field practices at the site.

Schedule:

By the end of 2022, all the training sessions are conducted, and the task force is in operation.

Indicators of Achievement:

- The Task Force is well trained on SMART patrolling and management approach
- The advanced and improved knowledge of the Task Force, including the other park staff, helps in maintaining the ecological characteristics of the site
- The water health report card is updated regularly.

Budget:

- NPR 1,000,000 for consultancy services for designing training course modules and fees
- NPR 2,000,000 for all training expenses (including materials, travel, food and accommodation)

Total cost = NPR 3,000,000

Activity 1.1.4: Strengthen the operationalization of climate monitoring station

Management plan objective: To form and train the Rara Lake management Task Force and to conduct site-specific research management

Stakeholders and key actors:

- The operationalization of climate monitoring stations will be undertaken in coordination and collaboration with Department of Hydrology and Meteorology.
- The Task Force will regularly update the record of climate data (temperature and precipitation).

Action description: A meeting will be held with DHM to explain the operation and function of the climate monitoring station, and the Task Force will be trained accordingly.

Links with other management actions: This activity supports research and helps in taking management decisions.

Location:

The training will be organised at the Park headquarters, Rara, with field practices at the site.

Schedule: By the end of 2021, all the training sessions are conducted.

Indicators of Achievement:

The Task Force is well trained on the operation and functioning of the climate monitoring station and is able to update the record.

Budget: NPR 200,000 for meetings with stakeholders including DHM.

Total cost = NPR 200,000

Activity 1.2.1: Map habitats through remote sensing and ground-truthing and develop a comprehensive description of the ecological character of the site, to serve as baseline for monitoring

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- DNPWC in coordination with RNP will be responsible for conducting this activity
- This activity requires GIS specialist/consultant who will be assisted by the Task Force.

Action description:

Habitat mapping is important to better understand the distribution and extent of the habitats. It visualises the relationship or impact caused by human activities and helps in identification of research needs related to management of biodiversity. It can be used as a tool for conservation and sustainable use of resources.

- GIS specialist will be hired and Task Force will support the specialist in ground truthing.
- A detailed study will be carried out to develop a comprehensive description of the ecological character of the site.
- Based on the study, an illustrative habitat map will be prepared.
- The habitat map produced will serve as a baseline for monitoring.
- A workshop will be organised to present the map.

Links with other management actions:

Based on the findings of this activity, Outcome 2 activities will be designed and implemented

The field work can be done together with biodiversity survey.

Location: Rara Lake Ramsar Site

Schedule:

- Prepare TOR for the GIS specialist and hire by early 2021.
- By the end of 2021, an illustrative habitat map will be prepared

Indicators of Achievement: The park has a detailed illustrative habitat map that helps in conservation of habitat in the Ramsar Site.

Budget:

- NPR 2,000,000 for consultancy services.
- NPR 450000 for field work, includes travel, food, and accommodation.
- NPR 50,000 for organising workshop to present the maps.

Total cost = NPR 2,500,000

Activity 1.2.2: Conduct a participatory climate change vulnerability assessment of key species, ecosystems and livelihoods in and around the lake

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- DNPWC will be responsible to conduct this activity
- This activity requires a biodiversity expert and other consultant who will be assisted by the Task Force
- Communities will be involved during the process.

Action description:

- Consultants will be hired
- A detailed study will be carried out on climate change vulnerability assessment, a participatory approach will be adopted
- During the assessment process the Task Force will also be trained
- Workshops will be organised to present the findings.

Links with other management actions

Based on the findings of this activity, Outcome 2 activities will be designed and implemented.

Location: Rara Lake Ramsar Site

Schedule:

- Prepare TOR for the Consultancy services by early 2021.
- By the end of 2021, a detailed report will be prepared and presented

Indicators of Achievement: The park has gained knowledge on climate change vulnerability and plans activities accordingly.

Budget:

- NPR 2,000,000 for consultancy services
- NPR 450,000 for field work, includes travel, food, accommodation
- NPR 50,000 for organising workshop to present the maps.

Total cost = NPR 2,500,000

Activity 1.2.3: Conduct an assessment and monitoring of the population health of the endemic species and migratory and residential birds that use the lake throughout the year

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- DNPWC will be responsible to conduct this activity
- This activity requires a fish biologist and ornithologist who will be assisted by the Task Force.

Action description:

- Experts (consultants) will be hired
- A detailed survey of endemic fishes and a frog species will be conducted
- A detailed survey of the migratory and residential birds will be conducted
- Monitoring guidelines will be developed and operational
- Findings of the assessment will be presented.

Links with other management actions: The fish biologist and ornithologist will work in close coordination with GIS specialist to map the habitat of these species.

Location: Rara Lake and its catchment

Schedule:

- Prepare TOR for the Consultancy services by early 2021
- By the end of 2021, and detailed report will be prepared and presented.

Indicators of Achievement:
The park has gained detailed knowledge on endemic species and water birds.

Budget:

- NPR 4,500,000 for consultancy services
- NPR 450,000 for field work, includes travel, food, accommodation
- NPR 50,000 for organising workshop to present the findings.

Total cost = NPR 5,000,000

Activity 1.2.4: Conduct an in-depth assessment of the ecosystem services provided by the Ramsar site including valuation of services and setting the limits of acceptable change in the site while diversifying IGA, and ecotourism services.

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- DNPWC will be responsible to conduct this activity
- This activity requires a fish resource economist with expertise in assessing ecosystem services who will be assisted by the Task Force.

Action description:

The detailed assessment of ecosystem services will assist in planning the use of area. This process is really challenging and difficult since there are multiple factors to be analysed and compared. It includes bio-physical assessment, social assessment, and economic assessment. Setting limits of acceptable change is challenging as it requires sufficient data and better understanding of ecological characterises. It is helpful to Ramsar site managers to understand the ecological character of wetland. This will help site managers to monitor the site, identify management actions and determine limitations to activities to maintain the ecological character of the site. The resource economist needs to work closely with GIS experts and other consultants hired, to acquired knowledge on ecological characteristics of the Ramsar site.

- Prepare TOR for consultancy service and hire consultant.
- Meet with all other consultants to acquire knowledge generated. The process is facilitated by DNPWC.
- A detailed study will be carried out on the ecosystem services.
- Detailed report will be prepared by consultant, including limits of acceptable change in the site when diversifying IGA and ecotourism services such as horseriding boating and cycling.
- A workshop to present the findings of the assessment will be organised.

Links with other management actions: This activity requires various data, thus there is a need to work closely with other consultants.

Location: Ramsar site and its surrounding area.

Schedule:

- Prepare TOR for the Consultancy services by early 2023
- By the end of 2023, and detailed report will be prepared and presented.

Indicators of Achievement: Based on the valuation of ecosystem services, the park has defined the limits of acceptable changes, and the services are provided accordingly.

Budget:

- NPR 4,500,000 for consultancy services
- NPR 450,000 for field work, includes travel, food, accommodation
- NPR 50,000 for organising workshop to present the findings.

Total cost = NPR 5,000,000

Activity 1.2.5: Monitor water quality in the lake and update the Rara Lake health report card (HRC).

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

DNPWC will lead the process with technical support from Conservation Partners.

Action description:

- Water quality monitoring initiated
- Guideline and protocol of health report card prepared and adopted
- HRC baseline initiated, updated at least once in a two-year period and displayed in strategic locations.

Links with other management actions: This activity depends on the activity 1.1.1 & 1.1.3.

Location: Rara Lake

Schedule:

- By 2021 Rara Lake HRC guidelines and protocol will be adopted and Rara Lake HRC baseline initiated
- The HRC of the Rara Lake will be at least once in every two-year period.

Indicators of Achievement: The health of the Rara lake Base line is initiated and updated regularly.

Budget:

- NPR 250,000 for the workshops to prepare guidelines and protocol of HRC
- NPR 100,000 for baseline initiation and update of HRC at least once in two years period.

Total cost = NPR 350,000

Activity 1.2.6: Carry out two R-METT assessments, one in 2022, and one in 2025

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- RNP will lead the process with technical support from IUCN
- All the concerned stakeholders will participant during the assessment process.

