# Initial Environmental Examination

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# Nepal: Urban Resilience and Livability Improvement Project – Improvement to Road and Drains in Pokhara Metropolitan City

Prepared by the Department of Urban Development and Building Construction, Government of Nepal for the Asian Development Bank.

## CURRENCY EQUIVALENTS

(as of 20 May 2023)

| | | |
|---|---|---|
| Currency unit | - | Nepalese rupee (NPR) |
| NPR 1.00 | = | $ 0.01 |
| $ 1.00 | = | NPR 131.91 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | - | Asian Development Bank |
| BES | - | Brief Environment Study |
| BOQ | - | Bill of Quantities |
| CBD | - | Convention on Biodiversity |
| CBS | - | Central Bureau of Statistics |
| CHS | - | Community Health and Safety |
| CRO | - | Complaint Receiving Officer |
| DSC | - | Design Supervision Consultant |
| DOTM | - | Department of Transport Management |
| ECC | - | Environmental Clearance Certificate |
| EHSO | - | Environmental Health and Safety Officer |
| EIA | - | Environmental Impact Assessment |
| EMP | - | Environmental Management Plan |
| EPA | - | Environment Protection Act |
| EPR | - | Environment Protection Rule |
| GoN | - | Government of Nepal |
| GRM | - | Grievance Redress Mechanism |
| IBAT | - | Integrated Biodiversity Assessment Tool |
| IEE | - | Initial Environmental Examination |
| ISCPC | | Institutional Strengthening and Community Participation Consultant |
| IUCN | - | International Union for Conservation of Nature |
| IUDP | - | Integrated Urban Development Plans |
| LPG | - | Liquefied Petroleum Gas |
| MoFE | - | Ministry of Forests and Environment |
| MOM | - | Management, Operation and Maintenance |
| MoUD | - | Ministry of Urban Development |
| NWP | - | National Water Plan |
| OHS | - | Occupational Health and Safety |
| PCR | - | Physical Coordination Unit |
| PIU | - | Project Implementation Unit |
| PMCDC | - | Project Management and Capacity Development Consultant |
| PCU | - | Project Management Unit |
| PPE | - | Personal Protective Equipment |
| REA | - | Rapid Environmental Assessment |
| RM | - | Rural Municipality |
| RoW | - | Right of Way |
| RPs | - | Resettlement Plans |
| RUDP | - | Regional Urban Development Project |
| SDC | - | Supervision and Design Consultants |
| SECs | - | Small Ethnic Communities |

SPS - Safeguard Policy Statement, 2009
WHO - World Health Organization

## WEIGHTS AND MEASURES

| | | |
|---|---|---|
| % | – | Percentage |
| °C | – | degree Celsius |
| $\mu g/m^3$ | – | Microgram per cubic meter |
| dBA | – | decibels audible |
| ha | – | Hectare |
| km | – | Kilometer |
| $m^3$ | – | cubic meter |
| mm | – | Millimeter |

## NOTE

In this report, "$" refers to United States dollars.

**CONTENTS**

**TABLES**



**FIGURES**

**APPENDICES**

## EXECUTIVE SUMMARY

The Urban Resilience and Livability Improvement Project (URLIP) will support to improve municipal infrastructures and governance of the selected project municipalities, thereby contributing to achieve inclusive economic growth and improved liveability. This will be achieved through the following three outputs: (i) Output 1: Municipal infrastructure for resilience developed; (ii) Output 2: Tourism assets revitalized, and management improved; and (iii) Output 3: Capacity of municipalities, provincial governments, and Department of Urban Development and Building Construction (DUDBC) strengthened. The DUDBC under the Ministry of Urban Development (MOUD) is the executing agency and is responsible for technical and project management matters including engineering, safeguards, and social aspects. The project will support seven municipalities (Pokhara, Janakpur, Devdaha, Lumbini Sanskirtik, Sainamaina. Siddharthanagar, and Tilottama). The Implementing Agencies are each of the project covered municipalities.

**Subproject scope.** Under URLIP, two road projects with roadside drainages have been proposed in Pokhara Metropolitan City: (i) International airport to lakeside (Fewa) fast track road 8.8km.), and the other (ii) Damdame-Kudbi-Sidane-Bhanjyang road with a total road length of 13.km. The total road length is 21.8 km. International Airport to Lakeside Fast-Track Road (called Airport-Lake Road hereafter) and Damdame – Kudbi – Sidane - Bhanjyang Road (called Panchase Road hereafter) are located within the PMC. The Airport – Lake Road is an existing 8.8 km long bituminous road, which will be improved and provided with road safety and other additional road components. Panchase Road has a total length of 13 km, it will upgrade to a two-lane road within the available road right of way.

**Categorization.** The proposed Pokhara Subproject is classified as Environmental Category “B” as per ADB’s Safeguards Policy Statement (SPS), 2009 and accordingly this Initial Environmental Examination (IEE) is carried out. As per Government of Nepal (GoN) regulations, the project components require conducting a Brief Environmental Study (BES). The implementing agency shall prepare and submit BES report to the Ministry of Urban Development, the line agency, for review and issue of Environmental Clearance.

**Description of the Environment.** The project area is located in Pokhara Metropolitan City in Kaski District, Province No 4. It is located in the Mid hills region of Nepal, and its altitude varies from 827 meters above mean sea level (msl) in the south to 1,740 m in the north. Pokhara valley is formed of Seti gandaki River which is the tributary to the Trishuli River. Gandaki River originates in Annapurna massif of north-central Himalayas of Nepal. Setigandaki River flows through Pokhara valley. The PMC is also noted for high geological relief, river escarpments, karst topography and glacial lakes (e.g., Phewa and Begnas lakes). Despite the high relief within short geological formation, the PMC is built on broad flat plain. Climatically, the PMC falls into a humid subtropical climate regime. Temperatures range from 25°C to 35°C in the summer, and from -2°C to 15°C in the winter. The variation in the precipitation between the driest and wettest months is 870 mm in a year. The PMC is rich in water resources with several rivers such as Seti, Bijayapur, Kahu, Kali, Yamdi, Fusre, Buloudi and Herpan. The PMC is dotted with lakes (i.e.: Phewa, Begnas, Rupa, Maidi, Khaste and Gunde and Niureni, Dipang and Kamal referred often as Pokhari or ponds.

Pokhara is home to the largest Ramsar Site in Nepal, the Lake Cluster of Pokhara that includes nine lakes in the area viz., Phewa, Begnas, Rupa, Dipang, Maidi, Khaste, Neurani, Kamalpokhari, and Gunde. Both the road components under the project are within one km of the Phewa Lake. The Phewa Lake is being impacted by the flow of sediments from the earther roads in the hilly region, including the existing Panchase Road section. Improving the Panchase Road would

reduce the silt laden runoff and will be beneficial to the wetlands ecosystem in Pokhara. Pokhara is a prominent tourist destination of international repute because of its proximity to himlayan peaks of Machhapuchre (6993 m high) and Annapoorna Peak (8091m high), Ramsar Lakes and forest areas. The general tourist season is during March to May and September to November every year. Recently, in January 2023, a new International Airport was inaugurated at Pokhara and is operational for both domestic and international flights.

The Airport to Lakeside Link Road is built on a flat terrain. The road currently has a single-lane operational paved carriageway and does not segregate slow-moving vehicles and pedestrians. The road section requires capacity augmentation, pavement reconstruction and improve drainage network to maintain acceptable levels of service. The Panchase Road is built on a mountainous terrain and passes through agricultural fields in the valleys and forests along the hillside. This road experiences a lot of tourist traffic and a number of homestays are located along the route to the Banjyang. A reconnaissance tree survey carried out along the road sections reveal that there is no major impact on trees along the two road stretches. There are a few sacred Peepal (*Ficus religiosa*) trees, along the International Airport to Lakeside Road, which needs to be preserved. Alternative road / drain alignments shall be designed locally to save the Peepal (*Ficus religiosa*) trees. Panchase Road improvement works will be taken up within the 7-8m wide already available.

**Assessment of Potential Environmental Impacts and Mitigation Measures.** Potential negative impacts were identified, especially those concerning pre-construction, construction and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible. Emphasis was on avoiding cutting of trees especially a few sacred Peepal (*Ficus Religiosa*) Tree Species that are present along the road stretch from the Airport to Lakeside. It is proposed to alter road / drain alignments locally to avoid cutting the sacred Peepal trees. The Panchase Road passes along scenic mountain villages with agricultural lands in the valleys and forests along the hill side. The 13 km Panchase Road stretch has a clear width of 7-8m along the entire road stretch. Since the proposed Panchase Road improvement involves road construction and asphalting the existing road alignment, no filling or cutting sections that can change the horizontal or vertical hill profiles will be encountered during implementation. Hence, there are no impacts on the vegetation or the forest cover arising from the implementation of the Subproject. Additionally, the road designs are combined with improvements in drainage systems that are achieved by incorporating lateral drains and cross drainage structures to ensure safe conveyance of storm water during rainfall events.

However, at certain sections of the 13 kms Panchase Road, the area may be prone to landslides. These locations shall be identified during the detailed design and appropriate landslide prevention structures would be incorporated into the design. The measures taken up ensures that the environmental impacts arising due to the project design or location are not significant.The Panchase road crosses 6 local streams with existing culverts and joins to Harpan Khola, that feeds to Phewa Lake. The impacts on the water quality of these streams would occur when the any contamination from construction activities is discharged into the streams. Such impacts tend to happen when there is leakage of materials and chemicals from storage facilities, construction waste is not managed scientifically and sanitation facilities are not operated effectively and in an environmental-friendly manner. The Airport – Lakeside (Phewa Lake) Link Road crosses the Seti River on an existing bridge. Phewa Lake is not impacted from the construction activities as the Road culminates at the lake and the construction activities would not lead to any impact on the lake. No other Ramsar Lake Cluster site would be impacted from the Airport – Lakeside Link Road construction.

The roads and roadside drainage will involve straightforward construction and is unlikely to cause significant adverse impact. Usual construction-related impacts such as noise, dust generation, silt generation, soil and water contamination from chemicals spills and leaks, construction waste generation, and occupational and community health and safety risks including the spread of COVID-19, among others, will be localized, temporary and avoidable with the implementation of mitigation measures in the Environmental Management Plan (EMP). Other potential impacts, such as tree cutting, will be avoided/mitigated through the implementation of the EMP. All road works will be confined on existing road and side drains alignments, and within existing rights-of-way (ROWs). The Panchase Road construction would impact tourists' travel to the reputed tourist spots in the project area. The impact can be mitigated by taking up improvements to tourism-related infrastructure in a sequential manner so that certain activities are always available for the tourists to indulge in. The Airport – Lakeside Link Road does not impact tourists negatively as the proposed link road will be supplementing the existing road that connects the Airport to the Town. In fact, the proposed link road is expected to play a beneficial role when the upgradation of the existing road is taken up by the PMC.

**Environmental Management Plan.** An Environmental Management Plan (EMP) has been developed and included as part of this IEE, which outlines the following: (i) mitigation measures for environmental impacts during implementation; and (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting. While no impact on trees are envisaged from the implementation of the two subprojects, in the event the final designs reveal impacts on trees, compensatory afforestation in the ratio of 1:10 (i.e., 10 trees to be planted for one tree cut) has been incorporated in the EMP.

Also, in accordance with this EMP, the Contractor will be required to prepare a site-specific environmental management plan (SEMP). Contractor will submit its SEMP for approval to the Project Implementation Unit (PIU). The EMP and SEMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a pro-active, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (v) ensure that safety recommendations are complied with. Copies of the EMP and SEMP shall be kept on-site during the construction phase. The Contractor will be responsible for the organization, direction, and execution of environmental management related activities during construction of the proposed subproject. The Contractor will also undertake all activities in accordance with the relevant environmental requirements, including consent documentation and other regulatory and/or statutory and contractual requirements.

The Environmental Monitoring Program suggested in the EMP would need to be carried out by the Contractor during the construction period. The Environmental Monitoring Program would involve monitoring the air quality, surface water quality, groundwater quality, noise levels etc. The results of the Environmental Monitoring Program should be included in the periodic reports submitted by the Contractor to the PMCDC / PIU / PCU, as the case may be.

**Implementation Arrangement**. The Ministry of Urban Development acting through Department of Urban Development and Building Construction (DUDBC) will be the Executing Agency (EA) and the Pokhara Metropolitan City will be Implementing Agency (IA) of the Pokhara Subproject. The Project Coordination Unit (PCU) under the DUDBC will be responsible for the overall implementation of the project and ensure compliance to ADB environmental safeguards requirement. The PCU will work closely with the Project Implementation Unit (PIU) at the Pokhara

Metropolitan City level. The Project Management and Capacity Development Consultants (PMCDC) and Design and Supervision Consultant (DSC) will each include an Environmental Safeguard Specialist who will support in the efficient overall implementation of environmental safeguards of the project. The PMCDC will submit quarterly monitoring reports to PCU, and the PCU will send semi-annual monitoring reports to ADB. ADB will post the semi-annual environmental monitoring reports on its website as part of its disclosure requirements.

The Contractor will be required to (i) obtain all statutory clearances (other than Environmental Clearance) prior to commencement of civil works; (ii) establish an operational system for managing environmental impacts; (iii) prepare a SEMP based on the EMP of this IEE, and submit to PIU for approval; (iv) carry out all of the monitoring and mitigation measures set forth in the approved SEMP; and (v) implement any corrective or preventative actions set out in safeguards monitoring reports that the PCU will prepare from time to time to monitor implementation of this IEE, EMP, and SEMP. The Contractor shall allocate adequate budget and resources for compliance with these EMP measures, requirements and actions.

**Consultation, Information Disclosure and Grievance Redress Mechanism.** The Pokhara Subproject has undertaken meaningful consultations during the project preparatory stage. Public consultations were conducted with the public representatives, elected members at the ward level and the residents during April 2023. As part of the process, information on the subproject components were provided to the participants at these consultations. Their views were incorporated into the IEE and in the planning and development of the subproject. This draft IEE will be made available to the public through the ADB, DUDBC / PCU websites. The consultation process will be continued during project implementation, to ensure that stakeholders are fully engaged in the project and could participate in its development and implementation. A project-specific Grievance Redress Mechanism (GRM), described in this draft IEE, will be established to receive, record, and redress public complaints in a time bound and effective manner.

**Monitoring and Reporting**. PCU and PIU, with support from DSC and PMCDC, will be responsible for monitoring the project implementation and compliance with EMP requirements. The Contractor will submit monthly reports to the PIU with jurisdiction over the subproject. The PIU will submit quarterly environmental monitoring reports to PCU. The PCU shall consolidate quarterly reports from the PIUs and prepare semi-annual environmental monitoring report (SEMRs) which shall be submitted to ADB. PCU and ADB will post the cleared SEMRs on the project website and ADB website, respectively. ADB will monitor the project on an ongoing basis until a project completion report is issued.

**Conclusion and Recommendations**. The proposed subproject is unlikely to cause any significant adverse impacts to environment and people. Potential negative environmental impacts are mainly associated with construction and can be mitigated through proper engineering practice, the mitigation measures included in the EMP. The citizens of Pokhara will be the major beneficiaries of this subproject that will result in key environmental benefits such as, but not limited to, reduction in flooding areas, improved road and pedestrian safety to users resulting from improved road infrastructure and drainage facilities. Additional benefits from the project include the reduction in sediment load into the Lake Cluster of Pokhara, the largest Ramsar Site in Nepal, thereby contributing positively to an important wetlands ecosystem. This IEE is based on the conceptual / feasibility designs of the subproject, and shall be updated by the PCU, with support from PMCDC, based on final detailed design and submitted to ADB for review, clearance, and disclosure. No work can commence until the final IEE is approved by ADB and provided to the Contractor, and the SEMP is approved by the PIU. Based on the findings of the IEE, the

classification of the project as Category “B” is confirmed. PCU will obtain environmental clearance from the Ministry of Urban Development prior to invitation of bids or award of contract.

# I. INTRODUCTION

## A. Background

1. The Urban Resilience and Livability Improvement Project (the project) aims to improve livability and sustainability of urban services by project municipalities. The project is aligned with the following impact: inclusive economic growth and improved living standards.[1] The project will have the following outcome: improved resilience, livability and sustainability of urban service delivery by project municipalities. The project will develop municipal infrastructures aligned with the priorities set in the municipalities' investment plans. The project supports seven municipalities: Tilottama, Siddharthnagar, Sainamaina, Lumbini Sanskirtik, Devdaha, Janakpur and Pokhara. The Department of Urban Development and Building Construction (DUDBC) on behalf of Ministry of Urban Development (MoUD) will be the Executing Agency and individual project municipalities will be the Implementing Agency. The project will support the following three outputs.

2. **Output 1: Municipal infrastructure for resilience improved.** Investments will use an integrated approach by ensuring a well-coordinated urban infrastructure system and, where feasible, employing green solutions to reduce inundation, improve mobility, and promote nonmotorized transport through cycle lanes and footpaths. Together, these investments aim to improve the livability of residents, support the sustainable growth of tourism, and enhance local economies. The project will (a) construct or rehabilitate 150 kilometers (km) of stormwater drains; (b) reconstruct 100 km of the urban roads with at least 45 km of footpaths with old age, women, children, and people with disabilities responsive features and cycle lane to promote non-motorized transport, and (c) construct cold storage in Tilottama to ensure food security during climate and disaster events.

3. **Output 2: Tourism assets revitalized, and management improved.** The project adopts a combination of strategic planning, infrastructure development and customer service to support natural, cultural, and heritage-based tourism by enacting protective zoning around natural and heritage sites, expanding tourism activities and promoting visitor's universal access and positive experience.[2] Output 2 will support to: (a) prepare and execute seven natural and heritage management plans through gender equality and social (GESI)-responsive, participatory approaches, (b) improve seven cultural and natural heritage sites with GESI-responsive tourism infrastructure and recreation amenities such as cycle route connecting seven lakes of Pokhara municipality, Bindabasini area street, Phewa organic trail, Pokhara Santiban Batik (Forest) conservation, Janakpur Ratnasagar, Lumbini global park, and Panchase eco-development, (c) improve 150,000 square meters of green spaces – Siddharthnagar Dandha River Corridor and greening initiatives of public spaces in all municipalities – with gender and climate-resilient inclusive design feature, and (d) ensure at least 30% of the socio-economic development program spend on socioeconomic infrastructure and activities related to tourism and GESI. The project will construct at least seven GESI-friendly public toilets in cultural and natural heritage sites and support Lumbini Sarus Crane Conservation and Biodiversity Awareness.

4. **Output 3: Capacity of communities, municipalities, province, and Department of Urban Development and Building Construction strengthened.** The project supports implementing prioritized reforms, municipalities' digital transformation, institutional strengthening and capacity building actions. Key actions of output 3 include increasing own source revenue by implementing a comprehensive financial management improvement plan (CFMIP) – an institutional reform measure for revenue enhancement (broadening own source revenue

[1] Government of Nepal, National Planning Commission. 2020. *Fifteenth-Year*. Kathmandu.
[2] Cultural, natural, and heritage assets under municipalities' jurisdiction.

coverage, digital tax billing and collection, and tax administration), budgeting procedure for better expenditure management, internal and external audit, procurement and asset management, and financial management procedures. The second action is to address carbon emissions and climate and disaster-related risks by preparing decarbonization and risk-sensitive urban plans and enforcing development control[3], preparing seven heat action plans to ensure well-coordinated response actions during an extreme heat event tailored to high-risk groups, establishing Pokhara municipal emergency operation center, installing an electronic building permit system that factors in climate and disaster-risk zoning and will also support the issuance of digital tax bills. The third action is strengthening institutions and capacity by establishing and equipping O&M units in each municipality, maintaining a robust database of public assets, including infrastructure, utilities, cultural and natural heritage sites, and public land, constructing an energy-efficient and disaster-resilient municipal office building for Lumbini Sanskrithik municipality, conducting training and workshop for staff, including eligible women staff and female-elected representatives of cities, provinces, and DUDBC, on municipal finance, natural ecosystems, decarbonization, and urban resilience planning, and support internship, skill improvement in traditional and local art, and tourist guide certification programs for women and disadvantage group implemented.[4]

## B. Subproject Scope and Location

5. This subproject covers the infrastructure improvements carried out under Output 1 of the URLIP at the Pokhara Metropolitan City. Figure 1 shows the location of the Pokhara Metropolitan City and the subprojects are identified in Table 1 below:

**Table 1: List of Road Sections under the Pokhara Subproject**

| No. | Road Location | Length |
|---|---|---|
| 1 | Damdame – Kudbi – Sidane – Bhanjyang Road | 13 kms |
| 2 | International Airport – Lakeside Fast Track Road | 8.8 kms |
| | **TOTAL** | **21.8 kms** |

Source: Pokhara Metropolitan City

## C. Purpose of Initial Environmental Examination

6. The objective of the IEE is to provide an overview of the environmental issues viz., legal compliance, environmental impacts, mitigation measures to be employed, monitoring and reporting aspects to be covered during the implementation of the Pokhara Subproject by the PCU, PIU, its Consultants and Contractors. This is to ensure that the project is implemented in an environmentally responsible manner, ensuring that all negative effects are prevented or mitigated, and positive impacts are enhanced.

## D. Methodology

7. This IEE report was prepared by carrying out site visits, conducting stakeholder consultations, and primary and secondary data collection, assessing the existing environmental conditions at the subproject locations, identifying the potential environmental impacts that may occur during project implementation and developing the relevant mitigation measures including monitoring. Baseline environmental monitoring for air quality, noise level, surface water quality and groundwater quality will be done before the start of construction activities. The Integrated

[3] Including seismic microzoning and multi-hazard disaster risk assessment of Pokhara.
[4] GESI action plan (accessible from the list of linked documents in Appendix 2).

Biodiversity Assessment Tool (IBAT) was used to screen potential risks on the protected areas or critical habitat that may exist around the project sites.

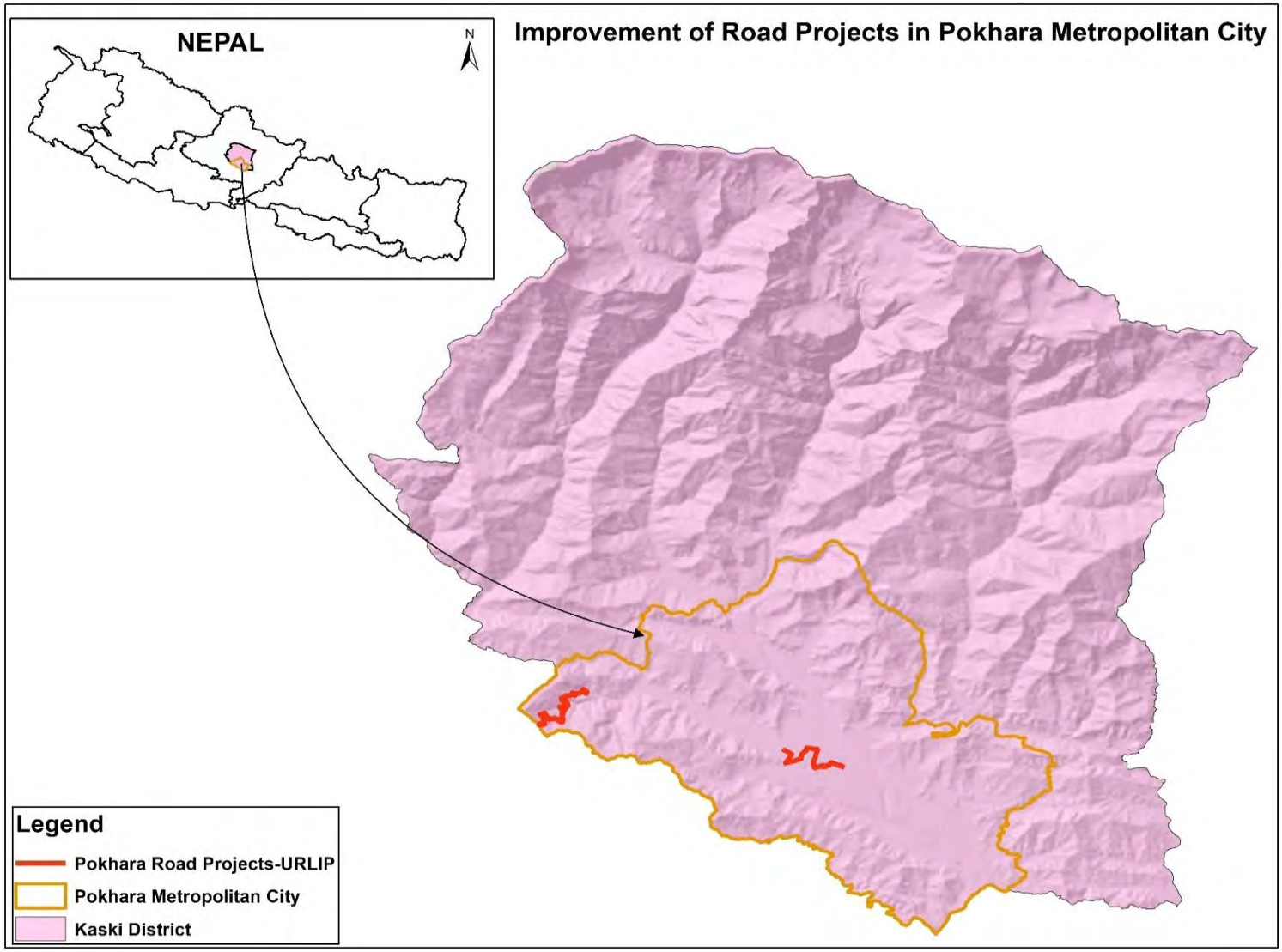
8. During the IEE study, public consultations were conducted with the ward representative, officials of respective municipalities and community people. Their views were incorporated into the IEE and in the planning and development of the subproject.