Action description:

- R-METT is carried out to develop a baseline on current management effectiveness
- Workshop will be organised and all concerned stakeholders including community leaders, government staff and RRMMC, as well as education, tourism and business sectors will be invited
- This will be followed by the assessment process, addressing different sections of the R-METT including site threats, management and governance processes, and reviewing the status of Ramsar criteria
- Activities will be detailed to improve the management of the Ramsar Site
- A workshop will be organised to present the findings of the assessment
- R-METT will be conducted every two years.

Links with other management actions

The results and findings obtained from other activities support the assessment process.

Location: RNP headquarters office

Schedule: Two assessment will be carried out in between 2021 – 2025.

Indicators of Achievement:

The Ramsar site management effectiveness has been assessed with a recognised tracking tool by the Ramsar convention.

Budget: NPR 1000,000 for the two assessments.

Total cost = NPR 1,000,000

Activity 1.2.7: Conduct study on the impact of grazing on the ecosystems and options to strengthen law enforcement and identify alternative grazing areas around the Ramsar site

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors: RNP will be responsible to carry out this activity.

Action description:

Assessment of grasslands and alternative measures to reduce pressure on rangeland.

Links with other management actions: The results and findings of activity 1.2.1 & 1.2.4 will help identify the alternative grazing areas around the Ramsar site.

Location: Rara lake Ramsar site and its surrounding areas.

Schedule: By the end of 2021, a detailed report on impacts of grazing and alternative areas will be prepared.

Indicators of Achievement:

The grassland within the Ramsar site conserved through SMART patrolling, and alternative grazing areas provided to reduce the impact of unmanaged grazing.

Budget: NPR 100,000 for field survey.

Total cost = NPR 100,000

Activity 1.2.8: Update the RIS and revise the boundaries of the Ramsar site (following the watershed).

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors: DNPWC will be responsible to update RIS.

Action description:

- RIS needs to be reviewed and updated every six years by the national Ramsar management authority
- DNPWC will proceed to update the RIS by sending a request email to Ramsar secretariat
- RIS will be updated and sent to Ramsar secretariat for approval.

Links with other management actions:

The R-METT assessment and other research findings will provide information to update RIS.

Location: Rara Lake Ramsar Site and its surrounding areas

Schedule: By the end of 2025, RIS will be revised and updated.

Indicators of Achievement:

By the end of 2025, RIS with the revision on boundaries (following watershed) is updated.

Budget: NPR 500,000 for preparing updated RIS sheet.

Total cost = NPR 500,000

Activity 1.2.9: Conduct a study on the geology of Rara Lake including any potential outbreak

Management plan objective: To strengthen the knowledge and monitoring of ecological features of the Ramsar site.

Stakeholders and key actors:

- RNP will lead the process
- RNP will collaborate with universities/Department of Geology to conduct the study.

Action description:

- Experts (consultants) will be hired
- A detailed survey of the geology of Rara Lake including its potential outbreak will be conducted
- The findings of the assessment and detailed report will be presented and submitted.

Links with other management actions: Based on the findings of this assessment, habitat management and ecosystem restoration activities will be designed.

Location: Rara Lake and its catchment.

Schedule:

- Prepare TOR for the Consultancy services by early 2021
- By the end of 2021, a detailed report will be prepared and presented.

Indicators of Achievement: The park has gained detailed knowledge on the geology of Rara Lake.

Budget:

NPR 5,000,000 for consultancy services (including all expenses like food and accommodation, workshop cost, field survey and fee).

Total cost = NPR 5,000,000

Activity 1.3.1: Prepare and implement a Snow Trout Conservation Action Plan

Management plan objective: To restore and conserve the key ecological features of the Ramsar site.

Stakeholders and key actors:

- DNPWC will be responsible to carried out this activity.
- A consultant team will be hired to prepare the action plan
- Local communities residing around the Ramsar Site and all concerned stakeholders will participate in the plan preparation process.

Action description:

Endemic fishes are the key aquatic species of the Rara Lake Ramsar Site. Based on the results of the studies (activity 1.2.3), with a focus on fish conservation zones (temporary or permanent no-access zones on refuges, spawning and feeding habitats), strict enforcement of the no-fishing regulation and ecosystem management will be maintained, to ensure natural hydrology and water quality.

- Prepare TOR and hire consultants
- Conduct a series of workshops at different level as a process of consultation
- Prepare and present Snow Trout Conservation Action Plan, and get it endorsed by DNPWC for implementation.

Links with other management actions:

The results and findings obtained from activity 1.2.3 will provide information to prepare this action plan.

Location: Field survey in Rara Lake Ramsar Site and its surrounding areas. The workshops will be conducted at central, provincial and site level.

Schedule: The snow trout conservation action plan will be prepared by 2023.

Indicators of Achievement:

The endemic fish species of Rara Lake is conserved through implementation of the snow trout conservation action plan.

Budget: NPR 1,000,000 for the preparation of the action plan

Total cost = NPR 1,000,000

Activity 1.3.2: Develop and implement habitat management/ conservation/ restoration work plans based on results, including limiting the impact of infrastructure on key habitats (e.g. grassland) and restoration of ecosystems (e.g. forest landscape restoration).

Management plan objective: To restore and conserve the key ecological features of the Ramsar site.

Stakeholders and key actors:

- RNP will be responsible for conducting this activity
- The potential collaborators for this activity are conservation partners, local and provincial government.

Action description:

- The target species habitat management plan will be prepared for implementation, based on the results and findings of the activity of output 1.2
- Detailed activities will be designed as per the illustrative habitat maps and recommendation from the research reports
- The restoration site/s (grassland, forest, water resources) will be identified and prioritized for implementation
- Regular monitoring will be conducted and reports prepared.

Links with other management actions: The result and findings of output 1.2 provide information to identify and prioritize the habitat restoration sites.

Location: Rara Lake Ramsar Site.

Schedule:

- By 2022, the habitat restoration sites are identified and prioritized
- Detailed activities / work plan will be prepared and implemented from 2023.

Indicators of Achievement: The degraded habitats are restored and conserved through implementation of detailed work plan.

Budget:

NPR 1,50,000 for meeting/ workshop

NPR 50, 00,000 for development and implementation of work plan.

Total cost = NPR 5,150,000

Activity 1.3.3: Improve and manage habitats for wetland-dependent birds (e.g. roosting and foraging sites), endemic fish species (e.g. fish spawning sites) and other wildlife, through the protection of water resources.

Management plan objective: To restore and conserve the key ecological features of the Ramsar site.

Stakeholders and key actors:

RNP will be responsible for conducting this activity with technical support of IUCN.

Action description:

Based on the results and findings of the activity of output 1.2, an integrated water management approach will be adopted for the protection of water resources

A workshop to prioritize the site and identify the detailed activities will be held

Water resources in the identified habitats will be protected.

Links with other management actions

Location: Rara Lake Ramsar site.

Schedule: Identify and prioritize the list of activities by 2022 and implement from 2023.

Indicators of Achievement:

The water resources of the Rara Lake Ramsar site are protected and habitats for wetland dependent birds and other wildlife are improved and managed

At least 10 sites are improved and managed through protection of water resources.

Budget: NPR 3,000,000 for implementation of water resources protection.

Total cost = NPR 3,000,000

Outcome 2: Livelihood/ income sources secured and diversified for local communities, protecting the cultural and natural heritage

Activity 2.1.1: Provide training on climate change adaptation for communities and prepare village adaptation plan.

Management plan objective: To increase the adaptive capacity of communities to changing climate around the Ramsar site.

Stakeholders and key actors:

- RNP in collaboration with local government will be responsible for carrying out this activity
- All the community residing around the Ramsar site will participate in the training.

Action description:

- Prepare TOR for hiring capacity building experts
- Design training course content and program schedule
- Capacity building training on climate adaptation will be provided to all the participants living around the Ramsar site
- Prepare village adaptation plan
- Refresher training will be organized for progress tracking, as well as for assessing problems and constraints with climate vulnerability.

Links with other management actions:

This activity supports the carry out the activity 2.1.2

Location: Communities living nearby the Ramsar site.

Schedule: The training will be conducted by the end of 2022 and village adaptation plan implemented from 2023.

Indicators of Achievement:

The people living around the Ramsar site are aware about the changing climate and have implemented a village adaptation plan.

Budget:

- NPR 500,000 for consulting service including preparation of village adaption plan
- NPR for 500,000 for organising training and necessary consultation to prepare plan.

Total cost = NPR 1,000,000

Activity 2.1.2: Promote livelihood adaptation and diversification practices.

Management plan objective: To increase the adaptive capacity of communities to changing climate around the Ramsar site.

Stakeholders and key actors: RNP will support the community to conduct this activity.

Action description:

Community livelihood adaptation and diversification practices will be promoted based on the results of the vulnerability assessment (including water management for agriculture and consumption, crop diversification and capacity building for tourism). A village adaption plan will be implemented with support from RNP and local government.

- Five training programs will be organized for developing technical capacity of communities/groups to implement IGA business plan.
- One agriculture and tourism cooperative or group will be established for the sustainability of financial and progress monitoring.
- Financial subsidies/incentives will be provided for implementing IGA Business Plan.
- IGA will be monitored quarterly for income enhancement.

Links with other management actions:

The village adaptation plan (activity 2.1.1) will help to prioritize the IGA business plan.

Location: Communities living nearby the Ramsar site.

Schedule:

- All the trainings will be completed by 2023
- Cooperative established by 2024.

Indicators of Achievement:

The adaptive capacity of community is improved through increased technical capacity to implement IGA business plan.

Budget:

- NPR 2,000,000 for organising training
- NPR 3,000,000 for financial subsidies to implement IGA business plan.

Total cost = NPR 5,000,000

Activity 2.2.1: Maintain and renovate cultural and religious sites

Management plan objective: To encourage the local communities to preserve and promote their cultural and religious values in and around the Ramsar site.

Stakeholders and key actors: RNP will support the community to conduct this activity.

Action description:

- Workshop/ meetings for prioritizing the cultural and religious sites for renovation will be held
- Cultural and religious sites will be renovated and regularly maintained.

Links with other management actions:

This activity will maintain the cultural and religious values of the Ramsar site and contribute to tourism promotion.

Location:

Cultural and religious sites within Rara Lake Ramsar Site (such as Chhapru Mahadev, Rara Mahadeva, Thakurnath Mahadeva, Laguda and Dopheshwar Mahadeva, Rara Masto, Chhapru Masto, Rara Kuldevata, Dofya Mahadev).

Schedule: By the end of 2024, the cultural and religious site will have been renovated.

Indicators of Achievement:

The cultural and religious site of the Ramsar site is maintained and renovated.

Budget: NPR 3,000,000 for maintenance and renovation.

Total cost = NPR 3,000,000

Activity 2.2.2: Organize seasonal events (e.g. local food festival, religious festivals) that increase investment in the community

Management plan objective: To encourage the local communities to preserve and promote their cultural and religious values in and around the Ramsar site.

Stakeholders and key actors:
RNP will support the community to conduct this activity. The province and local government will also assist in organizing events.

Action description:

Meeting of stakeholders to organize seasonal events will be held

A meeting with private sector, RRMMC and locals will be coordinated, to support events that promote investment opportunities.

Links with other management actions: Such events will assist in generating the IGA business plan and promote ecotourism.

Location: Rara Lake Ramsar Site

Schedule: Seasonal events will be organized once a year.

Indicators of Achievement:

The local products are promoted through seasonal events, and the private sector is attracted to invest in the community.

Budget: NPR 500,000 for organising seasonal events.

Total cost = NPR 500,000

Activity 2.2.3: Develop village museum and communication products (videos, exhibitions) including ethnobotanical documentation

Management plan objective: To encourage the local communities to preserve and promote their cultural and religious values in and around the Ramsar site.

Stakeholders and key actors:

- Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee with support from RNP, NTB and local government
- Conservation partners will be potential collaborators for documentation.

Action description:

- A meeting with stakeholders including local government and community people, to introduce and discuss the activity, will be held
- Ethnobotanical, traditional knowledge and skills will be documented and presented in village museum
- Guidelines and protocol of the village museum concept will be prepared
- Village Cultural Museum will be developed.

Links with other management actions:

The village museum concept will assist in generating the IGA business plan and promote ecotourism.

Location: Murma Village

Schedule:

- By 2023 the community will be prepared to develop a village museum and develop guidelines and protocols
- By 2024 a Village Cultural museum will have been developed.

Indicators of Achievement: The community benefits from the operation of village cultural museum.

Budget:

- NPR 250,000 for meetings
- NPR 200,000 for ethnobotanical documentation
- NPR 2,000,000 for development of village cultural museum.

Total cost = NPR 2,450,000

Activity 2.3.1: Revise the infrastructure plan at site-level, including potential relocation of hotels, park and army units near the lake, regulating pollution in and around the lake, constructing a hide for birding, and upgrading visitor facilities, trekking trails and the existing route around the lake for cycling and horse riding to control erosion.

Stakeholders and key actors:

RNP will be responsible for conducting this activity in coordination and collaboration with local, provincial government and concerned development partners.

Action description:

- A meeting with stakeholders including local and provincial government and development partners to revise the infrastructure plan eco-friendly will be held
- A workshop for the development of pollution management mechanism will be conducted
- Pollution negation information boards and notices will be placed in strategic spots and hotel and accommodation centres
- Materials and equipment for solid waste collection and disposal sites will be placed
- Pollution monitoring practices will be put into practice
- Workshops/meetings for revising and prioritizing the infrastructure plan will be held
- Visitor facilities, trekking trails and existing route around the lake will be upgraded
- A hide for birding will be constructed.

Links with other management actions:

This activity will regulate the solid waste generated from visitors and communities, and eco-friendly infrastructure will help to maintain the ecological integrity of the site.

Location: Rara Lake Ramsar Site

Schedule:

- Meeting with stakeholder by 2021 for the development of pollution regulation
- Upgrade visitors' facilities including hide for birding by 2024
- Develop and implement pollution management mechanisms by 2023.
- Develop and approve exit plan of hotel, park and army unit by 2021.
- Initiate the construction of infrastructures of park and army unit by 2022 and continue in each year.

Indicators of Achievement:

The infrastructure plan is revised that helps in maintaining the integrity of the ecological character, and visitors are provided with better facilities.

Budget:

- NPR 1,000,000 for workshops for the development of pollution regulation mechanism including installations of disposal bins and information boards
- NPR 200,000 for meetings for revising the infrastructure plan including relocation of hotels, park and army unit.
- NPR 100,00,000 for upgrading trekking trails and visitors' facilities and existing route around the lake
- NPR 5,000,000 for construction of hides for birding.
- NPR 10,000,000 for the construction of park and army unit infrastructures.

Total cost = NPR 26,200,000

Activity 2.3.2: Produce marketing campaign plans

Management plan objective: To develop and implement an eco-tourism strategy for the Ramsar site that identifies opportunities for community involvement, private sector engagement, shared benefits and compatibility with the maintenance and improvement of the ecological character of the Ramsar site.

Stakeholders and key actors:

The process will be led by Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee with support from RNP, in coordination with NTB, BZMC, local and provincial government and the tourism industry.

Action description:

- Workshop/meetings with stakeholders for producing and marketing campaign plans will be held
- Advertisement and awareness programs will be broadcasted through different communication systems such as radio, television and social media
- Rara Lake Ramsar Site website will be developed
- One promotional video documentary will be developed and broadcast.

Links with other management actions

This activity will promote the site to a wider audience and support and diversify the IGA.

Location: Nationally and internationally.

Schedule:

- Meetings conducted by 2022
- By 2023, campaign plans will be developed with promotional video documentary broadcast through different media.

Indicators of Achievement:

The Rara Lake Ramsar site is well presented to a wider audience through different media.

Budget:

- NPR 100,000 for meetings
- NPR 1,000,000 for advertisement and broadcasting
- NPR 1,000,000 for developing promotional video documentary
- NPR 500,000 for developing website.

Total cost = NPR 2,600,000

Activity 2.3.3: Train communities on nature guiding, hospitality and homestays, and tourism marketing in collaboration with the private sector

Management plan objective: To develop and implement an eco-tourism strategy for the Ramsar site that identifies opportunities for community involvement, private sector engagement, shared benefits and compatibility with the maintenance and improvement of the ecological character of the Ramsar site.

Stakeholders and key actors:

- RNP will be responsible for conducting this activity in coordination with RRMMC
- Communities residing around the site will benefit from the training.

Action description:

- A meeting with stakeholders to plan the training for each year will be held
- 5 training sessions will be conducted over the 5-year period
- Experts will be hired, depending on the nature of training.