## E. Structure of IEE Report

9. The report has been structured to include the following chapters:

(i) Introduction;
(ii) Policy, Legal, and Administrative Framework;
(iii) Description of the Project;
(iv) Description of the Environment;
(v) Anticipated Environmental Impacts and Mitigation Measures;
(vi) Environmental Management Plan;
(vii) Information Disclosure, Consultation, and Participation;
(viii) Grievance Redress Mechanism;
(ix) Monitoring and Reporting;
(x) Conclusion and Recommendations.

**Figure 1: Proposed Road Improvement Works in Pokhara Metropolitan City**



# II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

## A. ADB Safeguard Policy Statement, 2009

10. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009.

11. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts. A project is classified based on the most environmentally sensitive component, and assigned with one of the four environmental categories (A, B, C, or FI) defined in the SPS. These categories are as follows.

(i) **Category A:** Project that is likely to have significant adverse environmental impacts which are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment (EIA), including an environmental management plan (EMP), is required.
(ii) **Category B:** Project with potential adverse environmental impacts that are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE), including an EMP, is required.
(iii) **Category C:** Project that is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed.
(iv) **Category FI:** Project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary.

12. Initial screening using ADB Rapid Environmental Assessment (REA) checklist was conducted for the subproject and the results of the rapid assessment show that the project is unlikely to cause any significant adverse impacts, and therefore classified under Category B per ADB SPS. Thus, this IEE report has been prepared following ADB SPS requirements for project with Category B classification.

13. **Environmental Assessment:** Environmental assessment shall include a description of environmental and social baseline to provide an understanding of current conditions forming the benchmark against which subproject impacts are assessed. Environmental impacts and risks will be analyzed for all relevant stages of the project cycle, including design and planning stage, construction, operations, decommissioning, and post-closure activities such as rehabilitation or restoration. This IEE may be used as a model document for other future roads and roadside drains subprojects.

14. **Environmental Planning and Management.** The PCU shall prepare an environmental management plan (EMP) to be included in the IEE report. The EMP shall describe and address the potential impacts and risks identified by the environmental assessment. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the subproject's impact and risks. The EMP shall include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.

15. **Public Disclosure.** The PCU shall submit the following to ADB for review, clearance and disclosure. ADB will disclose acceptable reports received and endorsed by the DUDBC on ADB website so affected people, other[5] stakeholders, and the public can provide meaningful inputs into the subproject design and implementation.

(i) Draft / Updated / Final IEE upon receipt;
(ii) a new or updated IEE and corrective action plan prepared during subproject implementation, if any, upon receipt; and
(iii) environmental monitoring reports submitted during subproject implementation upon receipt.

16. **Consultation and Participation**. The PCU and PIU shall carry out meaningful consultation[6] with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

17. **Grievance Redress Mechanism.** The PCU shall establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the subproject's environmental performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

18. **Monitoring and Reporting.** The PCU shall monitor, measure and document the progress of implementation of the EMP. If necessary, PCU will identify the necessary corrective actions, and reflect them in a corrective action plan. PCU will prepare and submit to ADB semi-annual environmental monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue until ADB issues a project completion report.

19. **Unanticipated Environmental Impacts**. Where unanticipated environmental impacts become apparent during subproject implementation, PCU shall update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

20. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the subproject the PCU and PIU shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the International Finance Corporation (IFC) World Bank Group's Environmental, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to subprojects.

[5] Per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4." Upon its receipt of acceptable safeguard documents and endorsement by PCU, ADB discloses the same on ADB website.

[6] Per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

When the government regulations differ from these levels and measures, the subproject shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, DUDBC through PCU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

21. **Occupational Health and Safety.** The PCU shall ensure that workers are provided with a safe and healthy working environment, considering risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. PCU shall ensure to take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

22. **Community Health and Safety.** The PCU shall ensure to identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

23. PCU shall ensure to apply preventive and protective measures for both occupational and community health and safety consistent with international good practice, as reflected in available national standards on Environmental, Health and Safety. Where national standards are not available, internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines will be adhered to7. PCU shall also adhere to necessary protocols in response to emerging infectious diseases such as the corona virus disease (COVID-19) consistent with the guidelines of relevant government healthcare agencies and the World Health Organization.

24. **Physical Cultural Resources.** The PCU is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources (PCRs). Such resources likely to be affected by the subproject will be identified, and qualified and experienced experts will assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed location of a subproject component is in areas where PCRs are expected to be found as determined during the environmental assessment process, chance finds procedures shall be included in the EMP.

25. **Environmental Audit.** When the subproject involves existing activities or facilities, PCU is responsible to ensure that relevant external experts will perform environmental audits to determine the existence of any areas where the subproject may cause or is causing environmental risks or impacts. If the subproject does not foresee any new major expansion, the audit constitutes the environmental assessment for the subproject.

26. **Bidding and Contract Documents.** IEE, which contains the EMP, shall be included in bidding and contract documents and verified by PIU. The PCU and PIU shall also ensure that

[7] World Bank Group, 2007. Environmental, Health, and Safety General Guidelines. Washington, DC.

bidding and contract documents include specific provisions requiring contractors to (i) comply with all other conditions required by ADB8 and (ii) to submit to PIU, for review and approval, a site specific environmental management plan (SEMP), including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation, among others as may be required. No work can commence prior to approval of SEMP. A copy of the EMP and/or approved SEMP will be always kept on site during the construction period. Non-compliance with, or any deviation from, the conditions set out in the EMP and/or SEMP constitutes a failure in compliance and shall require corrective actions.

27. **Conditions for Award of Contract and Commencement of Work.** PCU shall not award any works contract under the subproject until (i) relevant provisions from the EMP are incorporated into the works contract; (ii) this IEE is updated to reflect subproject's detailed design and PCU has obtained ADB's clearance of such updated IEE; and (iii) For GoN requirements MoUD approves Brief Environmental Study (BES)/IEE (i.e., compliance with EPR, 2020) and other necessary permits from relevant government agencies shall be obtained. For "design, build, and operate" type contracts, PCU shall ensure no works for a subproject which involves environmental impacts shall commence until (i) relevant provisions from the EMP are incorporated into the works contract; and (ii) this IEE is updated to reflect subproject's detailed design and PCU has obtained ADB's clearance for such updated IEE.

## B. National Environmental Legislations

28. Most of the national policies and laws of GoN are oriented towards achieving environmentally sound economic development and growth, and conservation of natural resources and cultural heritage of the country. The following are the summaries of the relevant policies, acts and regulations, and guidelines.

29. **The Constitution of Nepal, 2015.** This is the fundamental law of the country, and the sections pertaining with environmental protections are as follows:

30. **Article 30 (1)** of the constitution guarantees a "clean environment'' as a fundamental right and elaborates that "every citizen shall have the right to live in a clean and healthy environment".

31. **Article 30 (3)** encourages the state to formulate necessary legal frameworks to balance environment and development.

32. Nepal has enacted comprehensive range of environmental policies and laws that cover a broad range of environmental and sector issues. Environmental Protection Act (EPA) of 2019 and Environmental Protection Regulations (EPR) of 2020 are two important legal frameworks for environmental protection. According to the EPA and EPR, all development projects should first be screened using criteria that are based on the scale of project stipulated in the Schedules 1, 2 and 3 of EPR to determine the level of environmental assessment required. Projects that could result in some environmental impacts are required to conduct Brief Environmental Study (BES), projects having the moderate environmental impacts are required with Initial Environmental Examination (IEE), and large projects that could result in major and adverse environmental

[8] Contractors to comply with (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites..

impacts are required to go undergo an Environmental Impact Assessment (EIA) process. The EPA makes necessary arrangements to disclose EIA reports to the general public to render opinions and suggestions.

33. **Environment Protection Act 2019 (2076 BS).** The act emphasis on new aspects like provisions of BES, IEE and EIA under the jurisdiction of local authority, provincial government, and central government. This act is pre-requirement for any type of development project in the country to comply the environment safeguards. Article 2 (3) 1 of this act has given provision of environmental assessment. This clearly mentions that the environment assessment is prerequisite before implementation of any project. The detail of the criteria is indicated in Environment Protection Rules 2020.

34. **Environment Protection Rules 2020 (2077 BS).** This rule has defined thresholds and equivalent environmental assessment (i.e., BES, IEE and EIA). As per EPR 2020, for the upgrade, expansion, rehabilitation and reconstruction of 10 to 50 km length national highway or feeder road requires Initial Environmental Examination (IEE). In addition to this, the establishment of cold storage with the capacity to store more than 1000 metric tons requires IEE. As per EPR 2020, following requirement are necessary for IEE.

**Table 2: Subprojects Requiring Environment Assessment as per GoN-EPR, 2020**

| S.N. | Subproject Component | Parameter | Unit | Total Quantity | Environment Study Requirement (EPR,2020) |
|---|---|---|---|---|---|
| 1 | Damdame – Kudbi – Sidane – Bhanjyang Road | Length | kms | 13 | BES |
| 2 | International Airport – Lakeside Fast Track Road | Length | kms | 8.8 | BES |

35. Other relevant government laws and regulations. The implementation of subprojects proposed under the project will be governed by government environmental acts, rules, policies, and regulations.

36. Table 3 summarizes the applicable national and local laws, regulations, and standards for environmental assessment and management, including applicable international environmental agreements.

**Table 3: Relevant Government Laws and Regulations**

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| 1 | **Fifteenth Five Years Plan, 2020−2024, Nepal** | • Requires all projects to be formulated and constructed basedon methods that optimally utilize local skills and resources andgenerate employment opportunities.<br>• Attention is paid towards minimizing the impacts of climate change and protecting environment. It aims to minimize adverse impacts on people, property, culture, environment and economy by disasters.<br>• The policy aims to integrate disaster risk management in all development activities in order to reduce loss of people and property. |
| 2 | **National Transportation Policy, 2058 BS** | • The principal objective of the National Transport Policy is to develop a reliable, cost effective, safe facility oriented and sustainable transport system that promotes and sustains the economic, social, |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| | | cultural and tourism development of Nepal as a whole.<br>• For the attainment of the above through and objectives the following strategies will be followed: (i) The Government shall clearly indicate the limit and scope of work to be done from the central level and take responsibility of transport structure to be constructed from the central level. (ii) Making the decentralized governance system more strengthened and by maximum utilizing the source and means of local level, the development and promotion of transport system shall be done from the local level itself. (iii) Maximum private Sector involvement will be encouraged in the expansion and preservation of the transport system. |
| **3** | **Forest Act 2076 (2019)** | • Pertaining to the chapter 12, Section 42(1), if there is no other alternative to the using of forest area for the operation of a national priority project, plan of which investment is approved by the Investment Board, project of national pride and it appears from the environment examination referred to in the prevailing law that the operation of such plan does not result in significant adverse effects on the environment, the Government of Nepal (GoN) may give approval, as prescribed, to use any part of the national forest for the purpose of operating such plan,<br>• Similarly, in providing the forest area for the operation of a plan pursuant to sub-section (1), to the extent possible, a land that is adjoining to the national forest area near the project site and situated in the same geographical and ecological belt and has such landscape where forest can be developed shall be provided for the purpose of planting trees at least in the area equal to the forest area that has to be used. |
| **4** | **Forest Regulations, 2079 (2022)** | • Pertaining to Rule 87 (2) in case of the development project related to the use of forest land, the coordination has to be done with the concerned division forest office during the feasibility study and environmental study.<br>• Rule 88, Application needs to be submitted in case of use of national forest land from the feasibility study and application need to submitted to the Ministry of Forests and Environment through the subjective ministry<br>• Rule 89, following Rule 88, the Ministry of Forests and Environment direct Division Forest Office through its respective department for the detail field information and that information should also be submitted to provincial ministry.<br>• Rule 90, following Rule 89, Division Forest Office should submit the information with field monitoring (if necessary) to the Ministry of Forests and Environment. The ministry will ensure the use of forest land if the applicable information and letters are received and give permission to the respective project by binding in the rule's states in the Forest Regulations.<br>• Rule 91, following the Rule 90, after the decision made by the government of Nepal for the permission to use the forest land, development project should make the availability of the applicable land for the forest development as per the Forest Act (2076), Section 42 (2).<br>• Rule 92, following Rule 91, in case of failure in the availability of the applicable land, it has to go through the Land Acquisition Facilitation |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| | | Committee in the district level.<br>• Rule 93, following the Rule 92, in case failure of the land acquisition through the Committee respective department should give permission to the project for the Collection of amounts in the government fund as per the land purchases for development project specified in Shedule-51.<br>• Rule 93 (5), the compensation of loss of 1 tree loss should be made with plantation of 10 trees with the amount base on the cost of the trees in the ratio of 1:10 and Rule 93 (5), the amount must include bi-annual production or purchase of trees, trees transportation, afforestation of 1600 trees per hectare, fencing and boundary for the protection of trees and require number of people for look after. |
| 5 | **Conservation Area Government Management Area Rules 2001** | • Contains a number of regulatory measures to minimize environmental impacts within the forests, national parks, wildlife reserves and conservation areas. Prior to implementation, the EPA 2076 B.S. (2019 AD) requires a proponent to undertake BES, IEE or EIA for a proposed project and have the report approved by the concerned ministries. The introduction of the exotic species on the specific location may requires an IEE before the implementation of the project as per the EPR, 2020 Appendixes 1, 2 and 3 Rule 3 a, b, and c. |
| 6 | **Water Resource Act, 1992** | • Water Resource Act, 1992 of clauses 3, 7, 18, 20, 22 and 24 implies state ownership of any surface/stream bodies of Nepal and stresses the utilization of water resources by any individual or organization without causing harm to others. It embodies that the Government of Nepal can fix, monitor and formulate regulations pertaining to water quality standards, pollution tolerance levels and development of water resources. It prohibits any action that may pollute water resources surpassing the threshold value. It has prioritized use of water resources in the successive order: drinking/domestic use, irrigation, fishery, electricity, water transport, and recreation. It urges that utilization of resources should be carried out without causing any considerable damage to the environment such as soil erosion, floods, landslides and other similar natural hazards. The Act fails to address the license mandatory for the extraction of water even from the land owner. |
| 7 | **Water Resource Regulation, 1993** | • Water Resources Act was published in Nepal Gazette in (2050/5/1). Persons, who interested to use the water resources on institutionalized basis, may form a consumer's association consisting of at least Seven persons as officials and members. There shall be a Water Resources Committee in each District for the purpose of issuing license pursuant to Sub-section (1) of Section 8 of the Act in order for the utilization of Water Resources contained within Nepal. Government of Nepal, may, giving due consideration for the types, structure, capacity of the project relating to utilization of wat16 of the Act, prohibit from using the house or land situated within the area of the project specifying the fixed distance for the site for a specified worker resources for the purpose of Sub-section (3) |
| 8 | **Irrigation Rules, 2000 (Amendment in 2060)** | • Irrigation Rules, 2000 Chapter 2 has the provision of the formation of the user's association in a format as prescribed in schedule –1 and the procedure for the transfer of the project. Under Rule 12, |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| | | Users' association may plant trees on the side or right of way of a Canal, Branch or Secondary Canal, Minor or Tertiary Canal, Water course or Field Channel after the approval of community forest work - plan according to the prevailing Forest Act and Rules from the concerned Forest Office. In the course of determining the place for plantation there shall be coordination with concerned Irrigation Office. Until the work plan pursuant to Sub rule (1) is approved, Users' Association may sell the rotten or fallen trees lying on the side of Canal, Branch or Secondary Canal, Minor or Tertiary Canal, Water course or Field Channel and the trees which need pruning may be pruned upon the approval of committee.<br>• Similarly, under Chapter 6, there is the provision of irrigation project which shall be constituted to implement the large-scale irrigation project as designated by the GoN. It also deals with the function, duties and power of the designated project committee, staff and the establishment of the Project Unit Office. |
| **9** | **Irrigation Policy (2013)** | • Irrigation Policy document sets out the rationale for subsector development and policy objectives and approach for project development, water user associations, irrigation service charges and irrigation system operation and maintenance |
| **10** | **Soil and Watershed Conservation Act, 2039 BS** | • In order to properly manage the watersheds of Nepal, the Soil and Watershed Conservation Act 1982 was enacted. Section 3 of the Act empowers GoN to declare any area as a protected watershed area. Section 4 of the Act provides that a watershed conservation officer has the authority to implement the following works in protected watershed areas:<br>• Construct and maintain dam, embankment, terrace improvements, diversion channels and retaining walls,<br>• Protect vegetation in landslide-prone areas and undertake afforestation programs, and<br>• Regulate agricultural practices pertinent to soil and watershed conservation.<br>• Under Section 10 of the Act, power is extended to the Watershed Conservation Officer to grant permission to construct dams, drainage ditches, canals, cut privately owned trees, excavate sand, boulders and soil, discharge solid waste, and establish industry or residential areas within any protected watershed. The Act outlines the essential parameters necessary for proper watershed management (including rivers and lakes). The Act is applicable to protected watersheds. |
| **11** | **Soil and Watershed Conservation Regulations, 2042 BS** | • In exercise of the powers conferred by Section 25 of the Soil and Watershed Conservation Act 1982, the GoN has framed Soil and Watershed Conservation Regulations, 2042 BS. Pursuant to sub-rule (1) of rule 10 natural calamity clause (a), (b), (c), (d), (e), (f), (g) of section 10 of the Act and (h) if anyone has to do the work mentioned in the reason to do so. An application has to be submitted to the Watershed Conservation Officer in the format of open schedule 4 (2) After receiving the application as per sub-rule (1), the watershed protection officer in case of any action contrary to the purpose of the Act, in the format of Schedule 5 as per schedule. will allow. |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| 12 | **National Wetlands Policy – 2059 (2003 AD)** | • Wetlands policy has been formulated for planned conservation, maintenance and development of the country's wetlands, while providing support to economic, social and cultural development of local communities by improving their living conditions through wise use of these wetlands. Nepal has shown its commitment to wetlands conservation, specially the conservation of waterfowl habitats of international importance, by signing the Ramsar Treaty 1971. The policy is also in conformity with the directives of the signatory nations passed by the contracting parties in 1996, regarding the mobilization of local communities for their active participation in the management of wetlands listed in the Ramsar Site as well as other wetlands and their watershed areas. |
| 13 | **Water Induced Disaster Management Policy 2015 (2072)** | • The latest policy of GoN which recognizes the climate change as one of the main causes for the water induced disaster in Nepal.<br>• This policy is introduced to achieve the objectives of the National Water Resources Strategy and National Water Plan on water induced disaster management sector through participation and coordination of public, cooperatives and private sector institutions. It encourages people to participate with voluntary contribution of land for flood protection works.<br>• It has the main objective of making the infrastructures sustainable and has the policy on involving communities, cooperatives and private sector. It stresses the need for medium and long-term disaster prevention and control programs and make them climate resilient and environment friendly. |
| 14 | **Land Acquisition Act, 2034 BS (1978AD)** | • Government can acquire land at any place in any quantity by giving compensation pursuant to the act for any public purposes or for operation of any development project initiated by government institutions. |
| 15 | **Labor Act, 2074 (2017 AD)** | • This labor Act was made under the management of parliament under sub-clause 1 of clause 296 of Constitution of Nepal. Sub-section 3 of Section 2 states that the employees should not be compelled to other work other than they are assigned for. In addition, Sub-section 5 of Section 2 states about prohibition of child labor in any organization and sub-section 6 of Section 2 states that there should not be any kind of discrimination among the employee's regard of religion, ethnicity, gender, origin, language or intelligence or other kind of characters. |
| 16 | **Child Labor (Prohibition and Regulation) Act, 2056 (2000 AD)** | • As per section 3 of this act, no child having not attained the age of 14 years shall be engaged in works as a laborer. |
| 17 | **Solid Waste Management Act, 2068 (2011 AD)** | • This act has been formulated with a goal of minimizing solid waste production from the target area by setting rules and regulation on solid waste management (SWM) in the country in order to develop better environment for the systematic and effective management of solid waste and to involve all the concern stakeholders in SWM practice. The main features of this act are discussion of 3R principle (Reduce, Reuse and Recycle). 3R principle seems to be very beneficial as it not only increases the life of landfill site but also save the money, which could be used for other infrastructure development. Section 4 of the act assign the local body to manage |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| | | or use the solid waste discharged or dumped in collection center, transfer station or treatment plant or collected during cleaning. |
| 18 | **Solid Waste Management Rules, 2070 (2013 AD)** | • The SWM Rules was formulated as per the provision made in article 50 of the Solid Waste Management Act, 2068. This regulation has emphasized the segregation of waste at source, and mentioned that the responsibility of proper disposal, and management of source belongs to the producers themselves. Section 3 of the rule describes the segregation, and management of solid waste. It has been mentioned that it is essential to segregate degradable, and non-degradable solid waste at the source. |
| 19 | **National Ramsar Strategy and Action Plan, Nepal (2018-2024)** | • The 'wise use of wetlands' is the core concept orienting the work of the Ramsar Convention that refers to "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development" (Ramsar2016). Nepal gained experience to intervene in this concept through the Conservation and Sustainable Wise Use of Wetlands Resource initiative (2007-2012). Government further opts this notion of wise use in compliance with objective 3.3.2 and operational strategy 5.2 of NWP (2012). Wise use is the heart of this strategic plan. |
| 20 | **Ancient Monument Preservation Act, 2013 (1956) and Rules, 1989 (and amended till date)** | • It was enacted to integrate the conservation and protection of ancient monument and archeological properties. The act mentions any ancient monuments and artistic objects of hundred years old shall be regarded archeologically important objects and Department of Archeology (DoA) shall preserve such objects.<br>• As per the Act and rules, works as such excavation, laying of water, sewer lines, repairing road etc., in the monument protection / conservation zone., require prior permission of Department of Archaeology. Application in the prescribed format need to be submitted to DOA. |
| 21 | **The National Parks and Wildlife Conservation Act, (1973AD)** | • This Act deals with the conservation and management of wildlife and habitat. The Act restricts entry into national parks without prior permission of the concerned authority. Hunting of animals or birds, building or occupying houses, shelters or structures, occupying, clearing or planting or growing in any part, cutting, felling, removing or overshadowing any tree and removing any quarry or any other activities in national parks are banned.<br>• Wildlife Reserve Regulation, 1977, entry, construction of houses or sheds, clearance of forest and forest products, quarrying and overnight stay in a reserve area is prohibited unless authorized in writing by the relevant GoN authority.<br>• Buffer Zone Management Regulation, 1994, clearance of forests and forest products, acquisition of land, use of quarry sites and hunting in buffer zones is restricted unless written approval of the relevant GoN authority is obtained. |
| 22 | **Local Self Governance Act (1999AD)** | • This Act gives Local Government the functions, duties and power to, among others; (i) conserve and protect their local environment and natural resources; (ii) plan, implement and / or operate and maintain local water supply projects; (iii) implement and / or arrange for implementation local sanitation / sewerage and drainage projects; (iv) protect cultural heritage and religious sites and / or (v) monitor project activities within their jurisdictions. |

| S.N. | Policies, Acts, Regulations, Guidelines | Relevant Provisions |
|---|---|---|
| 23 | **National Tourism Act (1978AD)** | • This Act facilitates to increase tourist arrival in the country and encourages tourists and their handling agents in Nepal to minimize environmental impact during their visit. The Act also shows serious concerns about visitors' health, facilities and welfare and empowers the Government to generate tourism revenue and establish plough-back mechanism for tourism infrastructure development. |

37. **National Ramsar Strategy and Action Plan (2018-2024)** The Plan covers the background of wetlands including Ramsar sites management practices in Nepal; the existing institution, policies and practices for Ramsar Implementation in Nepal; strengths, weaknesses, opportunities, and threats analysis and finally the Ramsar Strategic Plan of Nepal. The Goal of the National Ramsar Strategy and Action Plan is to ensure that the Nepal's Ramsar sites are conserved, wisely used, restored benefits are recognized and valued nationally and globally.

38. The Action Plan aims at achieving the following key objectives:

(i) To effectively conserve and manage the Ramsar site network;
(ii) To manage wetlands including the Ramsar site at the footprint of wisely use principle;
(iii) To engage federal, state and local stakeholder and capacitate them for the wetlands and Ramsar sites conservation;
(iv) To enhance the Ramsar implementation through the national and international cooperation; and
(v) To monitor and evaluate the implementation of the National Ramsar Strategy and Action Plan.

39. To achieve the objectives, the Plan considers thirteen priority areas for the next seven years much like the priority areas of the Ramsar Convention. National Ramsar Strategy and Action Plan (2018-2024) represents 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. Likewise, the report outlines the National Ramsar goals and key actions with relevant tools, actors, baselines and indicators in Nepal.

## C. International Environmental Agreements

40. Table 4 below lists of the international environmental agreements that Nepal is party to, and their relevance with the current subproject.