Links with other management actions: This activity will support promotion of ecotourism.

Location: Park headquarters

Schedule: Different training sessions will be conducted by 2023.

Indicators of Achievement:
The communities are prepared to promote tourism business, and the private sector is attracted to invest in the community.

Budget: NPR 4,000,000 for organising five training sessions.
Total cost = NPR 4,000,000

Outcome 3: Ramsar site governance, management and funding are

Activity 3.1.1: Develop and adopt a ToR for the Rara Lake Ramsar Site Multi-stakeholder Coordination Committee (RRMCC) including Park authorities, BZMC and local residents, that ensures gender equality and social inclusion.

Management plan objective: To strengthen and implement a participatory approach for the conservation and management of Rara Lake Ramsar Site

Stakeholders and key actors:

- DNPWC will provide approval of the Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee
- RNP will lead the process to form the Management Committee at the site level.

Action description:

- A meeting for commissioning RRMMC at DNPWC will be held
- A workshop will be conducted to develop the TOR and Financial Plan of the RRMMC
- RNP will meet with concerned stakeholders including BZMC, communities residing around the Ramsar site, tourism and travel agencies and local government, and will form the RRMMC or improve the existing committee (for example BZMC) if management authority think it works and will provide additional TOR specific to management of the Ramsar Site.

Links with other management actions:
The RRMMC will be responsible for monitoring and implementation of the management plan

Location:

The meetings will be held at DNPWC office, Kathmandu, and RNP headquarter office, Rara.

Schedule:
By the mid of 2021, Rara Lake Ramsar Site Steering Committee is formed with complete TOR and financial plan.

Indicators of Achievement:

The dedicated site conservation and protection committee is formed that regularly monitors the management plan to ensure the activities are conducted to achieve its management goal.

Budget:

- NPR 100,000 for meeting cost at DNPWC including preparation of TOR and financing plan of the RRMMC
- NPR 50,000 for the formation of RRMMC and to inform and discuss TOR and financial plan.

Total cost = NPR 150,000

Activity 3.1.2: Train the Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee (RRMCC) on the content of the Rara Lake Ramsar Site Management Plan and the Ramsar Convention and organise regular meetings

Management plan objective: To strengthen and implement a participatory approach for the conservation and management of Rara Lake Ramsar Site

Stakeholders and key actors:

- The training will be the responsibility of DNPWC, assisted by RNP at site-level with technical support from IUCN.
- The participants of the training will be the members of RRMCC, task force and the park authorities.

Action description:

- Experts/ Consultants will be hired with the knowledge on management of Ramsar site including Ramsar Convention.
- The training modules and schedules will be designed to train the RRMCC, task force and park authorities.
- The RRMCC will meet half yearly to review the site management plan implementation and conservation concerns.

Links with other management actions: This activity will be conducted together with activity 1.1.2.

Location: The training will be conducted at park headquarter office, Rara.

Schedule: By 2022, trainings will be conducted.

Indicators of Achievement:

- The committee is well-informed and trained on the implementation of Ramsar site management plan than enables committee to better understand the problems, issues, gaps, analyse it and manage Ramsar Site with strategic approach
- The RRMCC met regularly to review the status of implementation of management plan
- The meeting serves as a platform to discuss potential solution for existing issues with participatory approach.

Budget:

- NPR 500,000 for the participants and experts travel, food and accommodation, and necessary training materials.
- NPR 500,000 for the expert's fees/ consultancy services.
- NPR 250,000 for the regular meetings.

Total cost = NPR 1,250,000

Activity 3.2.1: Adopt SMART patrolling techniques and regulations

Management plan objective: To strengthen long-term enforcement capacity of park authorities.

Stakeholders and key actors : DNPWC will be responsible for this activity with support from the Nepal Army and Conservation Partners.

Action description:

The SMART tool is a widely adopted best practice tool to better monitor, evaluate and adaptively manage patrolling techniques. It includes a powerful software application that improves the ability of park authorities to combat illegal activities with limited resources. It motivates park and army staff in their day-to-day work, empowers park managers with timely and accurate information and guides park managers in using the collected information strategically to better plan and manage their patrolling operations and ensure accountability and good governance

- Approval from DNPWC to adopt SMART will be obtained
- The RNP will be introduced to SMART and prepared for SMART implementation that includes: designing the data model and collection protocols; configuring the SMART database; defining responsibilities; monitoring the program; developing clear time tables for implementation and a reporting procedure.
- Adequate resources will be ensured to operate patrols, including patrol mission costs.

Links with other management actions:

This activity is linked with activity 1.1.3. The Task Force including other park staff will be trained on SMART.

Location: The SMART database operation will be at the park headquarters.

Schedule:

- By 2022, DNPWC will approve the adoption of SMART
- By 2023, SMART will be introduced with proper trainings to Task Force and SMART implemented.

Indicators of Achievement: The park uses SMART to store data, patrol, and identify conservation hotspots.

Budget: NPR 200,000 for preparing SMART implementation.

Total cost = NPR 200,000

Activity 3.2.2: Regulate authorization of BZMC for the collection of NTFPs/MAPs

Management plan objective: To strengthen long-term enforcement capacity of park authorities.

Stakeholders and key actors:

RNP in coordination with BZMC and RRMMC will be responsible for conducting this activity.

Action description:

- Workshops and meetings for conservation and management of NTFPS/MAPS and an equitable benefit sharing mechanism will be adopted, and the income of the community will be increased
- Meetings will be conducted as per the park management rules.

Links with other management actions:

This activity will encourage community participation in conservation of the site and improve governance and benefit sharing mechanisms.

Location: Meetings will be conducted at park office.

Schedule: Quarterly meetings or as needed.

Indicators of Achievement: The authorization of collection of NTFPs/MAPS is regulated through routine meetings and monitoring.

Budget: NPR 8, 00,000 for conducting quarterly meeting.

Total cost = NPR 800,000

Activity 3.2.3: Provide training on management of Ramsar site including transparency, rights and benefit-sharing to Ramsar Management Unit, park staff, and communities.

Management plan objective: To strengthen long-term enforcement capacity of park authorities.

Stakeholders and key actors:

- The training will be the responsibility of DNPWC, assisted by RNP at site-level
- All the communities residing around the Ramsar site, park authorities, RRMMC and BZMC will participate in the training.

Action description:

- Experts/consultants will be hired who have knowledge on management of Ramsar sites including transparency, rights and benefit-sharing
- The training modules and schedules will be designed to train the communities residing around the site, park authorities, RRMMC and BZMC.

Links with other management actions: This activity will improve transparency, rights and benefits-sharing, which will strengthen the co-management approach.

Location: The training will be conducted at park headquarter office, Rara.

Schedule: By the end of 2022, training will be provided.

Indicators of Achievement:

The key stakeholders including communities, park authorities are trained and well-informed on good governance and benefit sharing mechanisms.

Budget:

- NPR 500,000 for the participants' and experts' travel, food and accommodation, and necessary training materials.
- NPR 500,000 for the experts' fees/consultancy services.

Total cost = NPR 1,000,000

Activity 3.2.4: Identify a dedicated officer for wetland/Ramsar management within the Park system

Management plan objective: To strengthen long-term enforcement capacity of park authorities.

Stakeholders and key actors:

- DNPWC will provision to enrol a dedicated officer for Ramsar site management within the park system
- RNP will identify the dedicated officer among the park staff who will be responsible for the functioning of the wetland information center and will plan and monitor the site Task Force.

Action description:

- Meet with secretary of MoFE, DNPWC authorities to agree enrolling a dedicated officer for Ramsar site management within the park system and identification of him/her by the park itself.
- Circulate the decision to identify and enroll a dedicated officer for wetland management by DNPWC to the site in charge
- The Park will identify and appoint a dedicated officer, communicate the information and introduce him/her to all concerned authorities including provincial and local government.

Links with other management actions:

- The established Wetland information centre will be operated by an appointed dedicated officer
- He/she will closely plan and monitor the Task Force and coordinate and update the RRMMC
- The dedicated officer will also support SMART operations.

Location: The dedicated officer will be located at the wetland information centre established within park premises.

Schedule: By the end of 2021, DNPWC will be provisioned to enroll a dedicated officer and the park will identify and appoint this officer.

Indicators of Achievement:

- The wetland information centre is well appointed and operated by a responsible and dedicated wetland officer
- All the activities conducted on the Ramsar site are closely monitored and information is updated regularly.

Budget: NPR 20,000 for food during meetings.

Total cost = NPR 20,000

Activity 3.2.5: Develop regulations for mountain protected areas with Ramsar site

Management plan objective: To strengthen long-term enforcement capacity of park authorities.

Stakeholders and key actors: DNPWC will lead the activity in coordination with concerned stakeholders.

Action description:

- A meeting with the Minister, secretary of MoFE and DNPWC authorities will be held, to agree on developing regulations for mountain protected areas with Ramsar site
- A team to draft the regulation will be formulated
- Regulation in consultation with concerned ministries, departments, conservation organisation and other concerned stakeholders will be drafted
- The draft regulation will be presented and discussed
- The draft regulation will be finalised and approved.

Links with other management actions: The Ramsar regulation will guide activities conducted inside the Ramsar Site within the mountain protected areas.

Location: Ramsar Site within Mountain Protected areas, Nepal.

Schedule:
By the end of 2023, regulation for mountain protected areas with Ramsar site will be drafted.

Indicators of Achievement: The regulation is drafted and submitted for approval.

Budget: NPR 2,500,000 for meetings, consultation and drafting regulations.

Total cost = NPR 2,500,000

Activity 3.3.1: Establish and maintain data management system (e.g. database and GIS) and provide training to park staff, and regulate research permits and activities conducted inside Ramsar Site.

Management plan objective: To ensure long-term knowledge management capacity of park authorities.

Stakeholders and key actors:

- DNPWC will play a lead role in establishing the database management system
- Ramsar Management Unit will assist to establish the system at the site.

Action description:

- Workshop/meetings for establishing database management system will be held at DNPWC office
- Ramsar Management Unit led by an officer dedicated to wetland management will assist to establish a data management system at site
- Different templates and software will be developed to store data systematically
- Ramsar Management Unit will be trained to maintain and operate the system
- The Wetland Management Officer will be the person responsible for maintaining and storing day-to-day data and for preparing monthly reports.

Links with other management actions:
This activity will support in analysing the situation and help in planning other activities.

Location: Park headquarter office.

Schedule:

- By 2021, a database management system will be established at the Park.
- By 2022, templates will be designed and Ramsar Management Unit will be trained to maintain and store data.

Indicators of Achievement: The data management system is established and the Ramsar Management Unit are trained to maintain and store data systematically.

Budget:

NPR 250,000 for purchasing equipment necessary for establishing a database management system

NPR 500,000 for designing templates and organising training.

Total cost = NPR 750,000

Activity 3.4.1: Develop, validate and implement a funding strategy through consultation with local authorities, communities, private sector and public donors

Management plan objective: To establish an innovative and sustainable financing mechanism to ensure a reliable source of revenue to promote wetland conservation and local livelihoods.

Stakeholders and key actors:

- DNWC will lead the activity and ensure the funding source is secured by implementing a sustainable financing mechanism
- The funding for other activities of the site management plan will be supported by development and conservation partners such as DAI, USAID Paani Program, IUCN, WWF, NTB, UNDP and provincial and local governments.

Action description:

- A meeting will be held with development and conservation partners, NTB, in coordination with provincial and local government, to discuss the site management plan and adopt a sustainable financing mechanism
- Workshops for developing and implementing the funding strategy will be held
- Funding strategy will be prepared and implemented.

Links with other management actions:

The implementation of this plan and conservation and protection of the site after this plan period depends on the sustainable financing mechanism.

Location: The workshops and meeting will be conducted at central, provincial and local level.

Schedule: By 2021, a sustainable financing mechanism is developed and implemented.

Indicators of Achievement:
By 2021, a sustainable financing mechanism is developed and implemented.

Budget: NPR 200,000 for meeting and workshop.
Total cost = NPR 200,000

Outcome 4: Awareness and understanding of the importance of the Ramsar site at international, national and local level is enhanced.

Activity 4.1.1: Conduct wetlands-related educational programs in communities and schools around the Ramsar site, including a World Wetland Day Celebration at the site.

Management plan objective: To raise awareness through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth.

Stakeholders and key actors:

- DNPWC will be responsible for organising and coordinating with different concerned authorities such as ministries and departments, universities, conservation partners, NTB, travel agencies and other authorities meeting at central level, and RNP, with support from newly established RRMMC & BZMC at local level
- RNP with the support of RRMMC will be responsible for educating schools and communities.

Action description:

- The World Wetland Day at the site will be organised after conducting the wetlands-related educational programs in communities and schools, so that local people can volunteer on the World Wetland Day and make the day special
- A meeting with conservation partners, academics, local authorities to plan the action will be held
- Wetland related educational programs at school and communities will be organised
- Training on wetlands/environment conservation will be organised for school teachers, to encourage them to form an Environment Education and Conservation Group (EECG) at each school with an annual activity and monitoring plan.
- A committee will be formed to organise World Wetland day at national and site level
- World Wetland Day will be celebrated.

Links with other management actions:

- The training for school teachers will be conducted together with the activity 3.1.2 (train the RRMMC on Ramsar Convention)
- The ICT materials will be used as supporting materials.

Location:

- The wetland related educational programs will be conducted around the communities and school of Rara Lake Ramsar Site
- The World Wetland Day will be celebrated at the site.

Schedule:

- By 2023, the EECG group will be formed and will conduct wetland-related ongoing educational programs at communities and school
- On February 2, 2024 World Wetland Day will be held.

Indicators of Achievement:

- The local communities and students have increased their knowledge of wetland-related information which helps to conserve and protect the natural and cultural values of the Rara Lake
- School teachers are more capable of teaching students on wetland education and students are attracted to wetland conservation through the formation of EECG group and their annual plan
- The event promotes the Rara Lake Ramsar site to a wider audience and attracts increasing numbers of visitors.

Budget:

- NPR 50,000 for meeting with school and communities at site level
- NPR 500,000 for organising training sessions for school teachers (includes trainer's fee and expenses, and training materials and necessary expenses)
- NPR 700,000 for wetland-related educational programs at school and communities
- NPR 250,000 for meeting with concerned stakeholders at central and local levels to organise World Wetland Day
- NPR 2,000,000 to organise and celebrate World Wetland Day.

Total cost = NPR 3,500,000

Activity 4.1.2: Promote the Ramsar site through national platforms, media and other regional and international events, including the Ramsar COP, IUCN WCC, and CBD COP.

Management plan objective: To raise awareness through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth.

Stakeholders and key actors:

MoFE, DNPWC, RNP and IUCN will be responsible for presenting the information and updates on the site at a wider scale.

Action description:

- Explore and identify the most relevant opportunities to present the site management plan in upcoming national and international workshops, conferences and symposiums
- Prepare and submit an abstract for acceptance in the identified events. Some relevant events for submission of an abstract are Ramsar COP, IUCN World Conservation Congress and CBD COP
- Present the significance of Rara Lake Ramsar Site, including its ecological, social-economic and cultural values, conservation and management actions plans, to a wider group of audiences at various identified national and international platforms.

Links with other management actions

The findings of various assessments, including the updates of the site management plan of Rara Lake will be presented.

Location: The event venues can be national or international.

Schedule: At least two presentation will be made at international events during the plan period (2021 – 2025), and in various relevant national events as well.

Indicators of Achievement:

- Information on RLRS and its management are recognized in a wider scale
- Knowledge, experience and learnings exchanged on such events will be analysed, and good practices will be adopted for the better conservation and management of the site.

Budget:

- NPR 500,000 for presentation at two international events (includes registration fee, transport and accommodation of the presenters)
- NPR 50,000 for printing posters and other necessary materials for presentation.

Total cost = NPR 550,000

Activity 4.1.3: Establish a wetland information centre with displays about the ecology, history and cultural importance of the site and install Ramsar information boards throughout the site.

Management plan objective: To raise awareness through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth.

Stakeholders and key actors:

- DNPWC & RNP will be responsible for conducting this activity with technical support from IUCN
- The implementation of this action will be supported by MoFE, conservation partners, and local authorities.