**Table 4: International Environmental Agreements and standards ratified by GoN**

| International Convention | Year* | Relevant Provisions | Remarks |
|---|---|---|---|
| World Heritage Convention | 1978 | Parties to ensure the protection and conservation of the cultural and natural heritage situated on territory of, and primarily belonging to the State. World Heritage sites are identified as per this convention. | The project components will not impact physical cultural resources and natural heritage during project implementation and operation. |
| Convention on Wetlands of | 1987 | Parties to conserve and wisely use wetlands (i.e., maintaining | Lake Cluster of Pokhara Valley (a cluster of 9 lakes), the largest |

| International Convention | Year* | Relevant Provisions | Remarks |
|---|---|---|---|
| International Importance Especially as Waterfowl Habitat (Ramsar Convention) | | their ecological character) as a contribution towards achieving sustainable development locally and throughout the world. This convention will identify the Ramsar areas. | Ramsar Site in Nepal, is located within one km of the two project components. However, in terms of proximity, only the Phewa Lake amongst the 9 lakes is within one km from the project components. The other 8 lakes are beyond the 1km radius from the project area. |
| Convention on Biodiversity (CBD) | 1992 | Parties to require the environmental assessment of projects that are likely to have significant adverse effects on biological diversity with a view of avoiding or minimizing such effects. The CBD also identified thebiodiversity identified the hot spot areas. | The project will not impact biodiversity hot spot area in the country. |
| United Nations Framework Convention on Climate Change (UNFCCC) | 1992 | Parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverseeffects. | The project components will be designed to mitigate the flooding impacts arising from climate change through appropriate design of the drains along the road network taken up for improvements in Pokhara. |
| Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal | 1996 | Parties to, among others, minimizethe amount and toxicity of hazardous waste generated, manage the hazardous and other wastes they generate in an environmentally sound manner and as close as possible to the source of generation. | The project will ensure implementation of its EMP as measure to avoid or minimize the generation and disposal of any hazardous wastes. |
| Convention on International Trade in Endangered Species of Wild Fauna and Flora | 1975 | Parties to control the trade of certain wildlife species to prevent further endangering of their survival. CITES classifies species according to the following criteria viz., species threatened with extinction; species which could become endangered; and species that are protected.<br>Nepal is rich in biodiversity and has number of protected species | IBAT reports are generated for all project components to ensure the conservation and protection of endangered species of wild fauna and flora. |
| International Labour Organization (ILO) Convention of Indigenous and all Peoples | 2007 | Highlights the need to recognize indigenous and tribal people's specific knowledge, skills and technologies as the basis for their traditional economies and self-determined development process. | Applicable to projects where indigenous and tribal peoples are present. |

**(Year) - Year last amended.*

## D. Applicable Environmental Standards

41. National Ambient Air Quality Standards for Nepal, 2003. As shown in the table below, the air quality standards for Nepal have set standards for 7 parameters: total suspended particles (TSP), PM10, Sulphur Dioxide (SO2), Nitrogen Oxide (NO2), Carbon Monoxide (CO), Lead (Pb) and Benzene.

42. The World Health Organization (WHO) Air Quality Guidelines has set quality standards for 4 parameters PM10, PM2.5, SO2 and NO2. According to ADB SPS 2009, when host country regulations differ from international levels and measures, the project will achieve whichever is more stringent. Both policies provide guidelines and comply with the more stringent standards during construction period.

**Table 5: Standards for Ambient Air Quality for both GoN and WHO**

| Parameter | Averaging Period | Nepal's Ambient Air Quality Standard ($\mu g.m^3$) * | WHO Air Quality Guidelines ($\mu g.m^3$) ** | |
|---|---|---|---|---|
| | | | Global Update 2005 | Second Edition^ 2000 |
| TSP | Annual | - | - | - |
| | 24-hour | 230 | - | - |
| $PM_{10}$ | Annual | - | 20 | - |
| | 24-hour | 120 | 50 | - |
| $PM_{2.5}$ | 1-year | - | 10 | - |
| | 24-hour | - | 25 | - |
| SO2 | Annual | 50 | - | - |
| | 24-hour | 70 | 20 | - |
| | 10-minutes | - | 500 | - |
| $No_2$ | 1-year | 40 | 40 | - |
| | 24-hour | 80 | - | - |
| | 1-hour | - | 200 | - |
| CO | 8-hour | 10,000 | - | 10,000 |
| | 15-minutes | 100,000 | - | 100,000 |
| Pb | 1-year | 0.5 | - | 0.5 |
| Benzene | 1-year | 20 | - | - |

*Source: *National Ambient Air Quality Standard for Nepal, 2003. Obtained from Environment Statistics of Nepal, 2011, National Planning Commission Secretariat, Central Bureau of Statistics, Nepal. **Environmental, Health and Safety General Guidelines, 2007. International Finance Cooperation, World Bank Group.*
*^Air Quality Guidelines for Europe, Second Edition, 2000. WHO Regional Office for Europe, Copenhagen.*

43. Emission standard for diesel generator EPR-14, 2020. The emissions standards set for new DGs imports is equivalent to Bharat Stage III standards, and for in-use DGs is equivalent to Bharat S Inventories and Black Carbon Emissions in Kathmandu Valley, Nepal. Emissions standards are set for 4 major pollutants: CO, HC, NOx, and PM. National Noise Standard Guidelines, 2012. The guidelines have set the standards for noise levels, measured in dBA, for industrial, commercial, rural residential, urban residential, mixed residential and quiet areas. It also has provision of standard values for the noise level generated by water pumps and DG as well.

44. For international standards, WHO Noise Level Guidelines has set the noise levels measured in dBA for two areas residential and commercial areas. The project will achieve whichever is more stringent. Both policies provide guidelines to follow and comply with the more stringent standards during construction period.

**Table 6: Standards for noise levels for both GoN and WHO**

| Receptor/Source | National Noise Standard Guideline 2012 (dBA) | | WHO Guidelines Values for Noise Levels Measured Out of Doors*(One Hour $LA_q$ in dBA | |
|---|---|---|---|---|
| | Day | Night | 07:00-22:00 | 22:00-07:00 |
| Industrial Area | 75 | 70 | 70 | 70 |
| Commercial Area | 65 | 55 | | |
| Rural Settlement Area | 45 | 40 | 55 | 45 |
| Urban Residential Area | 55 | 50 | | |
| Mixed Residential Area | 63 | 55 | | |
| Quiet Area | 50 | 40 | - | - |
| Water Pump | 65 | | - | |
| Diesel Generator | 90 | | - | |

*Guidelines for Community Noise, WHO, 1999

## III. DESCRIPTION OF THE SUBPROJECT

45. Following two road projects have been proposed under URLIP in Pokhara Metropolitan City (PMC): (i) Pokhara International airport to lakeside fast track road and (ii) Damdame-Kudbi-Sidane-Bhanjyang road. The road connecting the international airport to the lakeside is an alternative route, most of which is already blacktopped and requires upgradation and addition of road safety and additional road components. Damdame-Kudbi-Sidane-Bhanjyang road, which is also known as Panchasse road has a total length of 13km. Description of the road projects is as follows and is mainly based on the information provided by the municipal officials based on their preliminary proposals as the design of road components have not yet commenced.

### A. International airport to Lakeside (Phewa) fast track road (8.8km.)

46. The road starts from Lakeside (Phewa Lake) which is one of the most popular destinations of tourists visiting Pokhara. Recently, with the establishment of Pokhara International Airport (PIA) and due to the existing narrow Seti River bridge, the lag time for the traffic in the highway has increased significantly. The Prithivi Highway is under construction and the expansion work in road approaching Pokhara is soon to start which will lead to even more traffic congestion. The traffic from the PIA is highly contributing the traffic jams. Hence, an alternative route for traffic using PIA seems vital. Besides, the proposed route will provide easy access for the beneficiaries using Hariyokharka Hospital and Institute of Forestry Pokhara Campus.

47. The road alignment extent is from Sahidchowk –Mustang chowk- Radhakrishna marga-SOS village–Ghalechowk–Nayagaun–Kantipur marga–Falepatan–International Airport. The proposed route is about 8.8 km long and has three section: (i)3 km from lakeside-mustang chowk-Road Transport Office (RTO) road-Tinkune- Radha Krishna marga, (ii) 4.5 km within ward 15, and (iii) 1.3 km of airport approach road. The RTO section is recently asphalted by PMC. The point of intervention begins at Radhakrishna Marga in ward 7. The road has a clear width of 11m with 8 m at some points (ward 15).

**Table 7: International Airport to Lakeside fast track road existing and proposed improvements**

| S. No. | Components | Existing Scenario | Proposed Improvements |
|---|---|---|---|
| 1. | Length of Road | 8.8 kms | 8.8 kms |

| S. No. | Components | Existing Scenario | Proposed Improvements |
|---|---|---|---|
| 2. | Right of Way (ROW) Declared by municipality | Sahid Chowk to Tinkune = 80 ft<br>Tinkune-Gharipatan-SOS section= 30 ft<br>Radhakrishna-Ghalechowk-Nayagaun-Kantipur = 60 ft<br>Phalepatan-Airport approach road =30 ft | Same as existing. |
| 3. | Total Road Width | Varies from 6.5 m to 11m | 12 m (8 m carriageway+1.5m footpath at both sides+0.5 m drains at both sides), footpath and drain width may vary at already existing sections. |
| 4. | Carriageway | Average 8.75 m | A minimum of 8m with expanded widths in existing wide sections |
| 5. | Pavement type | Mostly Blacktopped with few concrete road sections | Double lane upgradation with the 40 mm surface course of asphalt concrete, 100 mm of base course and 150 mm of subbase course with proper grade and camber |
| 6. | Side Drain | Side tick drains are provided along the most chainage with PCC covered drains at some sections. Size of side drains is not adequate and storm water overflows in the rainy seasons. | PCC surface drain of width (0.4 m - 0.5m water way) will be provided as per necessity. |
| 7. | Cross drainage Structures | Bridge, Slab Culverts, Side RCC Slabs | Cross drainage structures like slab culvert, hume pipes, may be provided as required |
| 8. | Protection works | Retaining walls at some locations | Retaining wall/slope protection measures as per requirement. |
| 9. | Traffic signs/signage and road marking | Traffic signs and signals at some sections. | Provided all along the road to ensure maximum safety to pedestrian and vehicular traffic. |
| 10. | Road furniture (streetlights, delineators etc.) | At some sections. | Streetlights, delineators to be provided for safety. |
| 11. | Utility | Electric poles on the footpath section of the road. | Shifting of electric poles is necessary depending upon the design width of road. |

Source: Pokhara Metropolitan, June 2023

### B. Damdame- Kudbi-Sidane-Bhanjyang road (Panchase Road, 13 km):

48. Road starts from Damdame which is connected by the newly blacktopped road being constructed by PMC. The proposed road alignment will connect the tourism center Panchase, which is a natural greenery protected area enriched with biodiversity and ponds. The targeted Panchase area is a famous destination where yearly religious festivities are also organized and thousands of pilgrims from nearby districts visit the place. The route is a way to various homestays established by the local Gurung communities and a cultural museum.

49. Pokhara metropolitan city has been constructing 3 km of road from Ghatichina-Damdame under the support from provincial government. The proposed road under URLIP is 13 km and starts from the end point of currently constructing road at Damdame village. The track opened has almost a clear width of 9 m all along the road extent with exception at 5-point locations of Kudhidanda, Damdame and Sidane with of 6m. Few sections of the road are concreted and three culverts have been constructed in the route by PMC. Some retaining structures and drain is being constructed by PMC.

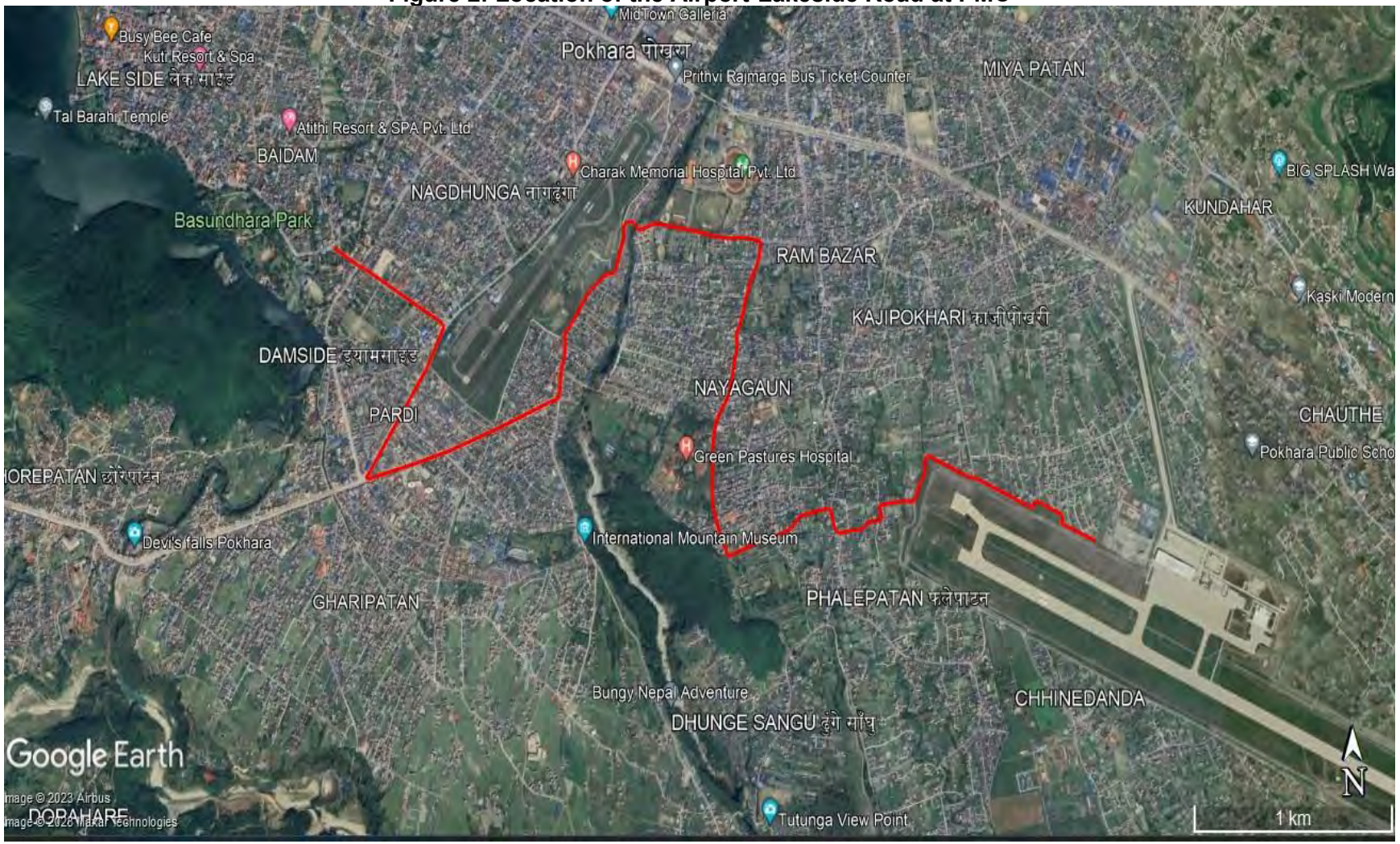
50. A large portion of the existing road is earthen road. During rainy season, the road contributes to a large quantity of sediment flow into the Phewa Lake that has adverse impact on the wetland ecosystem.

**Table 8: Damdame-Kudbi-Sidane-Bhanjyang existing and proposed Improvement**

| SN | Elements of component | Existing Scenario | Proposed Improvements |
|---|---|---|---|
| 1. | Length of Road | 13 km | 13 km asphalt road connecting **Damdame, Kudbi, Sidane to Bhanjyang** |
| 2. | Right of Way (ROW) Declared by municipality | Row is 14 m in the proposed road section | Same as existing. |
| 3 | Total Road Width | 7-9 m | 8 m |
| 4. | Carriageway | Average 7 m | 7m with 1m drain |
| 5. | Pavement type | Earthen and few sections of the road are concreted | Double lane upgradation with blacktopped of 40 mm surface course of asphalt concrete, 100 mm of base course and 150 mm of sub base course. |
| 6. | Parking | No parking zones | Can be provided at Bhanjyang where the blacktop road ends. |
| 7. | Side Drain | Existing side drains at some sections. | PCC surface single drain of 1m width (0.4 water way with 0.3+0.3 – plum wall) |
| 8. | Cross drainage Structures | 3 Culverts | Cross drainage structures like slab culvert, Hume pipes, RCC slabs may be provided as required. |
| 9. | Protection works | Retaining walls at some locations | Retaining wall/slope protection measures as per requirement. |
| 10. | Traffic signs/signage and road marking | Nil | Provided all along the road to ensure maximum safety to pedestrian and vehicular traffic. |
| 11. | Road furniture (streetlights, delineators etc.) | Nil | Steel railings/guard rails for road safety |
| 12. | Utility | There are 2-3 electric poles on the route. | Shifting of electric poles might be necessary depending upon the design width of road. |

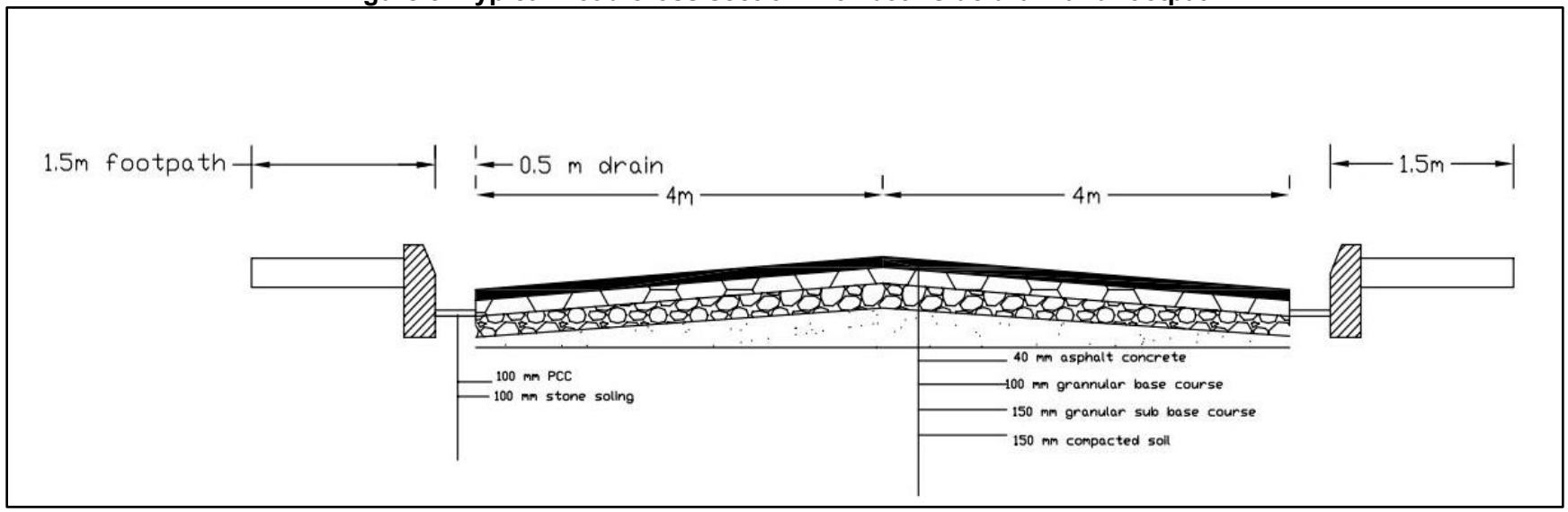
Source: Pokhara Metropolitan, June 2023

**Figure 2: Location of the Airport-Lakeside Road at PMC**



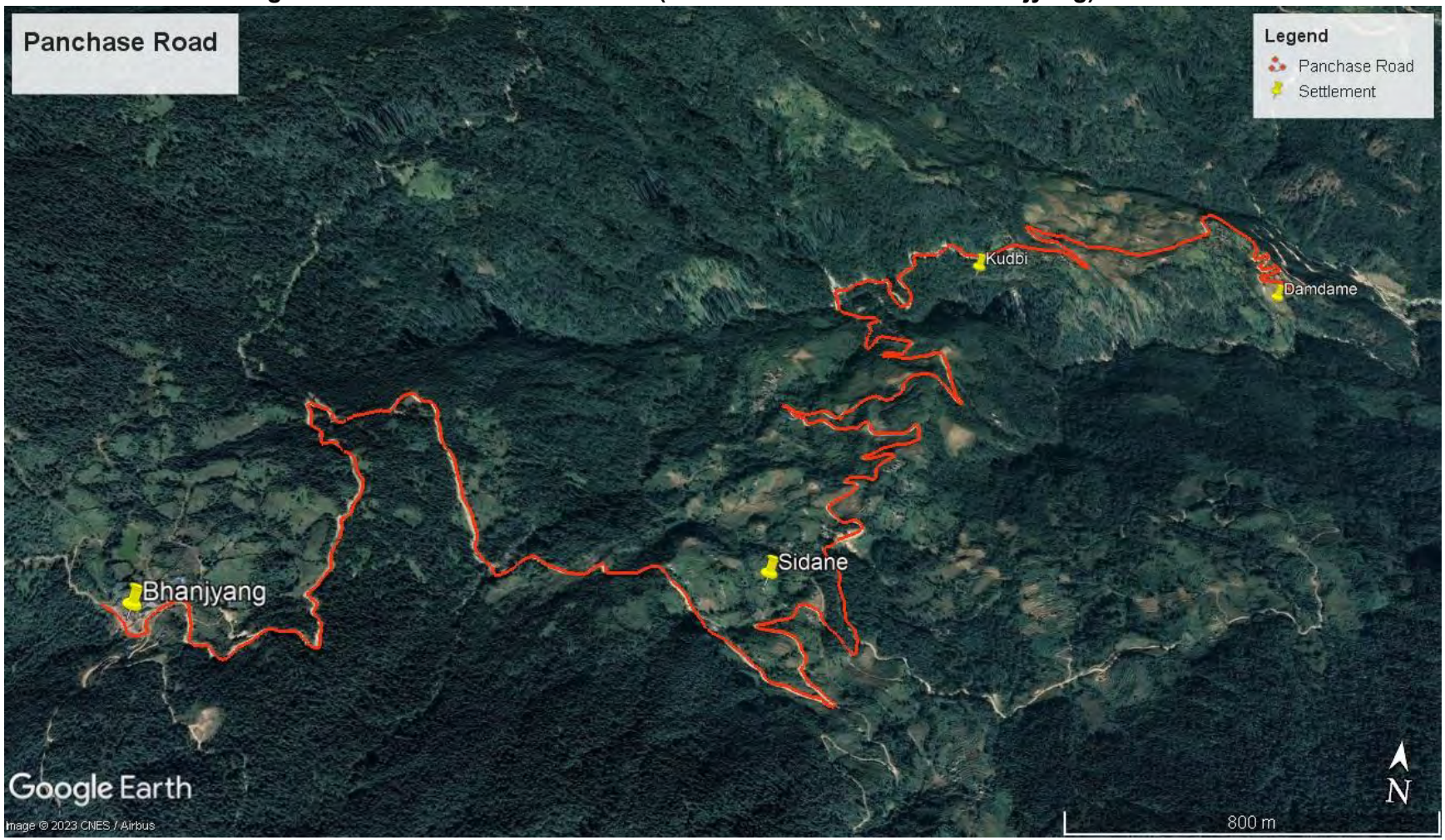

*Source: Google earth image and road alignment from Pokhara Metropolitan City*

**Figure 3: Typical Road cross section with both side drain and footpath**



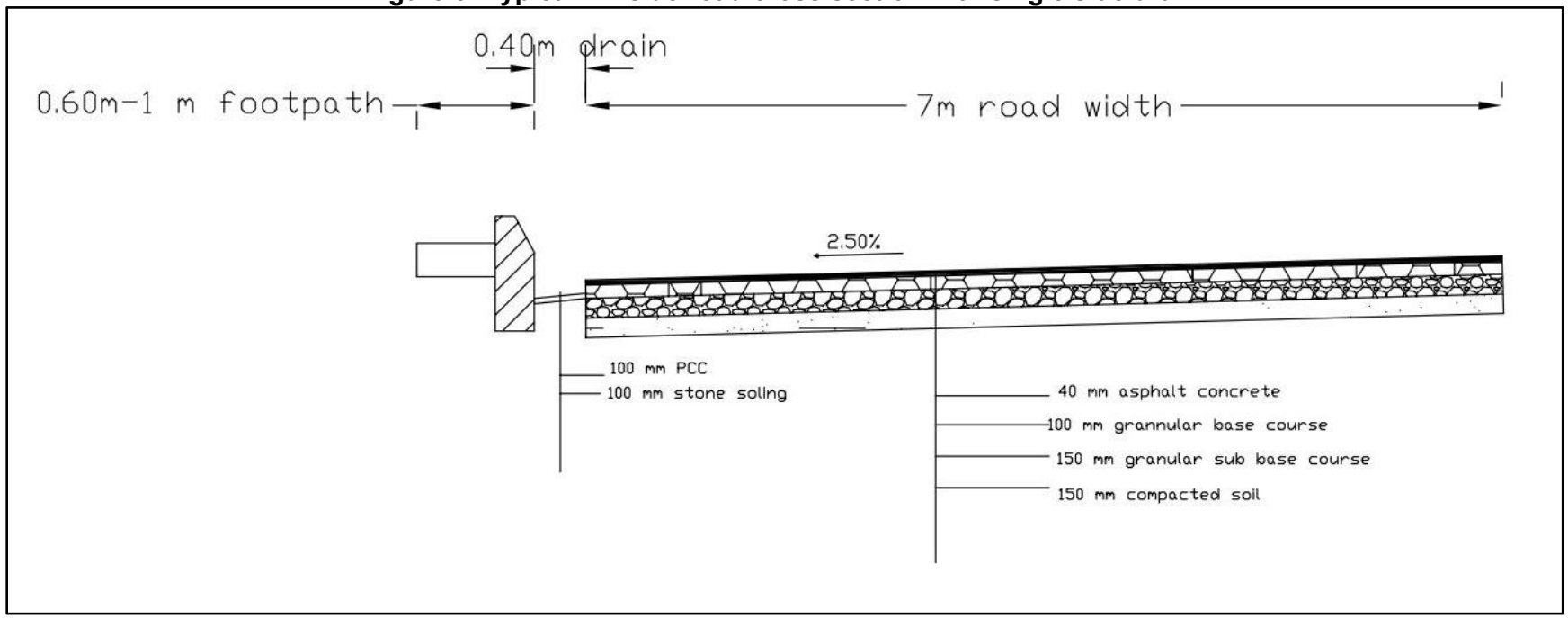

*Source: Pokhara Metropolitan City*

**Figure 4: Location of the Panchase (Damdame- Kudbi-Sidane-Bhanjyang) Road**




*Source: Google earth image and road alignment from Pokhara Metropolitan City*

**Figure 5: Typical hill side road cross section with single side drain**




*Source: Pokhara Metropolitan City*

# IV. DESCRIPTION OF THE ENVIRONMENT

## A. Baseline Information

51. The primary objective in this chapter is to provide an environmental baseline of the proposed subprojects in Pokhara Metropolitan City. Baseline data includes an inventory of physical, ecological and socio-economic parameters. Baseline environmental data presented in this chapter are based on available secondary information. No sampling for air quality, noise and water quality was conducted. Baseline environmental monitoring for such will be conducted before the start of construction.

52. The primary impact area will be confined along the alignment of the roads. Delivery of construction materials to the site would extend the project influence area. This means that during transport of construction materials, the impact area is extended along the roads being traversed by the transporting equipment.

## B. Physical Environment

53. **Location.** Pokhara is located in central Nepal and is capital of Gandaki Province and headquarters of Kaski District. It is the second most populace state after the capital city Kathmandu. The metropolitan city is spread over an area of 464 sq. km and has a population of 599,504 (2021 census). The city is located about 200 km west of Kathmandu.

54. **Topography.** The subproject lies in Pokhara Metropolitan City (PMC) of Kaski District which is the part of Pokhara valley and lies in plain as well the slope part of hill around the valley. The valley is in bowl shape and covered by hills and the valley plains. The proposed Panchase Road with length of 13 km is located at the western hilly area of the Pokhara town. The road starts from the Ghatichina at elevation of 990 m above mean sea level (msl) and passes through the four villages Damdame (1262 m above msl), Kudbi (1370 m above msl), and lower Sidane (1450 m above msl) and upper Sidane (1680 m above msl) located at hill slope area. The panchase road last point ends at the hilltop area with open gentle land stretch (Bhanjyang) with an elevation of 2070 m (above msl). The road entirely falls in ward 23 of the PMC. The proposed Airport to Lakeside Road is located at the center of the Pokhara Valley on flat land area with elevation between 810 m to 820 m above msl. This road falls in wards 7,14,15 and 17 of the PMC.

**Figure 6: Pokhara Metropolitan City**

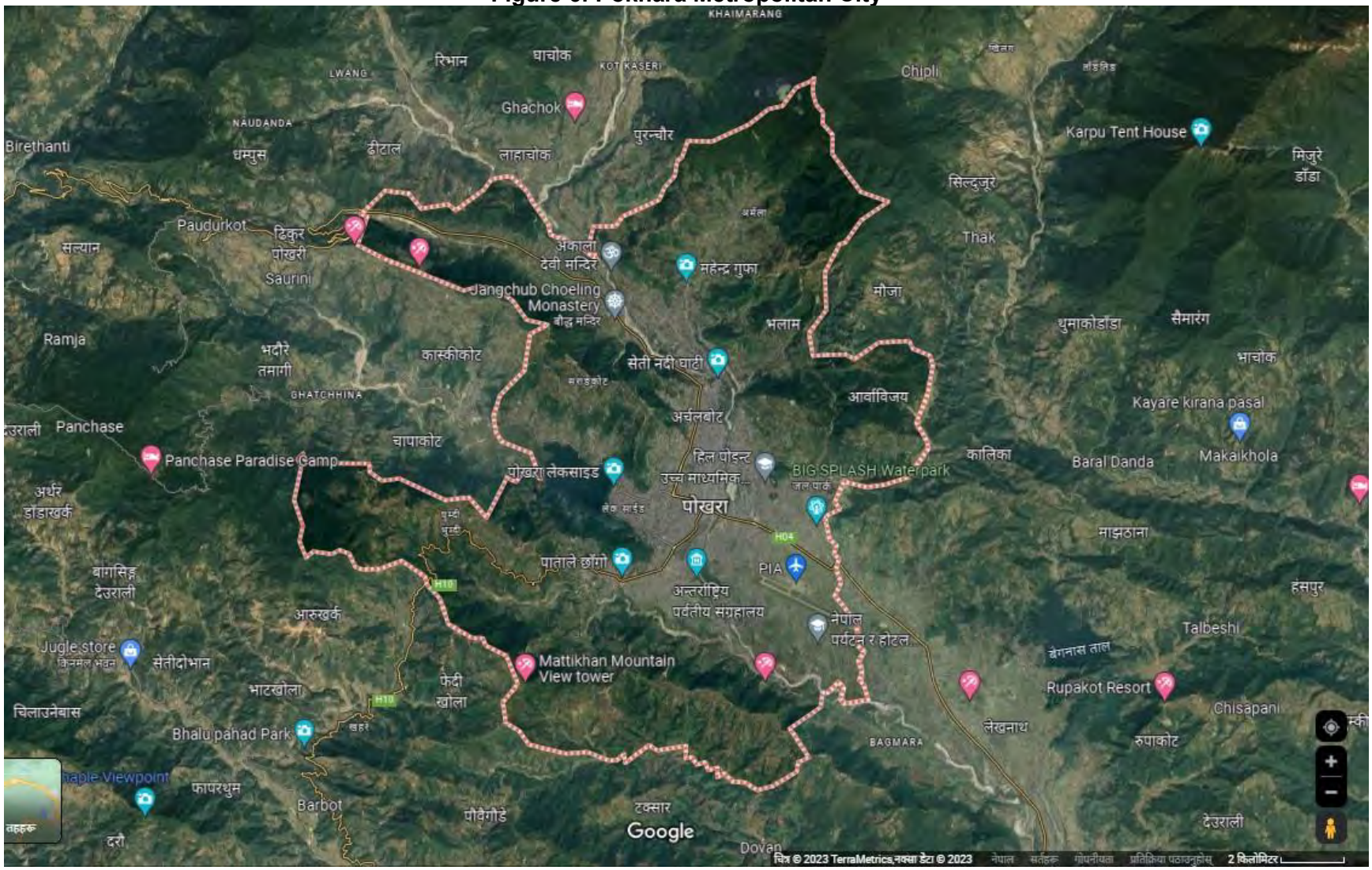


**Figure 7: Location of the Proposed Road Projects in Pokhara Metropolitan City**

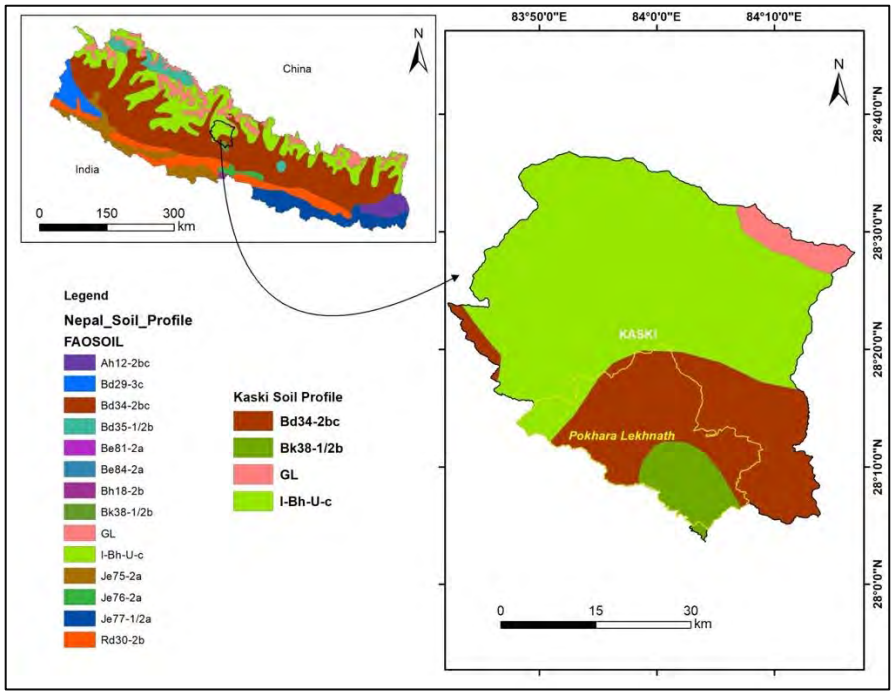
55. **Geology and Soil.** The proposed road project in Pokhara Metropolitan City and its surrounding region originated from the breaking of glaciers in the Annapurna range, which subsequently became filled with layers of debris. The valley bed comprises layers of debris that have accumulated over different geological periods, primarily due to glacial activities. The basement geology of the area primarily comprises phyllite and quartzites of the Kunchha Formation. On the valley floor of the Lekhnath area, there are quaternary Alluvial and Fluvio-Glacier deposits. These deposits consist mainly of silt, sand, gravels, and breccias, with the grain size decreasing towards the foothill areas. The study reveals that the valley floor of the Lekhnath area is mostly composed of 2-3 layers of alluvial sediment, reaching depths of up to 80 meters or more, which overlay weathered to fresh phyllitic bedrock. The alluvial sediments primarily consist of gravel, sand, and sandy gravels, with the grain size decreasing towards the foothill areas. Based on the general soil map, Pokhara Metropolitan City has Dystric Cambisols, Calcic Cambisols, Glaciers and Ice Caps and Lithosols, Humic Cambisols and Randers types of Soil.

56. **Weather and Climatic Condition**. The climate of Pokhara Metropolitan City is sub-tropical; however, the elevation keeps temperature moderate with summer temperature of 25 to 35°C and -2 – 15°C in winter. Broadly, climate can be divided into two different types that include sub-tropical and temperate. Sub-tropical climates are the main characteristics of lower altitude whereas temperate climate prevail in higher parts of the valley. As the main city, the airport link road and airport lie in the valley floor, climatic condition is therefore of sub-tropical type. The recorded highest temperature is 35°C in hot summer season and minimum recorded temperature at mountains and hills is 2-3°C in January. Pokhara has the highest rainfall over the country. The average annual rainfall of Pokhara is 4,700 mm and 80 percent of precipitation occurs in June through September.

57. **Air Quality.** Baseline data on air quality for the subproject area is not available. The subproject location is in a mixed-use area (residential, commercial and institutional). There are no heavy polluting industries in the area. Non-point sources of air pollution in the subproject site include emissions from vehicles, and dust from loose soil. The contractor will be required to establish the baseline air quality before the start of construction.

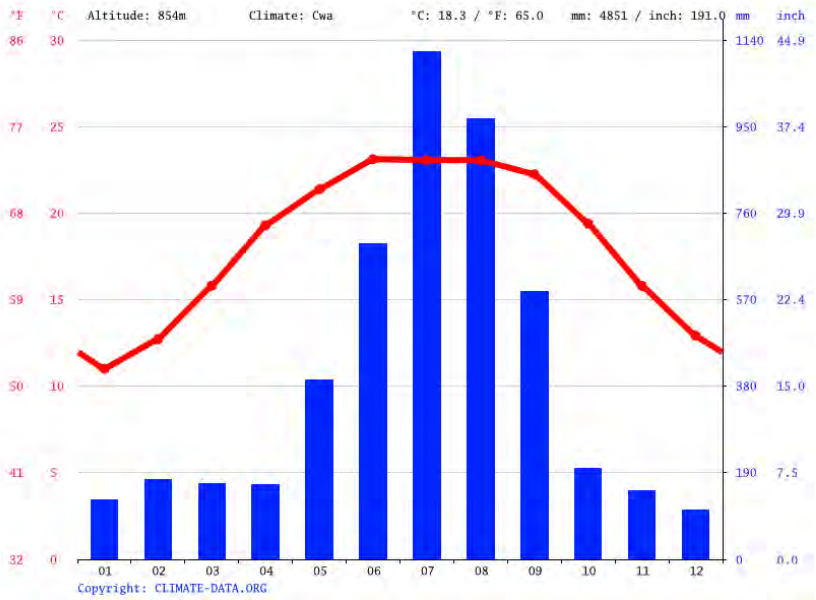
58. **Noise Level.** Baseline data on noise is not available for the subproject area. Some sources of noise pollution in the subproject site may include motor vehicles, construction work, audio entertainment systems, loudspeakers and noisy people. The contractor will be required to establish the baseline noise levels before the start of construction.

**Figure 8: Soil Map of Project Area-PMC**




Sources: FAO, 2023

**Figure 9: Monthly Temperature & Precipitation, 1991-2020, Pokhara**




*Sources: Climate Change Knowledge Portal, 2023*

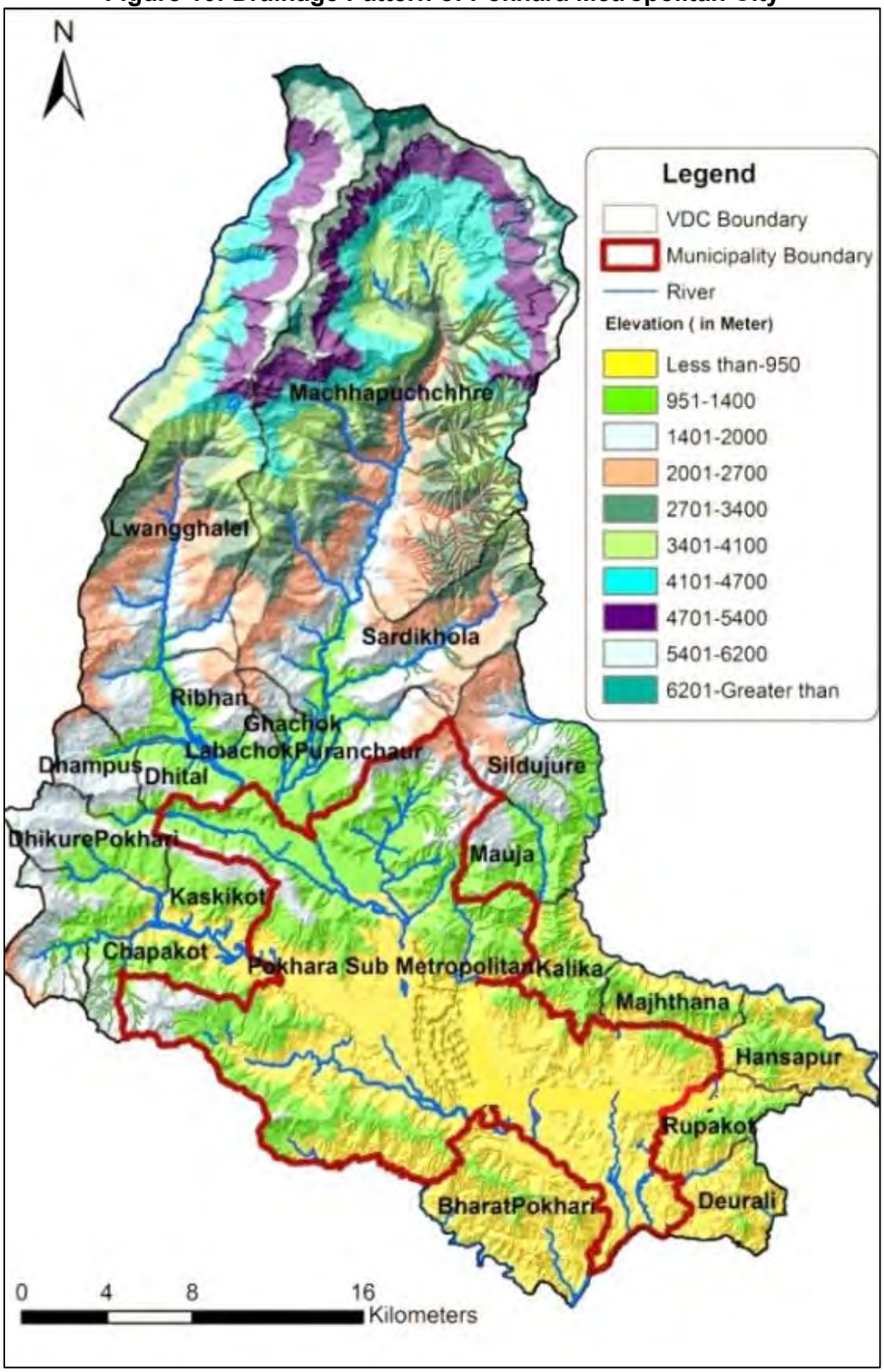
59. **Hydrology, Surface water and Lakes.** The main rivers within the hydrological drainage basin of the Kaski District consist of the Seti, Madi, and Bijayapur rivers, along with their tributaries. There are numbers of small streams in the hill areas around Pokhara City. Therefore, it is crucial to consider the surface drainage system when designing, upgrading, or reconstructing the proposed road section in the subproject area. The drainage pattern of the project area is illustrated in the Figure 10. The Panchase road crosses 5-6 local streams with existing culverts and joins to Harpan Khola, that feeds to Phewa Lake. The other Airport-Phewa Road cross a Seti River with an existing bridge.

60. Pokhara valley consists of nine lakes, which include Phewa, Kamalpokhari, Gunde, Khaste, Neureni, Dipang, Maidi, Begnas, and Rupa lakes (Figure 11). These lakes cover an area of 262 $km^2$ with the water bodies covering an area of 9 sq. km. Lake Phewa is the largest in the cluster and the second largest in the country. Phewa lake, located to the northwest of the main city at the base of high hills. The lake receives its surface water from rivers and streams, primarily through surface runoff and groundwater recession. The average inflow varies from 1.0 $m^3$/sec to 9.0 $m^3$/sec. The largest contributor to the lake's inflow is the Harpan Khola River, accounting for about 70% of the total. The lake's main outflows occur at the Pardi Dam, where two canals divert water for irrigation over an area of approximately 320 hectares and supply water to a 1 MW capacity hydropower plant.[9] The stream networks and watershed area of the Phewa lake is presented in map (Figure 12).

61. Surface runoff often leads to flooding in the core areas of Pokhara city, such as Mahendrapool, Prithvi Chowk, Srijana Chowk, and Palikhe Chowk. Consequently, managing stormwater poses a significant challenge in these areas. A study conducted by Basnet et al. (2020) revealed that most of the drainage flows into water courses, including the lake, streams (Khola), and irrigation canals. The resistivity of the aquifer materials in this region ranges from 103 to over 1775 ohm-m, with aquifer thickness varying from 34 meters to more than 200 meters. The average calculated porosity of the aquifer material is 17.32%.

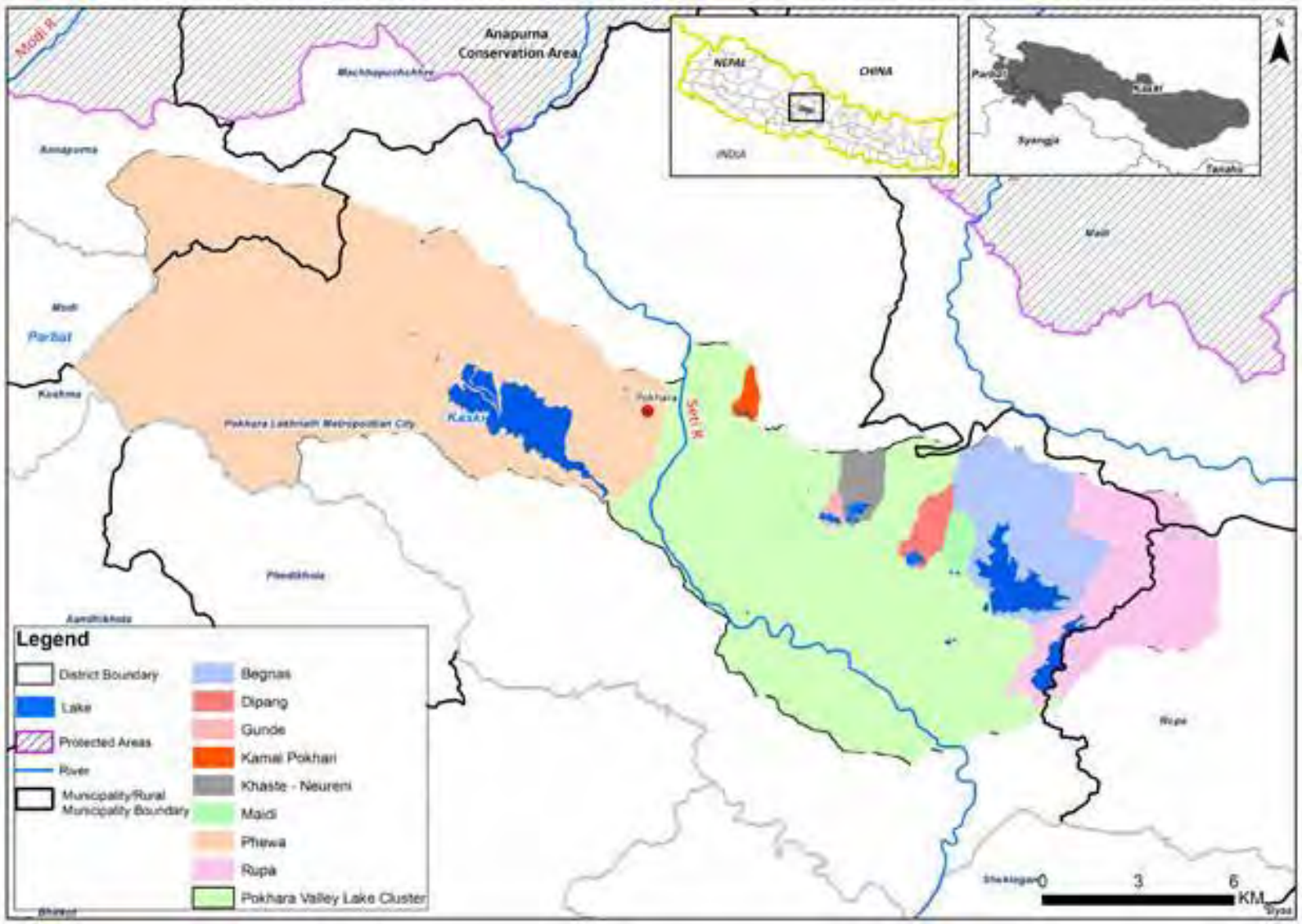
[9] Hydrological and Hydraulic Analyses of Urban Storm Water Drainage System of Pokhara, 2020

**Figure 10: Drainage Pattern of Pokhara Metropolitan City**



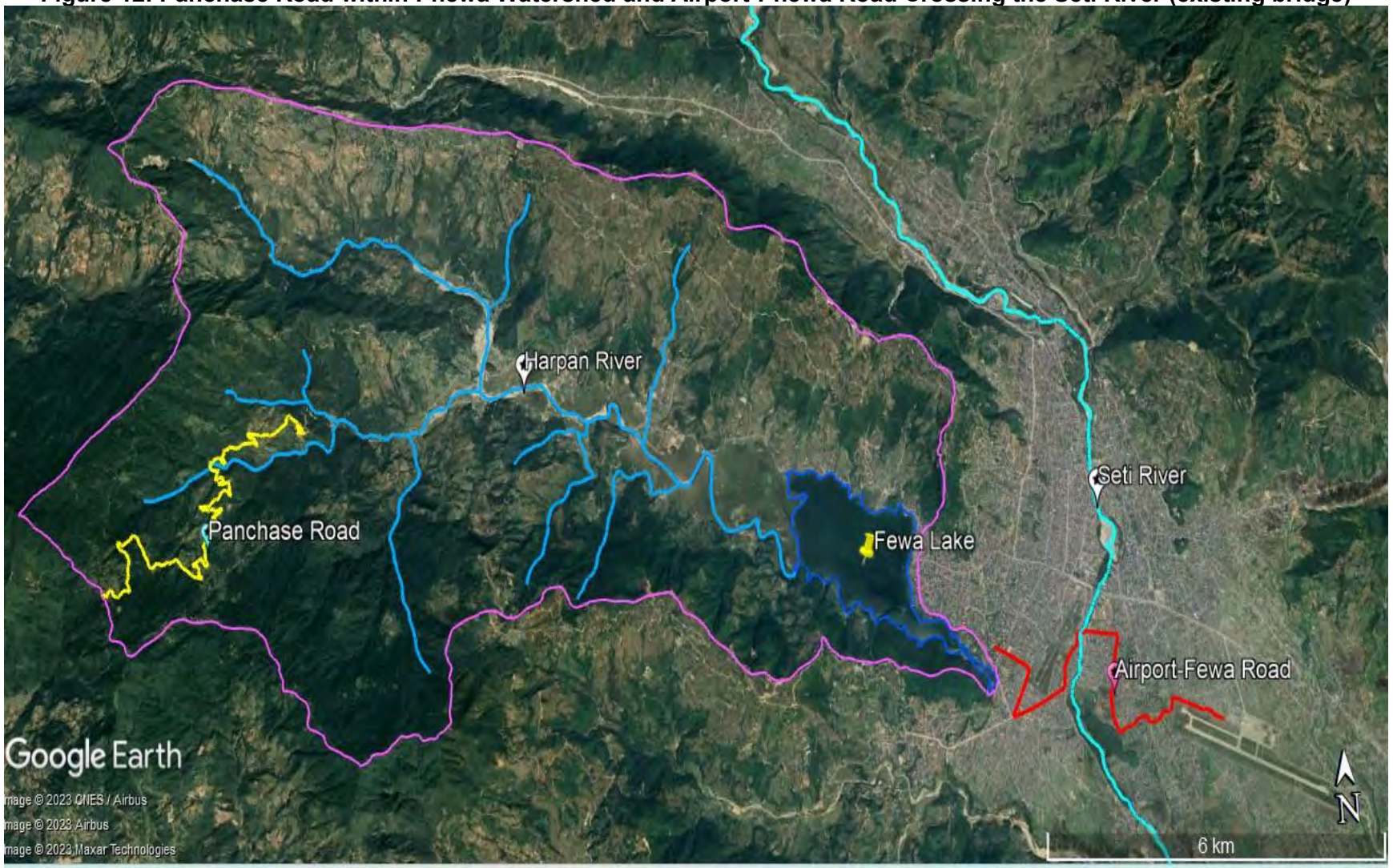

Sources: Department of Survey, 2020

**Figure 11: Location of the Lake Clusters in Pokhara Sub-Metropolitan City**




Sources: Department of Survey, 2020

**Figure 12: Panchase Road within Phewa Watershed and Airport-Phewa Road Crossing the Seti River (existing bridge)**




*Sources: Google Image and Road Alignments from PMC*

## C. Biological Environment

62. The road projects of the Pokhara Metropolitan City do not lie within any protected areas and the ecologically sensitive areas. Airport-Phewa Road is in the core city area and road section passes all along the settlement area and there are no forest areas. Whereas the Panchase road 51% passes along the agricultural and settlement area and 49% of the road lies within the Panchase forest area.