Action description:

- Identify and prioritize the specific locations for installing signboards including Ramsar information
- Meet with stakeholders and different conservation partners to introduce the action; present the information, design and layout; validate the content, edit/revise.
- Install the information board with community involvement and assistance.

Links with other management actions:

- The findings and updates of the management plans, promotional video, and ICT products will be displayed in the information centre.
- This activity will be implemented in line with the Rara National Park Management Plan.

Location:

- A wetland information centre will be established at RNP headquarters
- Information boards will be installed at different entry points and trekking trails.

Schedule:

- By the end of 2021 the survey, identification and prioritization of the locations, meeting with the stakeholder to validate and revised the content, resource generation and other necessary office processes, will be complete
- By the end of 2022, site information will be well displayed via information boards and at the centre.

Indicators of Achievement:

- By 2022, at least 10-15 information boards, including the boundary of the Ramsar site, are installed at different entry points of the Ramsar site and trekking trails. English and Nepali language are used in the information, targeting the local, domestic and international visitors
- By 2022, a functional wetland information centre is established with a dedicated wetland officer
- Installation of information boards and the wetland information centre keeps communities and visitors well informed about the boundary and significance of RLRS.

Budget:

- NPR 100,000 for survey and meetings
- NPR 100,000 for developing content, editing and revising
- NPR 1,000,000 for production and installation of information boards
- NPR 2,000,000 for establishing a well-furnished wetland information centre.

Total cost = NPR 3,200,000

Activity 4.1.4: Develop and distribute ICT materials

Management plan objective: To raise awareness through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth.

Stakeholders and key actors:

- DNPWC & RNP will be responsible for conducting this activity with technical support from IUCN in designing the content
- The implementation of this action will be supported by MoFE, conservation partners, and local authorities.

Action description:

- The information and communication material such as posters, information sheet, flyers, etc. will be published
- The content of those materials will be taken from the results and findings of research and monitoring
- The material developed will be distributed at the site level, and digital copies will be shared with a wider audience through different communication media.

Links with other management actions:

- This activity will be supported by the information generated from output 1.1
- The developed ICT materials will be used as a tool for different awareness and wetland-related education programs.

Location: Materials distributed at site, and digital copies distributed to a wider audience nationally and internationally.

Schedule: By 2022, after getting the results and findings of output 1.1.

Indicators of Achievement: The site information has spread at wider audience.

Budget:

- NPR 200,000 for developing content and design
- NPR 1000,000 for publication and distribution.

Total cost = NPR 1,200,000

Activity 4.1.5: Develop and implement Rara Lake Ramsar Site Communication, Education and Public Awareness (CEPA) Plan.

Management plan objective: To raise awareness through the development and implementation of a comprehensive Ramsar CEPA strategy involving local stakeholders, including women and youth.

Stakeholders and key actors:

- DNPWC & RNP will be responsible for conducting this activity with technical support from IUCN
- The implementation of this action will be supported by MoFE, conservation partners, and local authorities.

Action description: Rara Lake Ramsar Site CEPA plan will be prepared in consultation with different stakeholders.

Links with other management actions:

- This activity will be supported by the information generated from the output 1.1.
- The developed ICT materials will be used as a tool for different awareness and wetland-related education programs.

Location: Rara Lake Ramsar Site.

Schedule: By 2022, CEPA plan is prepared.

Indicators of Achievement: The CEPA plan is prepared and is being implemented.

Budget: NPR 1,500,000 for developing and implementing CEPA plan.

Total cost = NPR 1,500,000

5.3 IMPLEMENTATION MECHANISM

5.3.1 Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee

Dedicated, site-specific, cross-sectoral human resources are required to improve and maintain the ecological integrity of the site. The plan recommends the development of a Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee, responsible for overseeing the governance of the Ramsar site. The management committee proposal was developed based on consultations with government actors, community leaders, lake managers, local government bodies and conservation partners during the plan development process. The committee will help ensure that the decision-making processes and future development of Rara Lake Ramsar Site maintains its ecological values. To achieve this, the capacity of the existing park and protection unit staff needs to be enhanced with a focus on Ramsar site management.

The Committee will be commissioned by the Ramsar Administrative Authority, DNPWC. This committee will be formed under the leadership of the Chief Conservation Officer of Rara National Park, with representation from the Buffer Zone Management Committee, user groups, line agencies, civil society organizations and private and public sector institutions. The committee will meet every six months at the park office, to plan and monitor programs related to the sustainable use and conservation of Rara Lake, and the implementation of the Management Plan. The Lake Management Committee is also expected to provide guidance and suggestions to stakeholders.

The committee will comprise 17 members with representation from all stakeholders.

Members in the Committee

- Chief Conservation Officer – Chairperson
- Assistant Conservation Officer/ Ranger – Member Secretary

Representative Members

- Local Government – 4 (one ward chair from each Palika, Chhayanath Rara Municipality, Khatyad and Soru Rural Municipality of Mugu and Kanakasundari Rural Municipality of Jumla District)
- Nepal Army – 1
- BZUC – 2 (male and female) (BZUC chairs selected by BZMC)
- Community Forest Users' Group – 1
- Mothers' Group – 1
- Hotels – 1
- Home stay – 1
- Private sector/ tourism – 1
- Civil Society – 2 (indigenous group and female representative)
- CBAPU – 1.

Since the Rara National Park and its Buffer Zone Management Plan (2076/77 – 2079/80) (2019-2024) implemented by the RNP and BZMC has already been developed, the Rara Lake Ramsar Site Management Plan should be used in conjunction with the National Park Management Plan.

The newly established Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee will be trained by wetland experts. The committee will be responsible for decision-making and coordinating specific aspects of implementation within the themes of the Rara Lake Ramsar Site Management Plan, including:

- Communicating the importance of the Ramsar Site to the community and visitors
- Liaising with the Ramsar Secretariat
- Supporting the proposal of the expanded Ramsar Site around the watershed
- Maintaining equipment used for assessments and data collection
- Updating a digital library and database management system
- Coordinating the implementation of the action plan with National Park authority, Buffer Zone Management Committee, Army protection units, Task Force and other required parties, including
- Determining baseline targets
- Data collection, data input into the digital library and database management system, analysis and communication of findings and proposed management responses when required
- Water quality monitoring
- Inventory of flora and fauna
- Detailed research on aquatic species
- Coordinated monitoring and evaluation of implementation progress, including periodic reporting on action/work plan progress.

5.3.2 Ramsar Site Management Unit

The park authority will develop a Ramsar site management unit from amongst its staff in the park, with one senior technical staff dedicated to wetland management, and responsible for coordinating, planning, monitoring, implementing and reporting on the Site Management Plan. The Ramsar Site Management Unit includes the Task force. It will also provide guidelines and suggestions on the sustainable management of the lake, and work to address problems and challenges encountered. The existing planning section will work as Ramsar Site Management Unit till another decision.

5.3.3 Chayanath Rara Municipality

The rural municipality will secure some funding for the implementation of Rara Lake Ramsar Site Management Plan. The municipality will include planned activities related to infrastructure development and diversifying community livelihoods in its annual work plan in coordination with Rara Lake Ramsar Coordination Committee.

5.3.4 Karnali Province Government

The provincial government will secure funding to promote the tourism industry at the site.

5.3.5 Community Institutions

There are very few groups involved in conservation and management of wetland resources. However, there is a buffer zone management committee/user committee and users group, community forest users' group, a water users group, and a horse riding management committee who are working for the conservation and management of water resources. These groups can be engaged in the activities of the management plan.

The table below presents the roles and responsibilities of the key institutions for the implementation of the plan.

Table 5 Roles and Responsibilities for Management Plan Implementation

Institution	Role and responsibility
Ministry of Forests and Environment	Policy support; creating an enabling environment for Rara Lake management and wise use; financing.
Ministry of Industry, Tourism, Forest and Environment, Karnali Province	Policy support for program implementation, coordination, monitoring and financing.
Department of National Parks and wildlife Conservation	Supporting program implementation; coordination and monitoring as a Ramsar focal point; creating an enabling environment for financing.
Rara National Park Office	Conservation program planning; implementation, coordination, joint monitoring, documentation and reporting.
Buffer zone Management Committee, User Committees and Users Groups	Implementation
Division Forest Office	Coordination; program partnership; planning.
Rural Municipalities	Policy support; program partnership; coordination; resource leverage; planning.
Nepal Tourism Board	Coordination; program partnership; planning.
Conservation and Development Partners	Technical and financial support; technology transfer; human resource development; research and development; coordination and planning.
Private and Tourism Sectors	Enterprise development; investment.

5.4 MONITORING AND EVALUATION

5.4.1 Monitoring

Throughout the site management plan's five-year period, the action plan will be adjusted to ensure that it is always relevant, appropriate and based on implementation learnings. The Rara Lake Ramsar Site Multi-stakeholder Coordination Committee will be guided and trained to use principles of the Adaptive Management framework – process that acknowledges the uncertainties of a dynamic ecosystem, with influences such as climate change and tourism, and therefore progressively improves management. This approach will allow for systematic improvements to be made, based on monitoring and learning.

Annual monitoring of planned activities will be conducted by DNPWC, together with the Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee. Findings from this monitoring will be documented and problems identified during implementation will be solved through discussion with those involved. The DNPWC will play a lead role in reporting, and the final report will be submitted to the Environment and Biodiversity Division, the Secretariat of National Wetland Committee, the Ministry of Forests and Environment annually. The indicators listed in the logical framework will be used throughout the monitoring process. An impact assessment will be conducted in the 4th year based on the log frame.

5.4.2 Evaluation

An independent contractor will be hired to conduct an interim evaluation in the 3rd year of the plan, and at the end of the five years. The evaluation will review the relevance, effectiveness, efficiency, impact and sustainability of the management activities. The DNPWC will consider the findings and recommendations of the evaluation and propose any adjustments to the action plan for the remaining

duration of the project. The National Park authorities will prepare the terms of reference for hiring the evaluator for the interim and final evaluations in consultation with Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee and other key stakeholders. The evaluations will use the indicators identified in the log frame. The Rara Lake Ramsar Site Multi-Stakeholder Coordination Committee will develop a management response to the findings and recommendations of the interim evaluation for adaptive management and implementation of the plan and will present them to DNPWC for approval and endorsement.

Participatory approaches will be adopted for monitoring and evaluation, as it is important to ensure representation of diverse perspectives in the review as well as to build local capacity for monitoring and evaluation among stakeholders.

5.5 SUSTAINABLE FINANCING

Funding will be managed through the DNPWC annual budget from central government. The province and local governments will also work to secure financial resources for implementation. Different stakeholders including development/conservation partners, the private sector, provincial and local government will work together for technical and financial support, to make the management plan sustainable. Planning workshops will be conducted for stakeholders to orient and inform them about the management plan, in order to get further financial and technical support. The planning workshop will be conducted at the start of each new fiscal year so that they are able to integrate the activities related to wetland management in their regular annual plans. DNPWC and RNP, in collaboration with conservation partners will develop proposals for international funding. DNPWC will collaborate with universities to conduct further research at the site level.

The following key stakeholders could be the potential source of financial and technical support for the implementation of Rara Lake Ramsar Site Management Plan:

- Rara National Park
- Division Forest Office
- Federal Government of Nepal
- Karnali Province Government
- Chayanath Rara Municipality
- FNCCI/ District chapter
- Buffer Zone Management Committee
- Funding from Conservation Partners and Donor Agencies
- Nepal Tourism Board
- Local NGOs, Clubs, Schools
- Private Sectors
- Nepal Army

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ANNEX 1: ASSESSMENT OF ECOLOGICAL CHARACTER

The assessment[11] of the overall current state and trend of Ramsar Site ecological character is based on Key Informants Interview (KII), Focus Group Discussion (FGD), direct observation and literature, which showed that there are inadequate data.

PART A: RAMSAR CRITERIA – reflects the criteria used for site designation		Assessment					Trend			
Values	Justification of assessment	G	LC	HC	C	DD	I	S	D	DD
Largest lake in high altitude	see criteria 1 above									
Supports number of rare and vulnerable fauna and flora species	Criteria 2									
Natural habitats for endemic species of plants and one frog species	Criteria 3									
Supports winter migratory birds	Criteria 4.									
Supports endemic fish species	Criteria 7									
Important source of food for endemic fishes and migratory waterfowls	Criteria 8									

PART B – OTHER IMPORTANT FEATURES – from the Ecological Character Description or other knowledge of site managers.										
Hydrological values										
Plant Diversity										
Social and Cultural Values										
Assessment of the overall current state and trend of Ramsar Site ecological character:	Key Informant Survey, Focus Group Discussion, Field Visit, Literature									

11. The current state of values is assessed against five ratings: Good (G), Low Concern (LC), High Concern (HC), Critical (C) and Data Deficient (DD). The baseline for the assessment should be the condition at the time of designation, with reference to the best-recorded historical conservation state. Trend is assessed in relation to whether the condition of a value is Improving (I), Stable (S), Deteriorating (D) or Data Deficient (DD), and is intended to be a snapshot of recent developments over the last three years.

ANNEX 2: SWOT ANALYSIS

Strengths	Weaknesses
• Largest lake at high altitude • Supports rare and vulnerable fauna and flora species • Natural habitats for endemic species of plants and one frog species • Supports winter migratory birds • Supports endemic fish species • Important sources of food for endemic fishes and migratory waterfowl • Legal Status • Law Enforcement • Protection System • Local Communities' support through BZMC.	• Unclear physical boundary for Ramsar site • Conflict of interest among stakeholders • No site-specific management plan • Limited research • Poor visitors' facilities • Inadequate Ramsar site-specific training to National Park and protection unit staff.

OPPORTUNITIES	THREATS
• Policy and legislation support for the Ramsar site conservation • Coordination and support of local users/community • Involvement of users in the management process • Balancing of ecosystem services • Benefit sharing from the use of Ramsar site • Tourism diversification • Mechanism for effective communication • Promotion of cultural village homestays for enhancement of livelihood • Hub for highland endemic biodiversity • Enhancement of cultural connection for Ramsar site protection and conservation.	• Inadequate of coordination among stakeholders • Increasing demand for infrastructure development such as hotels, resorts • Loss of environmental values and services • Tourism and recreation infrastructure • Open grazing and potential disease outbreak • Recreational and tourism activities • Drought Conditions • Pathogens • Garbage and solid waste • Temperature extremes • Loss of cultural links, and traditional knowledge • Loss of keystone species • Natural deterioration of important cultural site values • Destruction of cultural heritage buildings, sites • Park infrastructure • Mining and quarrying • Developmental activities • Utility and service lines • Flight paths • Hunting and poaching of animals as a result of human-wildlife conflict • Unsustainable harvesting of resources • Habitat clearing • Fire; fire suppression mechanisms • Dams and hydrological modifications • Invasive alien plants • Avalanches/landslides • Erosion and siltation • Habitat shifting and alteration

ANNEX 3: THREAT ASSESSMENT

Findings from Data Sheet 3: Ramsar Site Threats (Medium and Low Risk)

NOTE: the below threats are ranked after participatory consultation and consensus. Ranking is based on people's perception, available literature and expert observation. The threats to the Rara Lake Ramsar Site are ranked below as per the level of significance.

Medium Threats - which have some negative impacts

1. Loss of keystone species - A decrease in the number of fish (Shrestha 2017) and other wildlife is observed. However, detailed study has not yet been carried out. The lake hosts 3 endemic fish species, namely *Schizothorax rarensis, S. nepalensis, Schizothoraichthys macrophthalmus* (Terashima, 1984; Shrestha 2017). In the past, the locals used to catch approximately 10 kg of fish per day from the confluence area of the lake and the feeding streams. The red panda preferred, areas without grazing activity. It is noted that red panda occurrence was affected by livestock grazing in Rara National Park (RNP) (Thapa, et al., 2020; Sharma, et al., 2015).
2. Natural deterioration of important cultural site values - Diminishing value due to the lack of timely maintenance, limited resources, and lack of promotion (including that of the local Mugali culture).
3. Destruction of cultural heritage buildings, sites - Communities are focused on income generation activities; active participation of the community in maintaining and renovating cultural sites is seen to have decreased compared to in the past. However, park and BZ have some projects such as to renovate/maintain cultural sites and to organise cultural programmes for promotion and conservation of cultural heritage. Projects that are to be carried out in RNP to diversity tourism products and activities include: 'protect, upgrade and promote religious temples and caves located in and around Rara Lake', with an annual budget allowance for the 'Maintenance of temples and other religious sites' (RNP 2019 pg 116).