63. **Panchase Forest.** The Panchase Forest Ecosystem (PFE) is a significant forested area in the Middle Mountains, which has been considered as the Panchase Protection Forest Area by the Forest Office. Covering an approximate area of 10-12 square kilometers, the Panchase Forest is located at the intersection of Kaski, Parbat, and Syanja districts in western Nepal. Local communities of all three districts holds the Panchase Forests and its mountain peak (2509m) in high esteem as a sacred landscape with religious importance for both Hindus and Buddhists. About 6 km of the Panchase Road sections passes through the Panchase Forest area. The Panchase watershed serves as the primary source for several local watersheds, including the Phewa Lake Watershed (Figure 13).

64. **Vegetation.** As per local consultations, major vegetations within the Panchase forest area are Chilaune (*Schima wallichi*), Katus (*Castanopsis indica*), Uttis (*Alnus nepalensis*), Kyamuno (*Eugenia operculata*), Siris (*Albizzia lebbeck*), Mauwa (*Engelhardia spicata*), Sisau (*Dalbergia sissoo*), Mauwa (*Engelhardia spicata*), Teak (*Tectona grandis*) and Kadam (*Neolamarckia cadamba*) and Orchids (family *Orchidaceae*). Similarly, the herbs common in the project area are Harro (*Termnalia chebula*), Barro (*Terminalia bellirica*), Amala (*Emblica officinalis*), and Pipala (*Piper longum*). Harro and Barro are endangered species.

65. **Mammals and Herpetofauna.** As per local consultations, the most common wild animals found in the Panchase Forest area are Chituwa (*Panthera pardus*), Ban Biralo (*Felis Chaus*), Nyauri Musa (*Herpestes Javanicus*), Syal (*Canis aureus*), Rato Badar (*Macaca mulatta*), Kharayo (*Oryctolagus cuniculus*), Bandel (*Sus scrof*a), and Dumsi (*Hystrix indica*). Chituwa is classified under CITES Appendix I. Some herpetofauna found in the project area are Bhyaguta (*Duttaphrynus melanostictus*), Cheparo (*Calotes versicolor*), Krait (*Bungarus caeruleus*) and Dhaman (*Ptyas mucosa*).

66. **Fishes.** Seti River, Harpan Khola, Bijayapur Khola, and Phewa Lake are the major water sources nearby project areas. Some of the of fish species found in nearby water bodies of the project area are Asla (*Schizothrax spp*), Budhuna (Gotyla) (*Garra gotyla*), Rohu (*Labeo rohita*), Titai (*Psilorhynchus sucatio*) and Bhakur (*Labeo catla*).

67. **Wetlands in Pokhara.** The Pokhara name itself was derived from “Pokhari”, which is meant for Pond in Nepali vernacular- one of the wetland types. The valley itself is one of the most popular tourism destinations in Nepal, where natural heritages, especially lakes and mountain are main tourist attractions. It is also known as the “City of the Lake”. The Lake cluster consists of nine lakes: Phewa, Begnas, Rupa, Dipang, Maidi, Khaste, Neurani, Kamalpokhari, and Gunde. All the nine lakes are listed as Nepal's Ramsar sites, declared on 2 February 2016.

68. Wetlands serve as valuable resources for tourism and recreation, often holding sacred significance. These habitats support diverse plant and animal species. The Lake cluster in the Pokhara valley holds international significance due to its support for vulnerable, endangered, and critically endangered species, as well as threatened ecological communities. Unfortunately, the lakes face several threats, such as pollution and increased sedimentation caused by

deforestation, urban expansion, and road construction in the surrounding areas. Implementation of the proposed upgrading work of the road with drainage management will also contribute to improving the area with control of the sediment flow.

69. **Integrated Biodiversity Assessment Tool (IBAT).** The project area is located within close proximity to certain protected areas. Specifically, there are two protected areas within a 1 km radius, known as the Lake Cluster of Pokhara Valley. and 10 km (Annapurna Conservation Area) from the project area. Also, there is a world heritage site (Chitwan National Park) within 50 km buffer from the project area. There are 2 key biodiversity are within the 10km (Annapurna Conservation Area) and 50 km (Rampur Valley) buffer from the proposed areas (Figure 14). The species number found in the proposed periphery in the IUCN Red List are of 27 species. There is likely of existence of critical habitat nearby project area. Additionally, 13 are found to be of restricted range species.[10].

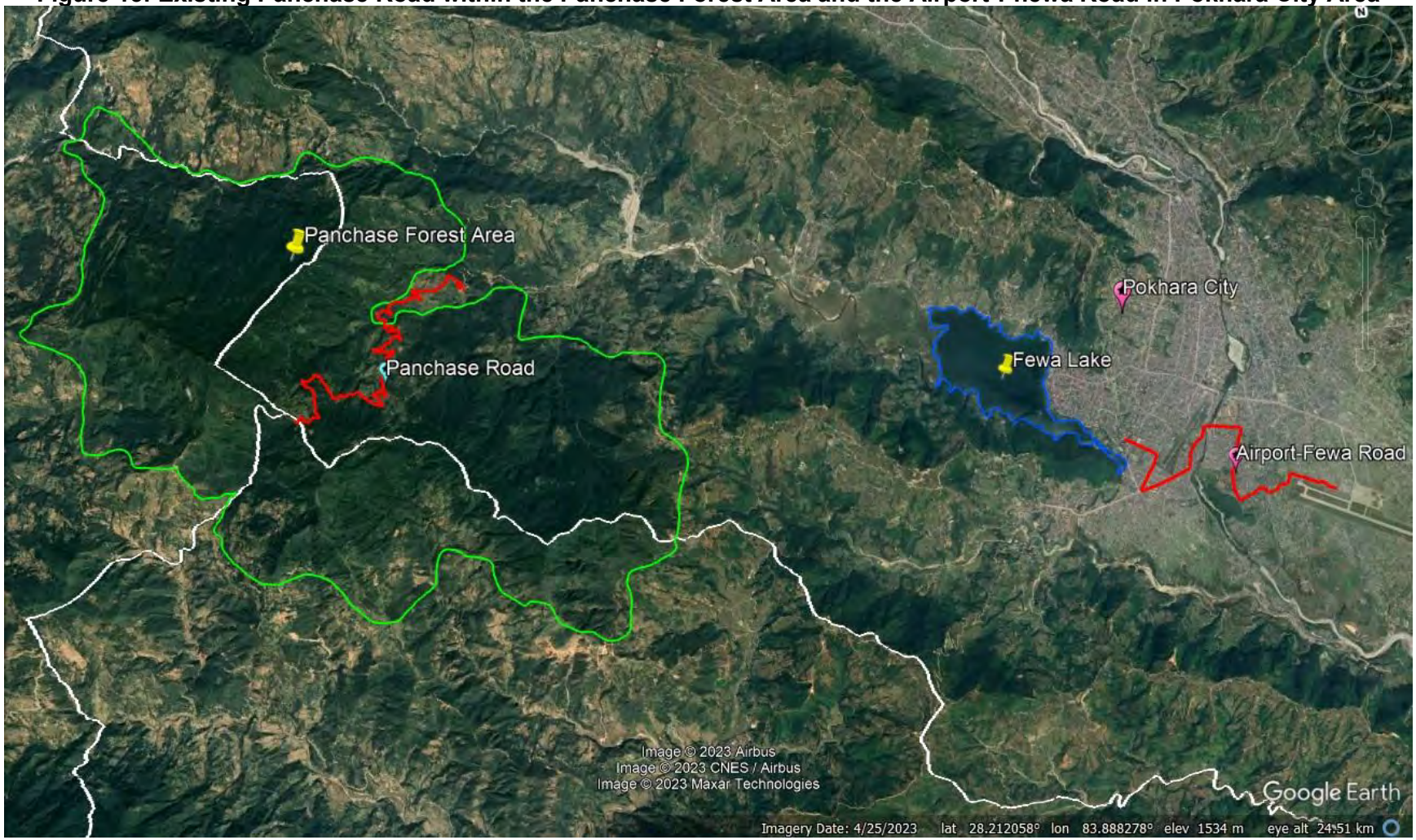
70. **Water Birds in Ramsar Lakes.** In context of Pokhara valley, 467 bird species have been recorded till the date (Ghimire et al. 2019), that includes Nepal's endemic species i.e., Spiny Babbler (*Acanthoptila nipalensis*) and 11 globally threatened species. Pokhara Valley is preferred habitat for globally critically endangered species such as Yellow-breasted Bunting (*Emberiza aureola*), Red-headed Vulture (*Sarcogyps calvus*), Slender-billed Vulture (*Gyps tenuirostris*), White-rumped Vulture (*Gyps bengalensis*), Long-billed Vulture (*Gyps indicus*) and Baer's Pochard (*Aythya baeri).* (Dhakal et al. 2019, Ghimire et al. 2019).[11]

71. A total of 101 avian species belonging to 13 order and 34 families were recorded from Khaste lake complex during the study period. Total 33 species of water birds, of which 14 residents and 19 migratory birds were recorded. Among them, 17 species were wader followed by swimmer 10 species, aerial forger 4 species, and diver 2 species. Six globally threatened species including three critically endangered viz. Slender-billed Vulture (*G. tenuirostris*), White-rumped Vulture (*G. bengalensis*) and Yellow-breasted Bunting (*E. aureola*), two endangered Egyptian Vulture (*Neophron percnopterus*) and Steppe Eagle (*Aquila nipalensis*), one Vulnerable Asian Woollyneck (*Ciconia episcopus*) and one Endemic species Spiny Babbler (*A.nipalensis*) were recorded. (Ghimire and Paudel, 2020).[12]

72. There are no impacts to protected or conservation areas, birds or any aspect of the biological environment arising from the implementation of the project. Panchase Road implementation does not require any cutting of the trees as the road alignment work has already been completed and no changes in the road alignment is envisaged in the detailed design. The Airport to Lakeside Link Road, will impact a few Peepal (Ficus religiosa) trees. At these locations, road / drain alignments will be modified to protect the trees. Hence, no cutting of trees is envisaged from the implementation of the two project components.

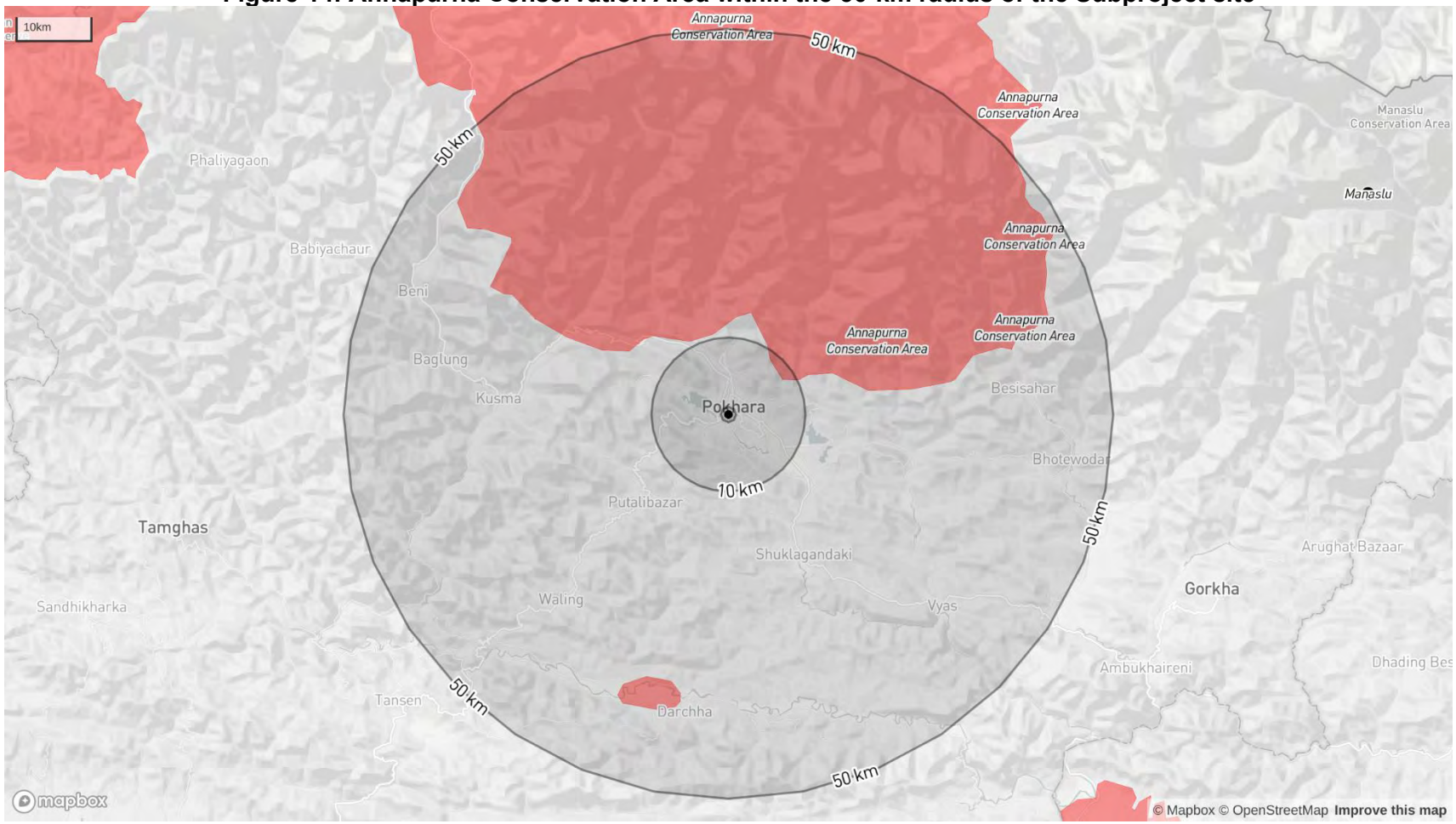
[10] IBAT PS6 & ESS6 Report (2023)
[11] Ghimire, M., Chaudhary, H. and Dhakal, H. (2019) Birds of Pokhara Valley, Pokhara Bird Society, Pokhara-6, Nepal.
[12] Dhakal, H., Ghimire, M., Poudel, A. K., Ghimire, P., & Bhusal, K. P. (2020). Avian Diversity of Khaste Lake Complex, Pokhara Valley, Nepal.

**Figure 13: Existing Panchase Road within the Panchase Forest Area and the Airport-Phewa Road in Pokhara City Area**




*Sources: Google Image and Road Alignments from PMC*

**Figure 14: Annapurna Conservation Area within the 50-km radius of the Subproject site**




*Source: IBAT PS6 & ESS6 Report, 2023*

## D. Socio-economic and Cultural Environment

73. **Land Use and Cover.** The proposed Panchase roads project area consists of settlements, agricultural lands and forest area. The 13 km of road alignment with width of 7-9 m is clear all along the stretch. There will be no. impact to the Panchase forest area since the road track is already opened and the proposal is for the upgradation work with blacktopped of 40 mm surface course of asphalt concrete, 100 mm of base course and 150 mm of sub-base course. The land use pattern along the Panchase Road is shown in Table 9. About 6 km of the road sections passes through the Panchase Forest area. Whereas the Airport to Lakeside Road of 8.8 km stretch passes through the settlements area only. There will be no impacts to the vegetations in the upgradation of two road projects. The current land use of the Pokhara Metropolitan City is broadly categorized as water body, vegetation cover, riverine deposit, built up area, crop land, bare soil, and shrub land. Out of total area cover by PMC, 50.28% of land is covered by vegetation, 38.09% is covered by cropland and remaining by shrub land, water body, bare soil, and riverine deposit (Table 10 and Figure 15).

**Table 9: Present Land Use of the Pokhara Metropolitan City**

| Chainage | | Land use along the Panchase Road |
|---|---|---|
| 0+000 | 2+500 | Agriculture and settlement Area |
| 2+500 | 4+000 | Panchase Forest Area |
| 4+000 | 7+200 | Agriculture and settlement Area |
| 7+200 | 7+600 | Panchase Forest Area |
| 7+600 | 8+600 | Agriculture and settlement Area |
| 8+600 | 13+000 | Panchase Forest Area |

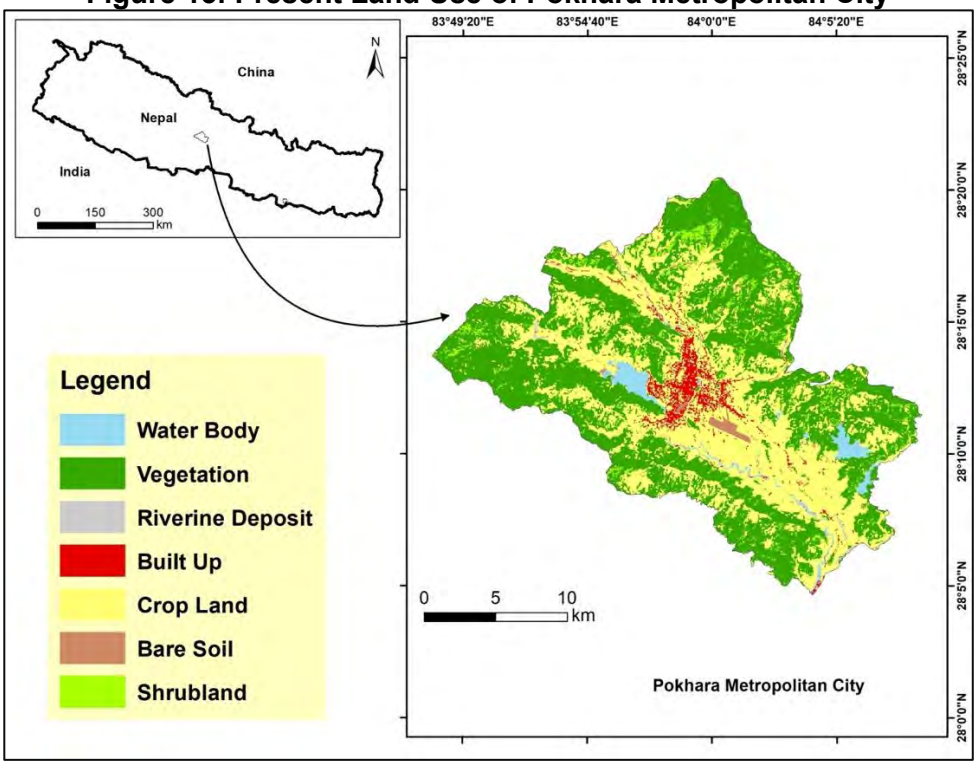
*Source: Topographic Map, Department of Survey, 2020*

**Table 10: Present Land Use of the Pokhara Metropolitan City**

| Land Use Type | Pokhara Metropolitan City | |
|---|---|---|
| | Area (sq.km) | Percentage |
| Water Body | 11.30 | 2.43 |
| Vegetation | 233.42 | 50.28 |
| Riverine Deposit | 1.73 | 0.37 |
| Built Up | 14.26 | 3.07 |
| Crop land | 176.83 | 38.09 |
| Bare Soil | 5.67 | 1.22 |
| Shrub land | 21.03 | 4.53 |

*Sources: Topographic Map, Department of Survey, 2020*

**Figure 15: Present Land Use of Pokhara Metropolitan City**




74. The general demographic information of the project area is presented below under different sub-headings.

75. **Demography.** As per the National Population and Housing Census 2021, the average population density of the Pokhara Metropolitan City is 1,106 per sq km. There are about 81.52 % of population are Hindu, 12.27% Buddhists, 2.48% Christians 6.24%, 2.11% Bon, 1.05% Muslim, and 0.56% with other religions in the project area local bodies. The population density of Pokhara Metropolitan is 1,106 person's square kilometers.

76. **Caste and Ethnicity. T**he project area local level has a multi-ethnic composition of different casts with Brahmin hills, Kshetri, Gurung, Magar, and Newa: (Newar) as the dominant ethnic groups. As per the National Population and Housing Census, 2021 of Nepal, the distribution of this ethnic composition in the Pokhara Metropolitan City is led by Brahmin hills (26.46%), followed by Gurung (14.95%), Kshetri (15.07%), Magar (10.27%), and remaining 28.56 % in other groups.

77. **Literacy rate and educational institutions.** The literacy of the Pokhara Metropolitan is 88.7% with male literacy rate at 94.2%, and female literacy rate at 83.7%. Noted educational institutions include Pokhara University, Prithvi Narayan Campus, Sainik Awasiya Mahavidhyalaye, Central College Pokhara, CTEVT Technical School Pokhara, Charak Institute of Health Science, Nepali Army School of EME Polytechnic and many other private as well as governmental educational institutes.

78. **Main sources of income.** The main occupations of the people in project area local level include Elementary Workers (30.3%), Skilled Agriculture, Forestry and Fishery Workers (17.7%), Managers (14.4%), service and sales workers (9.9%), Craft and related trades workers (9.3%), Professionals (6.6%), Plant and machine operators and assemblers (4.7%), technical and

associate professional (3.7%), Office assistance (2.7%) and armed forces (0.2%) (Nepal Housing and Population Census, 2021).

79. **Access to electricity.** All the wards of the project area local level have electrification network. Where, 99.53% of the households used electricity for lighting purposed and 0.26% of the household used electricity for the cooking purposes.

80. **Sources of drinking water.** Sources of water in the project area municipalities include Tap/piped water (within premises) (65.16%), Tap/piped water (outside premises) (14.72%), Jar/bottle (13.21), spout water (5.08%), Uncovered well/kuwa, Tube well/handpump (0.16%), and other (0.44%).

81. **Sanitation.** About 90.62% of the household in the project area local level used flush toilet (septic tank). Similarly, 7.67% of the households used Pit toilet, 1.27% household used flush toilet (Public sewerage), 0.24% of the household used public toilet whereas 0.20% household still without toilet facilities. Sewage from nearby homes, businesses, and industries are collected and treated by a wastewater network. These are owned and operated by Pokhara Metropolitan City also consist of a wastewater network that collects and treats sewage from households, businesses, and industries in the area. Households use on-site sanitation facilities like septic tanks, and discharge septic tank outflow and sullage into existing drains and open plots/areas in the Pokhara. Except during rains, drains mostly carry wastewater from town area.

82. **Solid Waste Management.** There is the arrangement of waste collection in Pokhara Sub-Metropolitan City. There are the tractors for the collection of waste with helpers and driver in each vehicle. Segregation at source is not in practice. Waste is collected daily in the urban areas (main road areas) while in the rest of the settlements; waste is collected once in a week. Hospital wastes are managed by the hospital themselves while the rest of the waste from supermarkets, health posts, commercial areas, hotels are collected by the municipalities. The waste collected in Pokhara Metropolitan City is relocated temporarily in the ward no. 32, Lameahal from the prior sanitary landfill in ward 14, Bacheuduwa. The effluent waste, health institutional waste and excreta collection and transportation are managed by public private partnership.

83. **Health centers.** The project area district consists of several hospitals, including Regional Hospital and others; Military Hospital, Manipal College and Teaching Hospital, Charak Memorial Hospital, Metrocity Hospital, Phewa City Hospital, Fishtail Hospital, Sahara Hospital and several nursing home, and policlinics. Currently, the sewage disposal system in the area relies on on-site sanitation, employing septic tanks and soak pits. However, this system has limitations. At the ward sub-health post, the prevalent illnesses reported are gastroenteritis and diarrhea, which can be attributed to factors such as inadequate water quality, the absence of proper surface drainage systems, and insufficient management of solid waste.

84. **Physical Cultural Resources and Tourism.** In the project direct impact area, there are no physical cultural resources (PCRs) that are listed as UNESCO World Heritage archaeological sites within the Pokhara Valley. However, there monuments under protection of Department of Archaeology. However, none of these are located within 1-2 km of the project alignments. The list of monuments found within Pokhara valley are listed in Table11 and Figure 16**.** Based on available online map sources and site visits, it has been observed that there are several socio-cultural and religious establishments, including temples, mosques, and educational institutes.

85. Pokhara's tranquil beauty has inspired numerous travelers. Its pristine air, snowy peaks serving as a spectacular backdrop, shimmering blue lakes, and lush green surroundings. With

the majestic Annapurna range as its backdrop and the serene Cluster of 9 Lakes, including the prominent Phewa, Rupa, and Begnas, Pokhara is an ideal destination for both domestic and international tourists. Situated in the Pokhara Valley, the gateway to the Annapurna region where many trekkers find their way, it is widely regarded as a 'must-visit' place in Nepal. The proposed Panchase road will connect the tourism center Panchase area, which is a natural greenery forest area enriched with biodiversity and ponds. The targeted Panchase area is a famous destination where yearly religious festivities are also organized and thousands of pilgrims from nearby districts visit the place. The road will connect to the village area various homestays established by the local Gurung communities.