Low Threats - which are present but not seriously impacting values

1. Park infrastructure - Water pollution from park infrastructure (see figure 4), such as sewage contamination, exists despite its proper planning and management.
2. Mining and quarrying[12] The increase in infrastructure and development works that demand the use of stone (USAID 2019) may have a direct impact on the buffer zone and Park (RNP 2019). The major resources used for the construction of roads, building and other purposes are sand, gravel and stone, which play a vital role in the socio-economic and infrastructure development of the Park and communities. The area with most potential for these resources are ward no 3, Nigale, and ward no 6, Balai of Chhayanath Rara Municipality. However, the excavation activities are prohibited in the areas where they could affect habitat, breeding and mobility of the animals. In other areas, buffer zone communities are allowed to undertake regulated excavation (RNP 2019)
3. Road development - Increasing vehicle flow, and the unmanaged driving route up to nearby Milichaur, are causing threats and disturbance to wildlife and grassland habitat. In recent years before there were road facilities, the Army post at Millichaur recorded up to 25 -30 four-wheelers and 25-30 motorbikes per day during the tourist season (September - November).
4. are currently available. However, extension of electricity power lines from Gamgadhi to Rara is in process and may have an impact in the near future.
5. Flight paths - There are scheduled flights from Nepalgunj airport that cross the Ramsar site, and

12. Data about the extraction and mining location will be provided after second field visit, if available.

occasional rescue helicopters cause noise pollution that may impact wildlife.

6. Hunting, killing and collecting terrestrial animals, including that resulting from human-wildlife conflict (HWC) - The main cause for HWC is crop depredation by wild animals and occasional wildlife attacks. RNP (2019) is adopting a strategy to promote human-wildlife coexistence through a buffer zone (BZ)) program and a relief scheme that is regulated under a quick response mechanism, to ensure timely treatment and financial assistance. RNP also acknowledges that long-term solutions are still required to reduce HWC.
7. Gathering terrestrial plants or plant products (non-timber) - Detailed study on non-timber forest products (NTFP) has not yet been conducted. However, illegal harvesting of NTFPs, including Guchhi Chyau (mushroom) and other flora, has been observed to be increasing.
8. Logging and wood harvesting - Infrastructures within the site, such as hotels, parks and the Army camp, are using the forest resources. The use of the forest resources is regulated by the Park; however, it might have some impact.
9. Fishing, killing and harvesting aquatic resources - Illegal fishing activities have been largely controlled due to effective and regular patrolling from Park authorities. However, some still occur.
10. Activities of site managers - Occasionally management activities such as fire-line construction, maintaining trails, grassland management, and construction of visitor facilities, viewing towers, resting places and vehicle roads, involves tree cutting for site clearance. This may alter the ecosystem function.
11. Deliberate vandalism, destructive activities or threats to the protected area, staff and visitors – Infrequently, confrontation between the Park and people regarding resource use and HWC occurs (for instance, crop depredation by wildlife in nearby villages is becoming a problem for maintaining harmonious relationships between wildlife and people).
12. Habitat clearing - Deforestation has been reported frequently from nearby settlements, which is triggered by stone mining; most villagers are dependent on it.
13. Fire and fire suppression (including arson) - Occasional forest fires occur but are infrequent and occur mostly in the hot summer season. However, there is no systematic data collection regarding the fire incidents. The catchment of Rara Lake is mostly covered by pine forest, which is a fire prone species.
14. Dams, hydrological modification and water management/use - Climate change induced hazards, like landslides (MOFE 2019), sedimentation, and shifts in lake temperature, might be impacting fish and other macroinvertebrates. No study has been carried out, however, there is recent evidence of fish death at noticeable quantities, with unidentified reason.
15. Invasive non-native/alien plants - No new species have been reported at this point.
16. Sewage and wastewater from Ramsar Site facilities - There are only two hotels inside the Site area and they are using septic tanks. However, proper treatment facilities for sewage and wastewater do not exist. This could pose a major challenge with increasing number of visitors.
17. Earthquakes - Water seepage or lake outburst as a result of an earthquake is a possibility, if the epicentre is in close proximity to the lake. Locals believe the villages nearby the lake are vulnerable to future unpredictable hazards. However, there is not any scientific evidence of this risk.
18. Avalanches/Landslides - At present avalanches/landslides are not anticipated. However, there is a possibility of climate-change and human-induced landslides in the catchment area of the lake and its surroundings (MOFE 2019).

19. Erosion and siltation deposition - Some erosion and siltation was observed[13] Storms and flooding - The Ramsar Site is less affected by storms. Flood occurs downstream of the Rara Khatyad watershed.

20. Storms and flooding - The Ramsar Site is less affected by storms. Flood occurs downstream of the Rara Khatyad watershed.

Picture 13 : Morning view of Rara Lake Photo Credit: USAID Paani Program

13. There are no bathymetric maps across different time periods that could inform the rate of siltation and lake succession. Thus, detailed study needs to be carried out.

ANNEX 4: WATER QUALITY PARAMETERS MEASURED DURING THE FIELD VISIT

S. No.	Temp (0C)	pH (-)	ORP (mV)	DO (ppm)	EC (µS/cm)	TDS (mg/L)	Sal PSU	Turb FNU	GPS Coordinates Latitude (N)	Longitude (E)	Sampling sites
1	14.52	7.89	95.4	5.62	222	111	0.11	0.3	29°31'52.34"	82° 4'7.29"	In between Hotel Daphe and bridge
2	14.53	7.88	95.8	5.63	222	111	0.11	0.3	29°32'14.4"	82° 4'34.41"	In front of Daphe hotel
3	14.31	7.92	76.4	6.15	209	104	0.1	3.5	29°32'20.28"	82° 4'48.39"	Near Machan (Boat)
4	14.46	7.37	115.9	6.93	218	109	0.1	0.4	29°32'18.75"	82° 4'49.38"	Data collected in the lake transect
5	14.37	7.5	106.3	6.04	214	107	0.11	16.7	29°32'6.54"	82° 4'56.27"	,,
6	14.57	7.4	113.3	5.87	220	110	0.11	0.3	29°32'2.90"	82° 4'59.21"	,,
7	14.54	7.54	108.5	5.78	220	110	0.11	0.3	29°31'56.08"	82° 5'2.51"	,,
8	14.55	7.57	107.5	6.78	221	110	0.11	0.3	29°31'49.61"	82° 5'4.35"	,,
9	14.53	7.74	100.7	5.71	221	110	0.11	0.3	29°31'41.1"	82° 5'9.98"	,,
10	14.50	7.66	102.4	5.65	221	111	0.11	0.3	29°31'30.16"	82° 5'11.97"	,,
11	14.48	7.73	100.8	5.60	221	111	0.11	0.3	29°31'20.51"	82° 5'9.03"	,,
12	16.18	7.82	47.8	6.83	220	110	01	1.9	29°31'13.06"	82° 5'8.00"	,,
13	16.23	7.92	48.9	6.82	220	110	0.1	0.6	29°32'37.5"	82°5'53.8"	On the way to Thakur Nath temple
14	17.31	7.71	79.9	5.73	218	109	0.1	1.1	29°32'36.5"	82°6'12.4"	,,
15	15.93	7.65	67.3	5.80	219	109	0.1	10.1	29°31'57.1"	82° 7'22.3"	,,
16	14.93	7.52	79.5	6.51	280	140	0.13	1.0	29°31'49.1"	82° 6'47.3"	Near wooden bridge (Inlet 2)
17	14.54	7.2	54.2	6.40	201	101	0.1	3.1	29°31'01.3"	82°05'24.0"	Small Milli (Inlet 1) middle
18	14.36	7.33	75.3	6.52	210	105	0.1	17.1	29°30'43.7"	82°05'19.1"	Small Milli (Inlet 1) upstream
19	14.12	7.28	82.4	6.64	224	112	0.11	1.1	29°31'45.8"	82°33'6.3"	Mazghat (Outlet) down stream
20	14.87	7.7	72.8	6.77	228	118	0.1	0.3	29°31'47.8"	82°04'02.3"	Nijjar pool (main outlet) upstream
21	14.65	7.27	22.6	6.08	151	302	0.14	6.1	29°32'25.3"	82°04'54.7"	In front of army camp inlet

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