**Table 11: List of Monuments around the Project Area within Pokhara Valley**

| S. N. | Name | Location and Coordinates | Monument Recognition / Project Components Distance | Image |
|---|---|---|---|---|
| 1 | Vindhyavasini Temple | Vindhyavasini Tole, PMC Latitude- 28.237723, Longitude- 83.984208 | National Archaeological Importance/the Airport-Phewa Road project is 4.45 km distance from the temple location. |  |
| 2 | Talbarahi Temple | Phewa Lake, PMC Latitude- 28.207377, Longitude- 83.953611 | National Archaeological Importance/ the Airport-Phewa Road project is 1.7 km distance from the temple location. |  |
| 3 | Bhimsen Temple | Bhairam Tole, PMC Latitude- 28.230804, Longitude- 83.984851 | National Archaeological Importance/ the Airport-Phewa Road project is 3.2 km distance from the temple location. |  |

| S. N. | Name | Location and Coordinates | Monument Recognition / Project Components Distance | Image |
|---|---|---|---|---|
| 4 | Shree Bhadrakali Temple | Bhadrakali, PMC Latitude- 28.212378, Longitude- 84.007262, | National Archaeological Importance/ the Airport-Phewa Road project is 2 km distance from the temple location. |  |
| 5 | Kaskikot Ancient Palace, Kaskikot | Kaskikot, PMC Latitude- 28.271974 Longitude- 83.904594 | National Archaeological Importance/ the Panchase Road project is 7 km distance from the ancient palace location. |  |
| 6 | Balaji Phachyan Temple | Panchase Peak, Modi Rural Municipality Latitude- 28.228869, Longitude- 83.797258 | Religious with Cultural Importance/ the Panchase road project is 1.85 km distance from the temple location. |  |
| 7 | Homekunda Temple (place for ritual of offerings to fire) | Panchase Pond, Modi Rural Municipality Latitude- 28.234357, Longitude- 83.787717 | Religious with Cultural Importance/ the Panchase road project is 2.95 km distance from the temple location. |  |

| S. N. | Name | Location and Coordinates | Monument Recognition / Project Components Distance | Image |
|---|---|---|---|---|
| 8 | Shiv Statue, | Pumdikot, PMC Latitude- 28.199638, Longitude- 83.929879 | Religious with Cultural Importance/ the Airport-Phewa Road project is 4.5 km distance from the temple location. |  |
| 9 | World Peace Pagoda | Chorepatan, PMC Latitude- 28.200884, Longitude- 83.944924, | Religious with Cultural Importance/ the Airport-Phewa Road project is …. km distance from the temple location. |  |
| 10 | Akaladevi Temple | Lamachour, PMC Latitude- 28.274776, Longitude- 83.955865, | Religious with Cultural Importance/ the Airport-Phewa Road project is 3 km distance from the temple location. |  |
| 11 | Narayan Temple | Nadipur, PMC Latitude- 28.230972, Longitude- 83.992760, | Religious with Cultural Importance/ the Airport-Phewa Road project is 3.5 km distance from the temple location. |  |

| S. N. | Name | Location and Coordinates | Monument Recognition / Project Components Distance | Image |
|---|---|---|---|---|
| 12 | Kedareshwor Temple | Lakeside,PMC Latitude-28.199991, Longitude-83.966320 | Religious with Cultural Importance/ the Airport-Phewa Road project is 400 m distance from the temple location. |  |
| 13 | Sitaladevi Mandir | Sitaladevi Tole, PMC Latitude-28.216812 Longitude-84.002553 | Religious with Cultural Importance/ the Airport-Phewa Road project is 3 km distance from the temple location. |  |
| 14 | Matepani Gumba | Matepani, PMC Latitude-28.216579, Longitude-84.007262 | Religious with Cultural Importance/ the Airport-Phewa Road project is 3.5 km distance from the temple location. |  |

| S. N. | Name | Location and Coordinates | Monument Recognition / Project Components Distance | Image |
|---|---|---|---|---|
| 15 | Kahun Kot Temple | Kahudanda, PMC Latitude- 28.237875, Longitude- 84.014783 | Religious with Cultural Importance/ the Airport-Phewa Road project is 12 km distance from the temple location. |  |
| 16 | Gupteshwor Mahadev Cave | Chorepatan, PMC Latitude- 28.237875, Longitude- 84.014783 | Religious with Cultural Importance/ the Airport-Phewa Road project is 1.5 km distance from the temple location. |  |

*Source: https://en.wikipedia.org/wiki/Department of Archaeology (Nepal)*

**Figure 16: Monuments around the Project Area within Pokhara Valley**


## E. Site Environmental Features

**Table 12: Site Environmental Features of Project Roads in Pokhara Metropolitan City**

| Subproject, Location and Environment Features | Site Photographs | |
|---|---|---|
| 1. **Damdame – Kudbi – Sidane – Bhanjyang Road (13 Km):** The proposed Panchase Road is located at the western hilly area of the Pokhara town. Road starts from Damdame which is connected by the newly blacktopped road being constructed by PMC. The proposed road will connect the tourism centre Panchase, which is a natural greenery protected area enriched with biodiversity and ponds. The targeted panchase area is a famous destination where yearly religious festivities are also organized and thousands of pilgrims from nearby districts visit the place. The route is a way to various homestays established by the local gurung communities and a cultural museum. The road alignment with width of 7-9 m is already opened and there will be no. impact to the Panchase forest area. The proposed proposal is for the upgradation work with blacktopped of 40 mm surface course of asphalt concrete, 100 mm of base course and 150 mm of sub base course. Hill/ side protection is needed in some sections. |  <br>*Existing Road Section at Damdame Ch.0+500* |  <br>*Existing Road in Panchase Forest Area at Ch.10+500* |
| |  <br>*Road sections at Kudbi Village Ch.1+500* |  <br>*Protection work needed nearby Damdame Road Section* |

<table>
<tr><th>Subproject, Location and Environment Features</th><th colspan="2">Site Photographs</th></tr>
<tr><td rowspan="2">2. International Airport – Lakeside Fast Track Road (8.8 Km): The road is located at the center of the Pokhara Valley starts from Lakeside. The existing road is passing through the settlement, there is no trees within the proposed road width, The road will be upgraded with blacktop of 40 mm surface course of asphalt concrete, 100 mm of base course and 150 mm of sub base course.</td><td>  <br>Existing road section at Radhakrishna Mandir Ch. 2+600</td><td>  <br>Road section near SOS Children Village at Ch.4+200</td></tr>
<tr><td>  <br>Road section at Indian Pension Camp Ch.5+200</td><td>  <br>Road section nearby International Airport at Ch.7+800</td></tr>
</table>

# V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

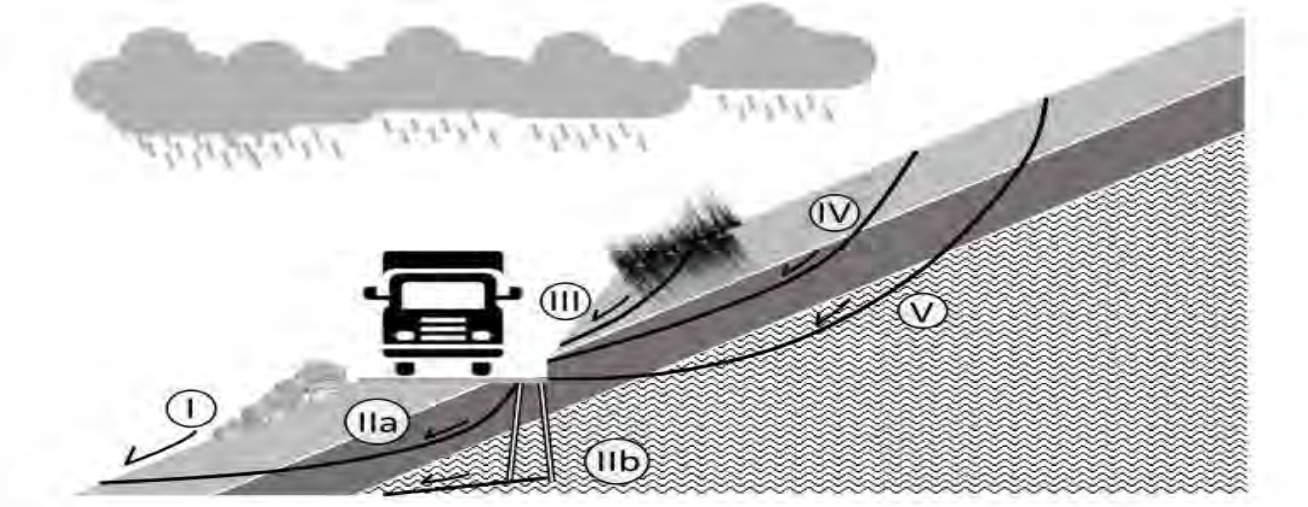
86. Environmental impact assessment is the systematic identification and evaluation of the potential impacts (effects) of proposed projects, plans, programs, or legislative actions relative to the physical, chemical, biological, cultural, and socioeconomic components of the total environment. ADB SPS (2009) requires the assessment of environmental impacts during the different stages of the project, including Project Planning and Design, Pre-Construction, Construction and Operation Phases and the formulation of corresponding mitigation measures to avoid, minimize or offset environmental impacts. All the project components taken up under Output 1 viz., Improvement to Roads and Drains at Pokhara Metropolitan City are evaluated for its environmental impacts and accordingly mitigation measures have been developed.

## A. Planning and Design Phase

87. **Design of the Proposed Components:** Technical design of all the components (roads, drains, footpath etc.,), will follow the relevant national planning and design guidelines. Road designs will comply with the applicable standards to meet the needs of the road users, keeping in view the road function, type and volume of traffic, potential traffic hazards and safety, capital cost, maintenance costs, vehicle operating costs, environment impacts, aesthetics as well as convenience of the road users. The principal geometric features for fulfilment of these objectives are road classification, the horizontal alignment, vertical alignment and the road cross-section. Roads will be designed with traffic control and safety measures commensurate with the traffic. These include road markings ensuring consistency, clarity, and sufficiency; facilities for pedestrians to cross are ensured by road markings; traffic signs (mandatory/regulatory signs, cautionary/warning signs and information signs); road delineators; lighting, etc.,

88. **Impacts from Landslides.** Landslides occur in soil or rock when the gravitational force on a hillslope exceeds the strength of the rock or soil. Most often this occurs in areas with steep slopes, during or following heavy rainfall or snowmelt, and from shaking due to earthquakes. The road alignments for both the project components are finalized. And, both the road alignments do not require any cutting or filling to be done. However, as per study conducted BG McAdoo et.al, on road network in Nepal, the Panchase Road is located in areas that are subjected to landslides. In Nepal, there are five primary modes of potentially damaging mass movements caused by informed road construction. These include – (I) debris flows from excavated material stored on the downslope side of the road; (II) deeper seated landslides that are accommodated by poor road drainage as water seepage can aid failures that include regolith (IIa), and freeze-thaw in joints that can result in bedrock failures (IIb); (III) shallow failures close to the road caused by over-steepened road cuts that may be mitigated by planting; (IV) shallow landslides caused by oversteepening that include potentially stabilizing roots from vegetation; (V) deeper seated failures triggered by oversteepening by road cuts that may be include bedrock. The figure below shows these primary modes of landslides in Nepal.

**Figure 17: Primary Modes of Landslides in Nepal**




Source: BG McAdoo et. al, "Roads and Landslides in Nepal: How development affects environmental risk", Nat. Hazards Earth Syst. Sci., 18, 3203–3210, 2018

89. To address these impacts, the detailed design shall consider the following:

(i) Recognition and investigation of unstable areas should be performed;
(ii) Upon identifying the possible landslide locations, design of an appropriate preventive measure should be determined for each of these locations. These could be any or a combination of the following viz., improving drainage, reducing the angle of the slope, excavating to unload the top of the slope and /or building a protective berm or wall to buttress the bottom of the slope;
(iii) Additional construction measures such as building retaining walls, soil nailing, ground anchor walls and use of horizontal drains can be explored, as well.
(iv) All the landslide prevention measures should be incorporated in the Final Design.

90. **Impacts to local hydrology.** Water logging during rainy season is a common feature in one of the project areas viz., the Airport to Lakeside Link Road. This has been corroborated during discussions with the local community. The waterlogging of the roads is often attributed to poor drainage system resulting from failure to consider the local hydrology in the planning and design phase. Also, appropriate drainage for hilly roads, such as Panchase Road, is one of the key measures to be utilized to prevent landslides. To address these impacts, the detailed design will consider the following:

(i) Detailed assessment of the micro hydrology and topography of the project sites;
(ii) Design the roads according to the slope and elevation relative to the water bodies that may exist in the area; and
(iii) Provide the appropriate design of drains for road stretches that do not have existing drainage or where persistent flooding has been recorded.

91. **Damage / Disturbance to physical cultural resources.** Damage to physical cultural resources such as the sacred Peepal Trees (*Ficus religiosa*) will be avoided. Proposed works will be confined to existing road right of ways (ROW). A couple of the sacred Peepal trees are located along the Airport to Lakeside Link Road. Damage to these sacred trees will be avoided

by altering the road / drain designs locally. No other impact to common property resources or PCRs envisaged. However, construction phase disturbances like safety risk, access, noise and dust will need to be managed properly.

92. The following mitigation measures shall be implemented to address the above impacts:

(i) Conduct investigation during detailed design at site to confirm if any existing common properties/structures will be disturbed due to the road alignment;
(ii) Conduct further meaningful consultation with stakeholders during detailed design;
(iii) Ensure that all works will be confined within existing road and side drains alignments, and within existing ROWs;
(iv) avoid disturbance or damage of PCRs through proper design of road alignments and demarcating construction area; and
(v) ensure the implementation of construction phase EMP to avoid disturbance / damage to common properties and PCRs.

**Chance finds**. Although Pokhra is not an archaeologically sensitive area, chances of finding items of archaeological importance cannot be ruled out. Accordingly, the Contractor, as a precautionary approach, will be required to implement the following measures in the event of a chance finds:

(i) Strictly follow the protocol by coordinating immediately with PIU and Nepal Department of Archaeology for any suspicion of chance finds during excavation works;
(ii) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(iii) Stop work immediately to allow further investigation if any finds are suspected; and
(iv) Inform the Department of Archaeology (DOA) if a find is suspected and take any action they require to ensure its removal or protection in situ
(v) Follow the written instructions of DOA for continuation of works.

93. **Impact to Local Vegetation and Trees:** It is noted that the improvements to the Panchase Road will not impact the local biological environment including trees, birds and any other animals. However, the Airport – Lakeside Link Road improvements will impact certain sacred Peepal (*Ficus religiosa*) trees. The impacts on these trees will be avoided by altering the road / drain alignments locally. The following mitigation measures will be adopted:

(i) Conduct investigation along the proposed road alignment with final design to confirm the number and type (species) of tree species that will be impacted;
(ii) Identify the trees that plays a beneficial role in the local environment i.e., those trees that house bird nests or whose foliage is used by animals etc.
(iii) Conduct meaningful consultation with stakeholders to determine the trees that would need to be protected;
(iv) consider alternative and innovative road alignments to avoid tree cutting and where tree cutting is unavoidable, appropriate compensatory afforestation measures should be implemented; and
(v) Do not cut protected trees, retain the tree / alter the alignment/layout of road/drain locally to preserve the trees;
(vi) obtain any necessary approval from appropriate agencies such as Forest Department, to implement the Tree Conservation measures for the subproject.

(vii) Conduct survey of trees for bird nests prior to cutting; if any active nests, ensure that trees are not disturbed until young birds fly away from the nests; do not cut trees during the breeding season.

## B. Pre-Construction Phase Impact and Mitigation Measures

94. **Consents, Permits and Clearances.** The subproject would require Environmental Clearance from the Line Agency viz., MoUD, GoN. Environmental clearance for the entire Project shall be obtained by the PCU from the MoUD. Failure to obtain necessary consents, permits, and other appropriate regulatory clearances can result in design revisions and work stoppage. All the necessary consents, permits, and clearances shall be obtained before the start of civil works.

95. **Integration of EMP in bidding documents and contracts.** Lack of awareness by contractors on ADB SPS requirements may result in insufficient budget and non-implementation of Environmental Management Plan (EMP). To ensure that EMP will be provided with sufficient budget and implemented:

96. The PCU will incorporate the costs of implementing OHS and the EMP as well as specific provisions requiring contractors to comply with all other conditions required by ADB into the bidding and contract document.

97. Once the Contractor is selected, the PIU with support from PMCDC will inform contractors on their responsibilities in EMP implementation, in compliance with ADB and government requirements, self -monitoring and reporting procedures.

98. **EMP Implementation Training.** If the contractors and construction supervision engineers are not aware about the requirements of this EMP, the project may not proceed and comply with ADB and GoN environmental policies. The PCU, PIU and contractors will be required to undergo training on EMP implementation. The capacity building program will be participatory to the extent possible to make it more effective, with learning by doing, role playing, group exercises, on-the-job training, etc. Pre- and post-training assessment will be conducted to measure the effectiveness of the program.

99. **Updating of IEE.** The PCU shall update the IEE in case of change in design/based on the final detailed design and submit the same for review and clearance of ADB.

100. **Community awareness on project activities and impacts.** Lack of community awareness on project activities may result in potential community health and safety concerns and complaints. Before the start of project construction, a meaningful consultation with the affected communities will be conducted. This meaningful consultation will aim to engage community stakeholders, listen to their views, and arrive at a common understanding on the ways to implement the project. To aid in the consultation process, it is important that the community should be made aware of the details of project activities. Important information to be disseminated to the people are, among others, the following:

(i) Overview and objectives of the proposed project;
(ii) Preliminary and/or final detailed design of proposed project components;
(iii) Potential environmental and social impacts (positive and negative) of the project, and the proposed mitigation measures for the perceived negative impacts; and
(iv) Grievance redress mechanism and contact details of the project.

## C. Construction Phase Impact and Mitigation Measures

101. The construction phase involves site preparation, transportation of materials, equipment and labor to the site and carrying out the required construction activities while adhering to the EMP.

102. **Construction Planning.** It has been observed that inadequate planning could lead to non-implementation of EMP during the construction phase and result in significant environmental impacts leading to non-compliance with ADB's environmental safeguard requirements. To ensure that EMP will be implemented during the construction phase, the contractor should, prior to start of construction activities undertake the following:

(i) Appoint an Environmental Health and Safety (EHS) Supervisor;
(ii) Develop a Site-Specific Environmental Management Plan (SEMP) and get it approved from the Client;
(iii) Conduct training on the rationale for and implementation of the SEMP and EMP to enhance general understanding and clarify responsibilities regarding implementation, including monitoring and reporting, must also be provided to all relevant staff of contractors;

103. While the locations of the two project components have been finalized, the locations for labour campsites, batching plant site etc. that would be required by the Contractor temporarily during the construction period, have not been finalized. The Contractor should select the locations for the campsites, batching plant sites etc. in consultation with Pokhara Metropolitan City and get it approved from the PCU and PIU. The Contractor should provide all infrastructure and services necessary to ensure that the labourers' needs are addressed throughout their stay at the campsites. Also, the Contractor should deploy construction equipment, plant and machinery in good condition, provided with necessary pollution control apparatus, and operate as per standards and meet all environmental standards specified by the GoN for such operations; Contractor shall ensure necessary fitness, pollution under control certificates, and are operated by qualified / licensed drivers/operators.

104. The Contractor will be required to submit to PCU, for review and approval, a SEMP including (a) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes, (b) specific mitigation measures following the approved EMP; (c) monitoring program as per EMP; and (d) budget for SEMP implementation. No works can commence prior to approval of SEMP. The SEMP will include the following, among others:

(i) Construction Compound Management Plan;
(ii) Construction Health and Safety Plan (including COVID-19 H&S guidance);
(iii) Emergency Incident Response Plan.

105. **Site selection of sources of materials**. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be assessed by PIU. Priority would be sites already permitted by Department of Mines and Geology (DOMG) of Nepal. If new sites are necessary, these would be located away from population centres, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas. It will be the construction contractor's responsibility to verify the suitability

of all material sources and to obtain the approvals of DOMG and from.the local revenue administration. If additional quarries are required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites, with written approval of PCU/PIU. The contractor will identify sources of water for construction purposes and obtain necessary permissions as required, and approval of PIU before the use. Details of material sources and water sources will be provided in SEMP. The construction contractor will be required to:

(i) Reuse the excavated soils and road material as much as possible in the construction, and minimize the need for new material.
(ii) Use material sources permitted by government(DOMG)
(iii) Avoid creation of new borrow areas as much as possible, in unavoidable cases, obtain all permissions and clearances, including conduct of environmental assessment studies and obtaining environmental clearances
(iv) Ensure that borrow areas are not located in environmentally sensitive areas,
(v) Prepare borrow area management plan and implement
(vi) Verify suitability of all material sources and obtain approval of PIU;
(vii) Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site does not cause impact on health and safety of the workers and the community; and
(viii) Submit to PIU on a monthly basis documentation of sources of materials. . If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party, contractor will ensure that all the parties/ suppliers necessary clearances and permission as per the Nepal law and will provide the documentary evidence to PIU/consultants.

106. **Disruption of Existing Utilities**. Along the Airport to Lakeside Link Road, where the road improvements are being taken up in the Pokhara Metropolitan City, utilities such as electric poles, water lines, drains etc. are present. Construction activities may disrupt the existing utilities installed. To avoid/minimize or manage the disruption of existing utilities, the following measures will be implemented:

(i) conduct investigation at site to determine all the existing utilities that are likely to be disturbed during construction phase;
(ii) all underground utilities should be marked prior to any construction works to be taken up at the locations; and
(iii) coordinate with agencies responsible for the maintenance of the utilities and formulate a plan to minimize disruption of services during construction phase. The plan must be formulated in coordination with PCU and stakeholders at the site. Where required, the responsible agency shall be requested by PIU to carry out the necessary works at the time required and at cost of the subproject. For essential supplies like water supply, any disruption more than 24 hours, shall be minimized by providing alternative water supply, e.g., via mobile tankers.

107. **Excavation Works.** Excavations are inevitable considering that the Pokhara Subproject involves improving the drainage network along the Airport to Lakeside Link Road in the Pokhara Metropolitan City. Along the Phanchase Road, a clear width road alignment has been recently completed. Hence, not much of excavation works are expected on the Panchase Road. Excavations may affect local drainage patterns if surface and groundwater collect in voids as they are being dug. Further, it may cause safety issues for the local community using the road alignments for their daily commute. To mitigate, the contractor will ensure the following:

(i) All excavations shall be done to the minimum dimension as required for safety and working facility;
(ii) Excavations should be carried out after identifying the location of all utilities that exist along the project area;
(iii) The excavation shall be executed in such manner, that the contractor does not damage or interfere with existing services or structures. If damage or interference is so caused, the contractor shall make arrangements with the supply and/or building owner to execute the repairs at the contractor's own cost;
(iv) Explore working in off-peak hours or night on busy road sections with prior permission and with proper lighting and safety measures; however, no noisy works shall be conducted in the night;
(v) Road drains and channels shall be kept free from obstructions at all times;
(vi) Excavated areas should be sufficiently demarcated so as not to affect the health and safety of workers and the people using the road alignment for their daily activities.

108. **Excavated Earth Management:** Excavation during construction will generate loose soil which can be carried through surface run-off during a rainfall. During construction phase, the Contractor shall implement the measures at all times to control soil erosion that shall include, but not be limited to the following:

(i) The Contractor shall plan the works in a way that minimizes surface excavation works during the rainy season, where practicable.
(ii) Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms shall be developed by the Contractor.
(iii) The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered.
(iv) Channels, earth bunds, netting, tarpaulin and or sandbag barriers shall be used on site to manage surface water runoff and minimize erosion.
(v) The overall slope of the works areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows.
(vi) Monitor water quality that could exist close to the working areas to ensure compliance.

109. **Impact on Air Quality.** Air quality is impacted at the construction sites because of vehicle movements, operations of construction equipment, generator sets etc. and generation of dust. Dust and gaseous emissions will be generated by the construction machinery. Construction work also involves breaking up, digging, transporting, and dumping large quantities of dry material. The particulate matter from these can cause health impacts, i.e., respiratory problems, irritation in eyes and reduction in visibility. Further, the Panchase Road is adjacent to forest areas with significant presence of wildlife and impact on air quality can cause a deleterious impact on the local ecosystem, as well. During the construction period, the Contractor shall implement the following mitigation measures:

(i) Take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards;
(ii) Fit all heavy equipment and machinery with air pollution control devices that are operating correctly;
(iii) Construction vehicles must travel at speeds that minimizes dust generation;
(iv) Reduce dust by spraying water on stockpiled soil, excavated materials, and spoils;

(v) Cover with tarpaulin vehicles transporting soil and sand;
(vi) Cover stockpiled construction materials with tarpaulin or plastic sheets;
(vii) Water spraying to access roads, camp sites and work sites to reduce dust emissions;
(viii) Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications;
(ix) All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant standards;
(x) Repair and maintain access roads, as necessary.
(xi) prohibit burning firewood in work and labor camps (promote liquified petroleum gas for cooking purposes and electric heater for heating purposes;
(xii) use vehicles that have government-issued permits and registrations; and
(xiii) prohibit open burning of solid waste;
(xiv) Monitor air quality according to the environmental monitoring plan.

110. **Noise.** Noise-emitting construction activities include earthworks, road cutting, concrete mixing, concrete formation works, movement and operation of construction vehicles and equipment, and loading and unloading of coarse aggregates, among others. The Airport – Lakeside Link Road is located in residential and commercial neighborhoods; while the Panchase Road traverses through sparsely populated hilly regions. Additionally, the Panchase Road is adjacent to forest areas with significant presence of wildlife and sensitive receptors. Additionally, the onsite workers are also exposed to noise levels that may be higher than the permitted levels due to their proximity to the noise sources. The significance of noise impact will be higher at the immediate vicinity of the subproject site where sensitive receptors are situated. Mitigation measures to reduce the noise impacts off-site at the nearest sensitive receptors include the following:

(i) Arrive at the construction schedule upon discussions with the nearby stakeholders, especially when works are carried out near sensitive receptors such as hospitals, schools, places of worship etc.;
(ii) Install noise barriers between the source and receptor, where necessary;
(iii) Enclose and locate generators away from sensitive receptors;
(iv) Operate construction machines / conduct noise operations sequentially rather than all together;
(v) spread out the schedule of material, spoil and waste transport;
(vi) minimize drop heights when loading and unloading coarse aggregates;
(vii) avoid use of horns unless absolutely necessary;
(viii) Select electrically powered plant that is quieter than diesel or petrol-driven plant, if interchangeable;
(ix) Use modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions, and ensure they are maintained to manufacturers' specifications;
(x) Noise-generating equipment must be fitted with silencers;
(xi) Optimize the use of noisy construction equipment and turn off any equipment if not in use;
(xii) Regular maintenance of all equipment and vehicles;
(xiii) Stop all construction activities during at night;
(xiv) Implement a complaint handling system;
(xv) Workers should be provided with Ear muffs / protective hearing equipment in noise critical areas;

(xvi) Place visually clear instructions in areas where noise levels are significant;
(xvii) Measure noise levels periodically as per the Environmental Monitoring Plan.

111. **Impact on Surface Water Quality:** During project implementation, the Contractor shall be setting campsites, material storage areas and vehicle washing areas. Silt-laden run-off from stockpiled materials, solid wastes and domestic wastewater from the construction camp, and leaks from chemical storage areas and machineries may contaminate or result in water pollution if disposed or discharged to nearby receiving bodies of water. Solvents and vehicle maintenance fluid (oil, coolant) and diesel fuel may contaminate surface and groundwater if these are spilled on the ground, disposed of directly into the ground or washed into the streams. Human waste from construction workers may also contaminate surface water and groundwater if there are no adequate sanitary facilities. The mitigation measures to prevent the impact on surface water quality is very critical during the Panchase Road construction as the streams and springs are the drinking water sources for a number of hill communities, as well. To mitigate these impacts, the contractor will be required to:

(i) Provision of temporary sedimentation canal and/or silt traps along construction areas, particularly alignments that are adjacent to receiving bodies of water or canals;
(ii) The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the PMCDC to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work;
(iii) All temporary discharge points shall be located, designed and constructed in a manner that will minimize erosion in the receiving channels;
(iv) Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer;
(v) Use surplus soil for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas;
(vi) Avoid scheduling of excavation work during the monsoon season;
(vii) Confine construction area including the material storage (sand and aggregate) so that runoff will not enter the site;
(viii) Ensure that drains are not blocked with excavated soil or other materials;
(ix) Stockyards at least 50 meters (m) away from watercourses;
(x) Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110%;
(xi) Effective maintenance of machinery and vehicles to avoid leakages;
(xii) For effluents from workplace, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs; provide proper systems for collection, treatment and safe disposal of wastewater from construction camps and facilities; no pit latrines shall be allowed; toilets. And wastewater outlets shall be connected to city sewerage systems (if available) or septic tanks and soak pit systems developed within the site. Septic tanks should be sealed from bottom and sides to prevent seepage.
(xiii) Solid waste management, as detailed in the approved SEMP, should be implemented throughout the construction period;
(xiv) Monitor water quality according to the environmental monitoring plan.

112. **Impact on Groundwater** During the construction period, there is an increased demand for groundwater arising from water required for various civil works and for personal consumption by the workers. The Contractor will be required to source the groundwater from approved sources so as to avoid impact on availability of the water to the local community, in particular, when the local community are dependent on the same aquifer. This is true in particular during construction of Panchase Road as the springs and streams are utilized by the downhill communities for drinking. Additionally, material storage areas, equipment and vehicle maintenance areas, solid waste disposal and the like, if not managed effectively, can result in the contamination of the groundwater. Mitigation measures will include:

(i) Use the groundwater resources judiciously with prior approval from competent authority;
(ii) All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned;
(iii) Storage of lubricants and fuel at least 50 m from water bodies and in double-hulled tanks;
(iv) Effective maintenance of machinery and vehicles to avoid leakages;
(v) Effective management of solid waste and construction debris as per an approved SEMP;
(vi) Provide uncontaminated water for dust suppression.

113. **Drainage Management.** Construction material getting into surface run off or uncontrolled disposal may cause drainage congestion. The impact of these on hydrology is expected to be more pronounced during post monsoon period with rapid movement of rainwater through existing drainage structures, which if blocked by construction waste and debris may cause flooding or waterlogging in neighboring areas. And, if these occur during Panchase Road construction, the downhill areas would be impacted severely. Hence, the following mitigation measures should be adopted by the Contractor:

(i) The contractor shall adopt a site clearance procedure; dispose debris / waste soil only in designated and pre-approved locations by the PIU;
(ii) Wastes and construction debris will not be disposed in a manner that these would end up in drainage canals.
(iii) The on-site storage of excessive quantities of unwanted spoil and aggregate materials should be avoided. Where storage is necessary, the Contractor shall ensure heaps and stockpiles are located at sites that they do not permit direct runoff into watercourses and are on land sloping at less than 1.5%.
(iv) All heaps shall be of a size and stability that will ensure the risk of mass movement during period of heavy rainfall is minimized.

114. **Construction Wastes Management.** Solid wastes will include construction wastes (solid wastes: piece of rods, woods, bricks, stones, containers, electric wire, pipes etc. liquid waste: paint, bitumen, oil etc.) and general wastes (solid wastes: papers, plastic containers, residues of food, fruits etc. and liquid waste: from kitchen and bathroom etc.). These wastes will be generated due to construction camps, construction activities and materials used for construction. Inadequate management of construction wastes will result in negative impact on the soil, surface water, groundwater, aesthetic beauty of area and workers' health and safety. To mitigate the impacts, the contractor will implement the following to manage wastes:

(i) Prepare Construction Waste Management Plan as par the SEMP;

(ii) Identify and seek approval for the areas where construction waste could be disposed;
(iii) The contractors should take every opportunity to reduce the amounts of waste generated and collect recyclable material for processing by local operators.
(iv) Contractor shall implement waste segregation on site.
(v) Receptacles for solid waste should be provided for the use of workers, and their contents should be disposed properly;
(vi) Clean construction waste such as excess soil or rubble should be used in landscaping on site or given to landowners and developers seeking fill material.
(vii) Waste auditing. The contractor will record the quantity in tons and types of waste and materials leaving site during the construction phase;
(viii) Waste fuels/oils may be generated from equipment used on-site during construction and may be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by relevant parties;
(ix) All construction waste should be managed as per the approved SEMP.

115. **Impact on Trees and Vegetation:** A preliminary survey along the two road alignments indicated that no tree will be impacted from the project on Panchase Road. A few Peepal (Ficus religiosa) trees located at the edge of the ROW along the Airport to Lakeside Link Road will be impacted. However, these will be protected by altering road / drain alignments locally. In the event the final designs reveal impact on trees, the following mitigation measures shall be implemented:

(i) The first priority is to avoid cutting of trees through changes in design and road alignments. This is in particular important when the tree species is protected or considered sacred by the community and / or houses nests for birds;
(ii) Do not cut any protected tree species; retain the tree / alter the alignment / layout of road/ drain locally to preserve the trees;
(iii) after the finalization of the designs and layout of the project components, the trees within proposed construction areas will be marked;
(iv) trees within area required for construction will be felled after prior approval;
(v) replacement of the tree shall be undertaken by the project i.e., PIU at the replacement ratio of ten trees for every tree that is cut (i.e., 1:10 ratio as per Forest Regulations[13],2022) Indigenous/native species will be preferred in tree planting;
(vi) only trees that will require removal within the proposed construction areas of the sites will be cut;
(vii) For trees that will not be cut, take all precautions to protect them from any damage from construction activities
(viii) Conduct survey of trees for bird nests prior to cutting; if any active nests, ensure that trees are not disturbed until young birds fly away from the nests; do not cut trees during the breeding season.

116. **Impacts on aquatic ecology.** The Panchase Road project alignment is close to a number of local surface water bodies. The construction of the subproject may affect these water bodies due to siltation and chemical spills, possible landslides and improper waste disposal, and therefore may impact the quality of the water and any thriving aquatic species. To mitigate this impact, contractor will be required to:

[13] Forest Regulations 2022-Rule 93 (5), loss of 1 tree should be compensated by planting 10 trees and Rule 93 (5), the amount must include bi-annual production or purchase of trees, trees transportation, afforestation of 1600 trees per hectare, fencing and boundary for the protection of trees and require number of people for look after.

(i) Take all measures to mitigate the occurrence of landslides;
(ii) Provide temporary protection at sections near the ponds to avoid sliding of soils;
(iii) Store spoils away from the side of the river/pond;
(iv) Implement proper storage/disposal of materials, chemicals and waste
(v) Implement mitigation measures for excavation, soil erosion and sediment mobilization, surface water pollution, and construction waste generation;
(vi) Conduct sampling and analysis of the surface water near to the construction sites as part of the Environmental Monitoring Plan.

117. **Impacts on Ramsar Wetland.** The distance of the Phewa Lake, which is part of the Ramsar Site viz., Lake Cluster of Pokhara Valley, is 13.5 km from the lower reach of the Harpan Khola (a stream near Panchase Road) and to the last point of the Airport to Phewa Lakeside Link Road about 500 m. Although lake is not located in close proximity, entry of silt laden or contaminated surface runoff during the rains, or wastewater from the construction work sites or facilities if discharged improperly may enter the lake area. The impact on the biodiversity could occur because of the practices at the construction campsites, actions on workers / employees like poaching of animals etc. Wetlands are among the most biologically productive ecosystems. The biological environment of a wetland is dependent on the physical environment and thus vary widely according to climate, physiography, and soils or other substrate features. But, regardless of other variations in physical conditions, wetlands occur because there is water present on a permanent or reliably recurring basis above or within the surface soils, and it is the presence or absence of this water that exerts the greatest single influence on wetland ecology. Hence, altering the hydrologic regime, increase in sediment load, inflow of contaminated waters and even any smallest change in these parameters, would play a significant influence of the wetland ecosystem. Following measures shall be implemented:

(i) Ensure that no construction camp or facility is located within 1 km of the Pahwa Lake
(ii) Ensure provision of proper sanitation and wastewater collection and treatment systems, including on site treatment facilities such as septic tank and soak pits
(iii) Maintain the workers camp sites and work sites cleanly, and ensure that there is no solid waste disposal or open defecation; create awareness among the workers and staff and ensure and enforce strict site rules
(iv) Implement measures suggested in drainage and surface water quality to ensure that no silt laden runoff is either not generated or contained within the site if generated and measures to manage spillage of oils, chemicals, fuels etc., is managed.
(v) Build awareness amongst the workers to prevent any impact on the protected areas and key biodiversity arising from their actions during the construction period;
(vi) prevent workers from removing / damaging any flora and fauna found in the project area;
(vii) Contractor should ensure that a "no Poaching or fishing policy" is implemented throughout the construction period to cover on-site and off-site activities
(viii) Contractor should ensure that a "No vegetation / tree damage policy" is implemented throughout the construction period to cover on-site and off-site activities;
(ix) Emergency response plan must be prepared for any incident that can lead to any deleterious impact on the protected areas and key biodiversity areas.

118. **Impact on Traffic.** Improvements to the road alignments in Pokhra will impact the regular traffic movements during the construction period. This can create traffic congestion and

disturbance to pedestrians and motorists in the vicinity of the affected area if not properly managed. Construction activities in the are in residential areas where the local community need to have access to their properties. However, public access along these road alignments may be disrupted during construction activities. Pokhra is a tourist place and the general tourist season is during March to May and September to November every year. Works on Panchase road may affect the tourist movement. Works near tourist activities may disturb / inconvenience the tourists and may also pose safety risks. Mitigation measures to ensure safe access shall be implemented by the contractor. A generic Traffic Management Plan can be presented in the SEMP which can be updated in consultation with the local stakeholders to incorporate the site-specific needs at each site. The Contractor should carry out the following activities as part of the mitigation measures:

(i) Schedule road works in consultation with tourism authorities and traffic police; works that may affect the tourist places shall not be conducted during the tourist seasons
(ii) Complete the works and clear the sites prior to start of peak tourist seasons;
(iii) Plan roads and drain works minimizing traffic disturbance/blockades; work planning is crucial to minimize the inconvenience to public due to road works; provide diversions / alternative roads where required
(iv) A Site-Specific Traffic Management Plan should be drawn up in consultation with the local community on construction operations and work schedules.;
(v) Coordinate with traffic police for temporary road diversions and for provision of traffic aids;
(vi) Notify public and provide sign boards informing nature and duration of construction works and contact numbers for concerns/complaints;
(vii) Maintain sufficient access to houses and shopkeepers (commercial establishments) during works; provide proper and safe pedestrian access.
(viii) Awareness should be built amongst the community on the implementation of the Site-Specific Traffic Management Plan;
(ix) Emergency response plan must be prepared for any traffic accident during construction and should be included in the SEMP.
(x) As necessary, increase workforce for speedy completion;
(xi) Schedule material deliveries on low pedestrian traffic hours;
(xii) Restore damaged properties and utilities;
(xiii) Erect and maintain barricades if required;
(xiv) Pedestrian access will be maintained with the use of walking boards. Wheelchair and disabled access shall be maintained.
(xv) Surfaced roads shall be subject to road cleaning and unsurfaced roads to dust suppression, the methodology and frequency of which shall be included in the SEMP.

119. **Disruption of Public Access.** Majority of the construction activities for the International Airport to Lakeside Fast Track Road Subproject in the Pokhara Metropolitan City, are in residential areas where the local community need to have access to their properties. However, public access along these road alignments may be disrupted during construction activities. Mitigation measures to ensure safe access shall be implemented by the contractor. Among which are the following:

(i) Prior coordination with the surrounding community on operation and work schedules.
(ii) As necessary, increase workforce for speedy completion;

(iii) Inform through display board about nature, duration of construction and contact for complaints;
(iv) Schedule material deliveries on low pedestrian traffic hours;
(v) Restore damaged properties and utilities;
(vi) Erect and maintain barricades if required;
(vii) Pedestrian access will be maintained with the use of walking boards. Wheelchair and disabled access shall be maintained.
(viii) Surfaced roads shall be subject to road cleaning and unsurfaced roads to dust suppression, the methodology and frequency of which shall be included in the SEMP.

120. **Impacts on Physical Cultural Resources (PCR) and chance finds.** There are no known / notified Physical Cultural Resources (PCR) in the subproject areas. However, the Contractor, as a precautionary approach, will be required to implement the following measures in the event of chance finds:

(i) Strictly follow the protocol by coordinating immediately with PIU and Nepal Department of Archaeology (NDA) for any suspicion of chance finds during excavation works;
(ii) Stop work immediately to allow further investigation if any finds are suspected; and
(iii) Obtain approval for the construction work from the NDA prior to commencing the work on the stretch;
(iv) Carryout construction as per the terms and conditions set out in the approval;
(v) Request authorized person from the NDA to observe when excavation resumes for the identification of the potential chance finds and comply with further instructions.

121. **Impacts on socio-economic activities.** The subproject components especially the Airport to Lakeside Link Road in the Pokhara Metropolitan City is located in residential areas with significant economic activities taking place on a daily basis. On the other hand, the Panchase Road subproject, shall create restrictions for the people's movement to places of economic activities and to their agricultural farmlands. The impacts that will result from construction works including excavation, stockpiling, construction equipment and vehicle operation and accidental damage to utilities are significant, but temporary. The potential impacts include disturbance to economic activities, particularly to the businesses operating along the alignments of construction works. Contractor will be required to:

(i) Develop the construction schedule in discussions with the community so that movement of construction vehicles can be avoided during school travel timings, festival times and /or any other local events that would require local communities to travel;
(ii) Implement the traffic management plan in collaboration with local authorities;
(iii) Where traffic congestion will likely occur, place traffic flagmen during working hours;
(iv) Avoid full road closures by applying the construction method on section-wise and/or chainage-wise approach during excavation, concreting and/or curing periods;
(v) If full road closure is not possible, especially on very narrow roads, ensure that alternate routes are identified and that affected residents and establishments are informed prior to conducting the construction activities;

(vi) Provide convenient access to pedestrians when works occur in front of residential, commercial or institutional establishments. Examples are planks with handrails that should be provided to cross excavated areas.
(vii) At all points of time, ensure that the local communities have, at a minimum, access to their households;
(viii) Manage stockpile;
(ix) Manage pumped water from excavations either to drains or drums for later use;
(x) Relocate the affected power supply poles, and
(xi) Advise the concerned authority during accidental damage to utilities.

122. **Occupational health and safety risks.** Safety risks and health issues arise from storage, handling and transport of hazardous construction material. Construction workers are also at risk of accidents due to moving vehicles, and other construction related activities. Workers are also exposed to high level of pollution from dust, exhaust of vehicles and machinery and noise exposed to pathogens contained in wastewater and untreated sewage and septic tank effluents flowing through the roadside drains. Further, if workers do not keep to regulated working hours, the risk of accident events will be higher due to fatigue. Insufficient supply and improper use of personal protective equipment (PPE) and lack of safety procedures may cause injuries or fatal accidents. Spread of COVID-19 is also a risk to manage among workers. It is expected that, at peak time there will be 30-40 workers at a time on each site, which can easily trigger COVID-19 human transfers. There is also a risk of transmitting COVID-19 to the residents. The contractor will be required to implement the following measures:

(i) All relevant provisions of the National Health Care Waste Management Standards and Operating Procedure14-2020 and relevant WHO guidelines will be adhered to, concerning the provision of adequate measures to avoid contracting and/or spreading diseases during construction phase;
(ii) Follow international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities; and EHS Guidelines on Waste Management Facilities15. These practices include recommended measures to prevent, minimize and control pathogens from inflicting workers through training and use of appropriate PPEs, clothing and equipment when working along the drainage system, and immunization and health monitoring (e.g. hepatitis B and tetanus).
(iii) Existing drains may present hazardous working conditions in some places due to lack of oxygen and flammable nature of methane emissions which will be detrimental to the health and safety of workers. Put in place standard operating procedures with appropriate equipment, and workers are provided with necessary training and personnel protection equipment to safeguard health and safety
(iv) Follow established occupational health and safety protocol on emerging infectious diseases such as the corona virus disease (COVID19). See **Appendix 1** for a sample guidance note in responding to COVID-19;
(v) A readily available first aid unit, including an adequate supply of sterilized dressing material and appliances, will be provided as per the factory rules. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital;

[14] National Health Care Waste Management Standards and Operating Procedures-2020-Document developed based on the “Health Care Waste Management Guideline 2014”, “The Public Health Service Act, 2018, Public Health Service Regulation 2020 and National Health Policy, 2019.
[15] IFC World Bank Group. 2007. Environmental, Health and Safety (EHS) Guidelines – General EHS Guidelines: Environmental – Noise Management.

(vi) Other first aid medical equipment and nursing staff will be made available or arranged on-call;
(vii) The contractor will, at his own expense, conform to all disease prevention instructions as may be given by PCU/PIU;
(viii) Provide regular health check-ups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce;
(ix) The contractor shall provide at cost all labor and materials and construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications and provide personal protective equipment (PPE) to all the laborers working at the construction site;
(x) Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards;
(xi) Make available first aid kits, ambulance facilities, and fire extinguishers in camp sites, if any;
(xii) Compensation for the loss of life (a zero tolerance to loss of life policy should be developed and implemented) or for any type of injuries; and
(xiii) Provide adequate insurance to the workers that is current throughout the construction period;
(xiv) Conduct Health and safety training periodically and Daily Toolbox Training for all site personnel.

123. **Community health and safety risks.** Communities will be moderately exposed to threats due to impacts on air and water quality, ambient noise level; mobility of people, goods, and services; accesses to properties, economic activities, and social services; service disruptions, etc. To mitigate these impacts, the contractor will be required to implement the following measures:

(i) Code of conduct for workers includes restricting workers in designated areas, no open defecation, no littering, no firewood collection, no fire except designated places, no trespassing, no residence at construction sites, and no obligation to potentially dangerous work;
(ii) Follow International best practices on community health and safety such as those in Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities16.
(iii) Follow established community health and safety protocol on emerging infectious diseases such as COVID-19;
(iv) Implement measure to prevent proliferation of vectors of diseases at work site;
(v) Maintain a complaint logbook in worker's camp and take action promptly of complaints. Follow the established GRM of the overall project (URLIP);
(vi) Schedule transportation activities by avoiding peak traffic periods;
(vii) Clean wheels and undercarriage of haul trucks prior to leaving construction site;
(viii) Educate drivers: limit speed not more than 30 km/h in settlements and avoid use of horn;
(ix) Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement;
(x) Provide prior information to local people, particularly the Temples and other places of worship nearby about work schedules;

[16] IFC World Bank Group. 2007. Environmental, Health and Safety (EHS) Guidelines – General EHS Guidelines: Environmental – Noise Management.

(xi) Noise barriers must be installed in between the construction site and any community halls or places of worship to reduce the noise level;
(xii) Provide adequate space and lighting, temporary fences, reflectorized barriers and signages at the work site; and
(xiii) Ensure contractor has staff trained on emergency response.

124. **Post-construction clean-up and reinstatement.** Construction debris, spoils, and excess construction materials may pose hazards to properties, community and environment if left unattended after construction. The contractor will reinstate all working areas and access routes as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition. The following generic measures should be taken:

(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required;
(ii) All excavated roads shall be reinstated to original condition;
(iii) All disrupted utilities restored;
(iv) All affected structures rehabilitated/compensated;
(v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;
(vi) All hardened surfaces within the construction camp area shall be ripped;
(vii) All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document;
(viii) The contractor must arrange the cancellation of all temporary services;
(ix) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.

## D. Operational Phase Impacts and Mitigation Measures

125. **Impact from O&M of Roads and Drains.** In the operations and maintenance (O&M) phase, the roads will operate with routine maintenance, which should not affect the environment. Routine repairs will be very small in scale, to be conducted manually by small teams of men with simple equipment (shovels, wheelbarrows, etc.) and works will be very short in duration thus will not cause significant physical impacts. Traffic may be interrupted temporarily but this work will be very small in scale, infrequent, and short in duration, so there will be no economic or other implications. The infrastructures will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

126. To maintain the safety of workers and road-users, such work should be coordinated with the local police department so that adequate warning signs and traffic diversions can be set up when necessary. Debris need to be collected and disposed at a designated site such as the landfill. Community participation will be encouraged in ensuring drainage canals are clog-free through information and behavior change campaigns and incentives, if possible.

127. **Air pollution and noise.** Improved roads may result in elevated noise level and air emissions from increased vehicular traffic over time. However, the extent of air pollution will depend upon i) the rate of vehicular emission and ii) the prevailing meteorological conditions. In this regard, it should be noted that the Airport to Lakeside Link Road is being constructed as an alternative road to link the Airport with the town during the time when the work on improving the

existing Link Road is being implemented. Hence, the traffic along the improved Airport to Lakeside Link Road will have a high growth during the initial years and later taper off once the existing Airport Link Road is upgraded. Hence, air quality and noise along the proposed Airport to Lakeside Link Road is likely to be impacted during the operation period.

128. **Community safety.** Improved roads may give way to faster vehicle speeds which could endanger people and households along the road alignments. Also, as mentioned earlier, the Airport to Lakeside Link Road is being constructed as an alternative road to link the Airport with the town during the time when the work on improving the existing Link Road is being implemented. Hence, the traffic along the improved Airport to Lakeside Link Road will have a high growth during the initial years and later taper off once the existing Airport Link Road is upgraded. Hence, the community safety will be impacted because of the dense traffic. Further, the damages to the roads that might occur because of the increased traffic may impact the safety of motorists and pedestrians, as well. To mitigate these impacts, the PIU will be required to:

(i) Conduct regular inspection of the roads to check for damages, and undertake rehabilitation measures for any damages found;
(ii) Inspect and maintain the integrity of road barriers, especially at critical curves or locations that are prone to vehicular accidents;
(iii) Inspect and maintain speed limiters such as humps installed on road sections near residential areas, schools, and religious establishments.
(iv) Inspect and maintain all road signages, including appropriate warning signages at silent zones, and ensure that these are reflectorized and visible even during night time; and
(v) Ensure pedestrian crossings are maintained.

## E. Cumulative Impacts and Mitigation Measures

129. There are no similar construction or project activities in the area that would result in cumulative environmental impacts. Direct impacts during construction phase, including, among others, increase in noise levels, fugitive dust, and common air emissions near the construction areas, are temporary in nature and will not result in cumulative adverse impacts to people and environment with the implementation of mitigation measures discussed in this IEE report.

## F. Unanticipated Impacts during Construction and Operation

130. In the event of unanticipated environmental impacts not considered as significant during implementation and not considered in the IEE and EMP, the PCU shall prepare a corresponding time-bound and budgeted corrective action plan acceptable to ADB and ensure that these are implemented by the contractor/s and reported accordingly in environmental monitoring reports to ADB. If unanticipated environmental impacts deemed as significant become apparent during project implementation, the PCU will: (i) inform and seek ADB's advice, wherever necessary; (ii) assess the significance of such unanticipated impacts; (iii) evaluate the options available to address them; and (iv) update the IEE including EMP.

# VI. ENVIRONMENTAL MANGEMENT PLAN

131. This Environmental Management Plan (EMP) has been prepared in accordance with the ADB's SPS 2009. This EMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout design, construction and operation periods of the project, to avoid, minimize or offset the potential environmental impacts identified in the chapter on Anticipated Environmental Impacts and Mitigation Measures of this IEE. This chapter also discusses the institutional arrangement, roles, and responsibilities for the effective implementation of the EMP.

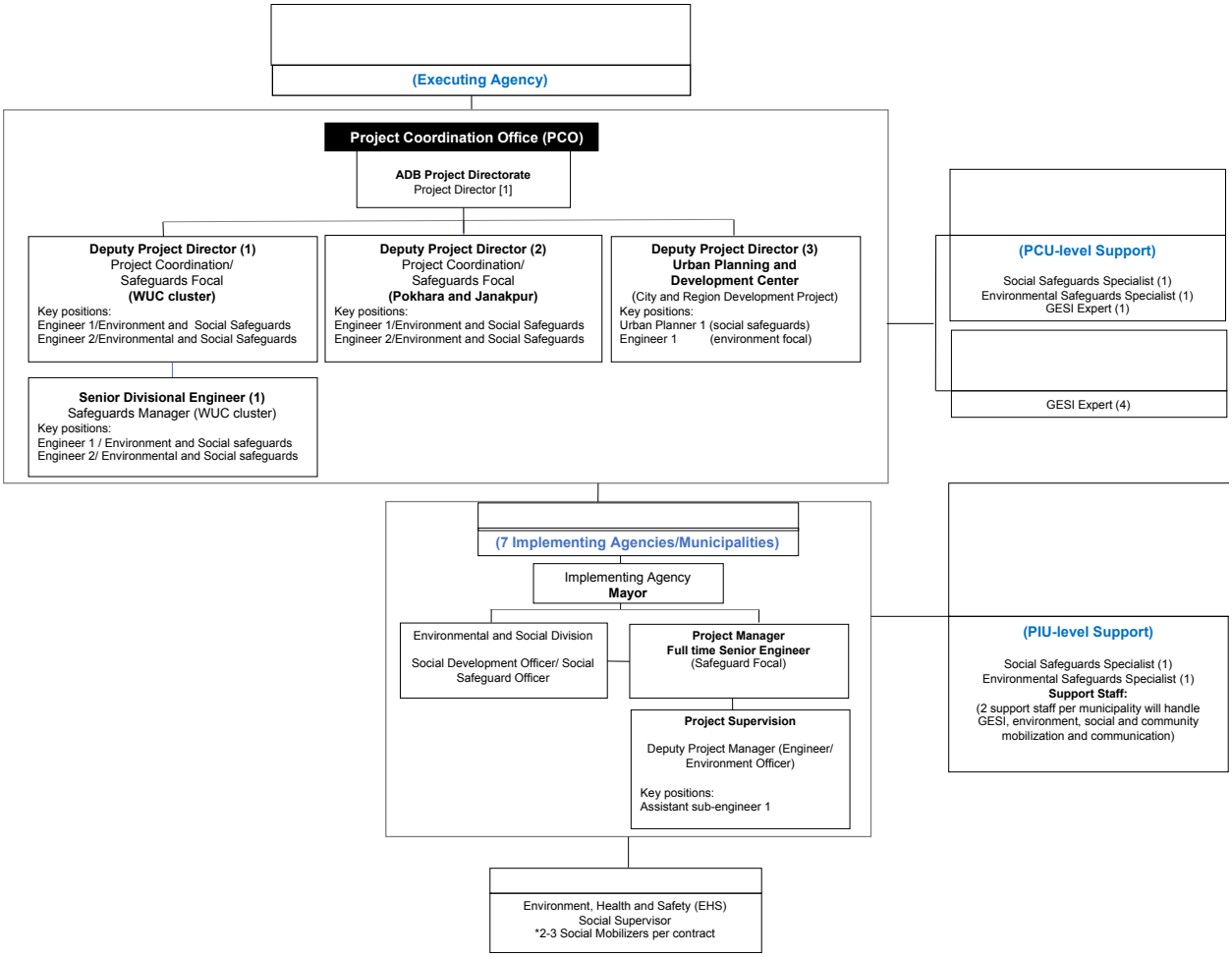
## A. Institutional Arrangement

132. The Ministry of Urban Development through the Department of Urban Development and Building Construction will be the executing agency of the project, which will be supported by the Project Management and Capacity Development Consultant (PMCDC), and Institutional Strengthening and Community Participation Consultant (ISCPC). The PCO will be responsible for the overall management of the project. The municipalities will be the key implementing units of the project. The PIU with the support of the Supervision and Design Consultant (SDC) will be responsible for social safeguards compliance, monitoring, and reporting to ADB.

### Safeguards Implementation Arrangement

133. **Project Coordination Office (PCO).** The PCO will be headed by a Project Director, who will be responsible for the overall project management. The Project Director shall be supported by three Deputy Project Directors (DPDs) – DPD WUC cluster, DPD Pokhara and Janakpur cluster, and DPD for Urban Planning and Development. The PCO will have an environment safeguards officers of engineer rank, who will be responsible for environmental safeguards compliance, planning, and implementation as per the agreed environmental assessment and review framework, IEEs and EMPs prepared consistent with the ADB's SPS and GON rules and regulations. Implementation arrangements for safeguards in implementation in URLIP presented in Figure 3.

**Figure 18: Implementation Arrangement for Safeguard Implementation**




134. **Project Coordination Office (PCO).** Roles and responsibilities of PCO (environmental safeguards) are:

(i) Ensure subprojects comply with the national and local statutory and legal environmental requirements, ADB SPS 2009, EARF and environmental safeguards provisions of the ADB loan covenants;
(ii) Ensure subprojects conform to exclusion criteria and subproject selection guidelines as stipulated in this EARF;
(iii) Review and approve the environmental categorization of future subprojects;
(iv) Engage additional experts (heritage and biodiversity experts) if project conditions warrant such expertise to prepare safeguard documents
(v) Review and approve subproject IEE reports, including EMPs, and ensure that subproject IEEs and EMPs are updated based on final detailed designs and submit to ADB for review, clearance, and disclosure prior to bid invitation;
(vi) Ensure that robust chance-find protocol is put in place and implemented properly;
(vii) Ensure that updated/final IEEs based on final detailed design are provided to the construction contractor prior to start of construction;

(viii) Ensure that the IEEs including EMPs are updated in case of changes in detailed design that may occur during implementation phase, and submitted to ADB for review, clearance and disclosure;
(ix) Ensure that IEEs with EMPs are included in bidding documents and civil works contracts;
(x) Ensure that the requirement for contractors to prepare their respective Health and Safety (H&S) Plans including COVID-19 H&S Plans is included in bidding documents and civil works contracts;
(xi) Review and approve site-specific EMP (SEMP) of selected contractor;
(xii) Provide oversight on environmental management aspects of the project, and ensure EMP and SEMP is implemented by contractors;
(xiii) Establish a system to monitor environmental safeguards of the Project including monitoring the indicators set out in the monitoring plan of the IEE;
(xiv) Facilitate timely and ensure overall compliance with all national and local government rules and regulations regarding site and environmental permits/clearances/approvals as well as any other environmental requirements as relevant;
(xv) Review, monitor and evaluate effectiveness with which the EMP, SEMP, and Health and Safety Plan are implemented, and recommend necessary corrective actions to be taken;
(xvi) With support from PMCDC, consolidate quarterly monitoring reports from the PIUs and submit semi-annual environmental monitoring reports (SEMRs) to ADB;
(xvii) Ensure availability of budget for safeguards activities;
(xviii) Ensure adequate awareness campaigns, information disclosure among affected communities and timely disclosure of final IEEs/EMPs and SEMRs, including corrective action plans, if any, in project website and in a form accessible to the public;
(xix) Address any grievances brought through the grievance redress mechanism (GRM) described in this IEE report in a timely manner;
(xx) Undertake regular review of safeguards-related loan covenants, and the compliance during project implementation; and
(xxi) Organize periodic capacity building and training programs on safeguards for stakeholders, PIUs and contractors.

135. **Project Coordination Unit (PCU).** The municipalities will act as the implementing agencies of the project, under the guidance and overall management of the PCO. The roles and responsibilities of the PIU (Environmental Safeguards) are as follows:

(i) Ensure subprojects comply with the national and local statutory and legal environmental requirements, ADB SPS 2009, EARF and environmental safeguards provisions of the ADB loan covenants;
(ii) Ensure subprojects location and design confirms with exclusion criteria and subproject selection guidelines as stipulated in this EARF; closely work with design teams to ensure compliance
(iii) Review subproject IEE reports, including EMPs, and ensure that subproject IEEs and EMPs are updated based on final detailed designs and submit to ADB for review, clearance, and disclosure prior to bid invitation;
(iv) Ensure compliance with government and ADB requirements on environmental safeguards;
(v) With support from SDC, review and approve SEMPs prepared by contractor;

(vi) Conduct regular site visits, including spot checks, to ensure the proper implementation of EMP;
(vii) Review monthly reports from contractor;
(viii) Prepare Quarterly Reports on all aspects concerning environmental assessment, management, and monitoring obtain approval from PIU and submit approved reports to the PCU;
(ix) Address any grievances brought about through the GRM as described in the IEE report in a timely manner; and
(x) Support all other environmental safeguards-related activities and tasks of the PCU as may be needed.

136. **Project Management and Capacity Development Consultants (PMCDC)**. PMCDC will provide capacity building support on safeguards, and safeguards compliance in line with ADB procedures. PMCDC will appoint an environmental safeguards specialist to carry out all environmental safeguards related tasks and provide support to PCO safeguards team to oversee the implementation of the safeguards framework/safeguards planning documents. The environmental safeguards specialist will guide the safeguards officers at the PCO and shall coordinate with the SDC's Environmental Safeguards Specialist (PIU-support) for carrying out all social safeguards related tasks. The Environmental Safeguards Specialist (PMCDC) will be responsible for carrying out following tasks:

(i) Support PCU and PIUs in selecting the output 2 components in compliance with subproject selection criteria; ensure that no components falling under exclusion criteria are considered for implementation under the project
(ii) Screen and categorize output 2 subprojects based on this EARF;
(iii) Guide PIUs / prepare the initial environmental examination (IEE) reports including environmental management plans (EMPs) based on design of the subprojects and in accordance with ADB SPS and national laws, regulations, policies and guidelines;
(iv) Advise PCO in engaging additional experts (heritage and biodiversity) where required if the project conditions warrant
(v) Support PCU/PIU in obtaining clearances and permissions per GON regulations
(vi) Update/Finalize the IEE report including EMP based on final detailed design of the subproject and in accordance with ADB SPS and national laws, regulations, policies and guidelines;
(vii) Conduct due diligence of associated facilities and/or audit of existing facilities, if any, during the detailed design phase, as defined in ADB SPS;
(viii) Conduct of meaningful consultations and ensure issues/concerns/suggestions raised are incorporated in the design and updated/final IEE report;
(ix) Ensure relevant provisions from the updated/final IEE report and EMP are incorporated in the bid and contract documents;
(x) Establish grievance redressal mechanism and ensure members of the grievance committee have the necessary capacity to resolve project-related issues/concerns;
(xi) Together with the social safeguard experts, conduct safeguards capacity building to ensure PCU and PIU have the capacity to implement, monitor, and report on implementation of EMP, resettlement plans and indigenous peoples plans (if any); and
(xii) Monitor implementation of EMP at all work sites, including all potential safeguard issues identified in the safeguard documentation mentioned above;
(xiii) Monitor any unanticipated environmental risks or impacts that arise during construction, implementation or operation of the subproject that were not

considered in the IEE report and EMP. Prepare corrective action plans and ensure that these are implemented by the contractor and reported accordingly in environmental monitoring reports to ADB; and

(xiv) Undertake all other tasks to ensure the subproject complies with ADB SPS and national environmental laws, rules, and regulations.

137. **Supervision and Design Consultant (SDC).** Two SDCs will be established – (i) the WUC cluster, covering Devdaha, Siddharthnagar, Tilottama, Sainamaina and Lumbini; and (ii) Janakpur. SDCs will be responsible to support the PIU in the implementation and monitoring of safeguards compliance. They will also be responsible to prepare Output 2 designs, prepare safeguards documents in line with the EARF for Output 2 components. The SDCs will be supported by two support staff per municipality who will handle gender, environment and social safeguards, community mobilization, and communication.

138. **Design Supervision Consultant (DSC).** The DSC will support Pokhara municipality in the design and supervision of infrastructure and greens solutions, implementing heritage and cultural improvement plans, and design of tourism infrastructure components. The DSC environmental safeguards specialist will be involved in detailed design and safeguards documents preparation of output 2 components.

139. The key environmental safeguards tasks of SDC and DSC include:

(i) Work closely with technical teams, and assist PIUs in selecting the output 2 components in compliance with subproject selection criteria; ensure that no components falling under exclusion criteria are considered for implementation under the project
(ii) Prepare categorization checklists and assist in categorization of the project output 2 components in respective municipality
(iii) Update/Finalize the initial environmental examination (IEE) report including environmental management plans (EMP) based on final detailed design of the subproject and in accordance with ADB SPS and national laws, regulations, policies and guidelines;
(iv) Conduct due diligence of associated facilities and/or audit of existing facilities, if any, during the detailed design phase, as defined in ADB SPS;
(v) take proactive action to anticipate and avoid delays in implementation;
(vi) under the guidance of PMCDC, develop system of indicators to monitor implementation of resettlement activities and ensure corrective actions are undertaken, if and as required;
(vii) obtain environmental safeguard related information with the help of field support staff and consolidate them; prepare periodic environmental safeguard monitoring reports;
(viii) compile all monitoring inputs at PIU level for quarterly progress reports, for onward transmission to PCU and PMCDC;
(ix) assist PIUs in conducting public consultation and disclosure activities related to social safeguards; and
(x) actively participate, assist in resolving all grievance redress activities; and support ISCPC in all training and capacity building activities.

140. **Civil Works Contract and Contractor.** The IEE with EMP will form part of bidding and contract documents and verified by PMU. The Contractor will be required to designate an Environment, Health and Safety (EHS) Officer (or equivalent) with relevant qualifications and

adequate experience to ensure implementation of EMP during construction period. Contractor is to carry out all environmental mitigation and monitoring measures outlined in their contract and the IEE. The Contractor will be required to submit to PIU, for review and approval, a SEMP including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program per EMP; and (iv) budget for SEMP and EMP implementation. No works can commence until SEMP is approved by PIU.

141. Specifically, the Contractor will have the following responsibilities, among others that will be included in the bid and contract documents.

(i) Ensure that the infrastructure development works are carried out in an environmentally friendly manner, minimizing environmental impacts while ensuring the health and safety of all its workers and the minimizing disturbance to the surrounding environment and communities;
(ii) Consideration of ADB SPS, national regulations and the EMP during bid preparation and cost estimation;
(iii) Appoint a full time EHS Officer with relevant qualifications and adequate experience to carryout responsibilities for complying with the ADB SPS requirements, national regulations and the EMP. The officer/staff must have a clear term of reference and responsibilities to ensure proper management of environmental issues;
(iv) Ensure regular reporting to the PIU on work progress and alert management on any potential issues or delays;
(v) Strictly follow COVID 19 protocols and other COVID-19 related instructions issued by the GoN at all construction sites and campsites and provide periodic reports to PIU on its compliance;
(vi) Obtain the necessary permits and clearances, if any is required for the contractor, to implement the subproject;
(vii) Ensure that all worker recruitment and OHS requirements are complied with;
(viii) Take necessary corrective action to rectify any non-conformance, including actions related to grievances;
(ix) Institute an emergency plan for natural calamities/disasters and accidents at the site; and
(x) Follow chance finds procedures to discovery of any physical cultural artifact.

142. A copy of the EMP/approved SEMP will be kept on-site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP/SEMP constitutes a failure in compliance and will require corrective actions.

143. PCU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the proposed project sites

## B. Environmental Management Plan (EMP)

144. The EMP is necessary on the grounds that it will manage the environment by offsetting the negative impacts with possible mitigation measures and enhancing the positive impacts within the allocated fund from the project. Thus, the main objectives of the EMP for the construction of the access road project are:

(i) Define the responsibilities of the project proponents in accordance with all project phases viz., (design, pre-construction, construction and operation);
(ii) Facilitate the implementation of the mitigation measures by providing the technical details of each project impact, and proposing an implementation schedule of the proposed mitigation measures;
(iii) Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented;
(iv) Identify training requirements at various levels and provide a plan for the implementation of training sessions;
(v) Identify the resources required to implement the EMP and outline corresponding financing arrangements; and providing a cost estimate for all proposed EMP actions.

145. The EMP Matrix for Construction Phase and EMP Matrix for the Operational Phase of the Pokhara Subproject is presented in Table 13 and Table 14, respectively.

**Table 13: Environmental Management Plan Matrix (Design and Construction Phase) – Applicable to Pokhara Subproject**

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| **1. Design phase** | | | | |
| Impact from Landslides | On the subproject, the landslides are likely to occur during the construction and / operation of the Panchase Road. Landslides can block the road and can also cause heavy damage to the agricultural fields and the protected forests located near the Panchase Road and the Wetlands in the downstream, as well. | • Recognition and investigation of unstable areas should be performed;<br>• Upon identifying the possible landslide locations, design of an appropriate preventive measure should be determined for each of these locations. These could be any or a combination of the following viz., improving drainage, reducing the angle of the slope, excavating to unload the top of the slope and /or building a protective berm or wall to buttress the bottom of the slope;<br>• Additional construction measures such as building retaining walls, soil nailing, ground anchor walls and use of horizontal drains can be explored, as well.<br>• All the landslide prevention measures should be incorporated in the Final Design. | PIU, DSC | PCU, PMCDC |
| Impacts to Local hydrology | Local waterlogging problems and obstruction of natural water flows in the vicinity. On Panchase Road, the obstruction of natural water flows could also cause landslides. | • Detailed assessment of the micro-hydrology and topography of the project site;<br>• Design the roads according to the slope and elevation relative to the water bodies that may exist in the area; and<br>• Provide the appropriate design of drains for road stretches that do not have existing drainage or where persistent flooding has been recorded | PIU, DSC | PCU, PMCDC |
| Damage / Disturbance to common properties and physical cultural resources (PCRs). | Disturbance to common properties (such as ramps, drainage, boundary walls, houses, soak well, lamp post), and PCRs such as graveyards and places of worship will be avoided. | • Conduct investigation at site to determine if any existing private or common properties/structures will be disturbed during construction phase;<br>• Conduct meaningful consultation with relevant stakeholders where common properties are impacted by the construction works;<br>• Ensure that all works will be confined within existing road and side drains alignments, and within existing ROWs;<br>• avoid disturbance or damage of PCRs (e.g., places of worship, graveyards) through proper design of road alignments and demarcating construction area; and | PIU, DSC | PCU, PMCDC |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • ensure the implementation of construction phase EMP to avoid disturbance / damage to common properties and / or PCRs. | | |
| Impact to Local Vegetation and Trees | The improvements to the Panchase Road will not impact the local biological environment including trees, birds and any other animals. However, the Airport – Lakeside Link Road improvements will impact certain sacred Peepal (*Ficus religiosa*) trees. | • Impacts to the trees will be avoided through modification in road / drain alignments locally;<br>• After final design, conduct a tree survey along the final road alignment and if trees are impacted, appropriate compensatory afforestation measures should be implemented upon ensuring the following:<br>• Do not cut protected trees, retain the tree / alter the alignment/layout of road/drain locally to preserve the trees;<br>• Conduct survey of trees for bird nests prior to cutting; if any active nests, ensure that trees are not disturbed until young birds fly away from the nests; do not cut trees during the breeding season; and<br>• Obtain any necessary approval from appropriate agencies such as Forest Department to implement the compensatory conservation measures developed. | PCU, PIU | EA, ADB |
| **2. Pre-Construction Phase** | | | | |
| Consents, permits and clearances | Failure to obtain necessary consents, permits, and clearances can result in design revisions and/or stoppage of the Works. | • All necessary local clearances and no objection certificates will be obtained prior to award of contract.<br>• Environmental clearance will be obtained prior to award of contract. | PCU, PIU, PMCDC | EA, ADB |
| Integration of EMP in bidding documents and contracts | Lack of awareness by contractors on ADB SPS requirements may result in insufficient budget and non-implementation of EMP | • The PCU will incorporate the costs of implementing OHS and the EMP as well as specific provisions requiring contractors to comply with all other conditions required by ADB into the bidding and contract document.<br>• Once the Contractor is selected, the PCU/PIU with support from PMCDC will inform contractors of their responsibilities in EMP implementation, in compliance with ADB and government requirements, self -monitoring and reporting procedures. | PCU, PMCDC | EA, ADB |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| EMP Implementation Training | If the contractors and construction supervision engineers are not aware about the requirements of this EMP, the project may not proceed and comply with ADB and GoN environmental policies. | The PCU, PIU and contractors will be required to undergo training on EMP implementation. | PCU, PIU, PMCDC | EA, ADB |
| Updating of IEE | IEE and EMP out of date due to changing conditions or design | • The PCU shall update the IEE in case of change in design/based on the final detailed design and submit the same for review and clearance of ADB. | PCU, PMCDC | EA, ADB |
| Community Awareness on Project Activities and Impacts | Lack of community awareness on project activities may result in potential community health and safety concerns and complaints. | • Before construction start, a meaningful consultation with the affected communities will be conducted. The is consultation will aim to engage community stakeholders, listen to their views, and try to come to a common understanding about the need for the subproject and the processes involved to achieve the outcome. To aid in the consultation process, it is important that the community should be made aware of the details of project activities. Important information to be disseminated to the people are, among others, the following:<br>• Overview and objectives of the proposed project;<br>• Preliminary and/or final detailed design of proposed project components;<br>• Potential environmental and social impacts (positive and negative) of the project, and the proposed mitigation measures for the perceived negative impacts; and<br>• Grievance redress mechanism and contact details of the project. | PIU, Contractor | PCU, PMCDC |
| Chance Finds | Damage / disruption of archeological remains | • Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;<br>• Stop work immediately to allow further investigation if any finds are suspected;<br>• Inform the DOA if a find is suspected and take any action they require to ensure its removal or protection in situ; and | PIU, DSC | PCU, PMCDC |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Follow the written instructions of DOA for continuation of works. | | |
| Construction materials | Impacts due to mining and borrow areas | • Reuse the excavated soils and road material as much as possible in the construction, and minimize the need for new material.<br>• Use material sources permitted by government(DOMG)<br>• Avoid creation of new borrow areas as much as possible, in unavoidable cases, obtain all permissions and clearances, including conduct of environmental assessment studies and obtaining environmental clearances<br>• Ensure that borrow areas are not located in environmentally sensitive areas,<br>• Prepare borrow area management plan and implement<br>• Verify suitability of all material sources and obtain approval of PIU;<br>• Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site does not cause impact on health and safety of the workers and the community; and<br>• Submit to PIU on a monthly basis documentation of sources of materials. . If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party, contractor will ensure that all the parties/ suppliers necessary clearances and permission as per the Nepal law and will provide the documentary evidence to PIU/consultants.<br>• | PIU, Contractor | PCU, PMCDC |
| **3. Construction phase** | | | | |
| Construction Planning | Inadequate planning could lead to non- | • Appoint an Environmental Health and Safety (EHS) Supervisor; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | implementation of EMP during the construction phase and result in significant environmental impacts leading to non-compliance with ADB's environmental safeguard requirements. | • Develop a Site-Specific Environmental Management Plan (SEMP) and get it approved from the Client;<br>• The SEMP should cover (a) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes, (b) specific mitigation measures following the approved EMP; (c) monitoring program as per EMP; and (d) budget for SEMP implementation. The SEMP will include the following, among others:<br>• Construction Compound Management Plan;<br>• Construction Health and Safety Plan (including COVID-19 H&S guidance);<br>• Emergency Incident Response Plan.<br>• Conduct training on the rationale for and implementation of the SEMP and EMP to enhance general understanding and clarify responsibilities regarding implementation, including monitoring and reporting, must also be provided to all relevant staff of contractors;<br>• While the locations of the two project components have been finalized, the locations for labour campsites, batching plant site etc. that would be required by the Contractor temporarily during the construction period, have not been finalized. The Contractor should select the locations for the campsites, batching plant sites etc. in consultation with Pokhara Metropolitan City and get it approved from the PCU and PIU. The Contractor should provide all infrastructure and services necessary to ensure that the labourers' needs are addressed throughout their stay at the campsites. Also, the Contractor should deploy construction equipment, plant and machinery in good condition, provided with necessary pollution control apparatus, and operate as per standards and meet all environmental standards specified by the GoN for such operations; Contractor shall ensure necessary fitness, pollution under control certificates, and are operated by qualified / licensed drivers/operators. | | |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • No works can commence prior to approval of SEMP. | | |
| Disruption of Existing Utilities | Disruption of infrastructure and services | • conduct investigation at site to determine all the existing utilities that will likely be disturbed during construction phase;<br>• all underground utilities should be marked prior to any construction works to be taken up at the locations; and<br>• coordinate with agencies responsible for the maintenance of the utilities and formulate a plan to minimize disruption of services during construction phase. The plan must be formulated in coordination with PCU and stakeholders at the site. Where required, the responsible agency shall be requested by PIU to carry out the necessary works at the time required and at cost of the subproject. | Contractor | PCU, PMCDC |
| Excavation Works | Excavations may affect local drainage patterns if surface and groundwater collect in voids as they are being dug. | • All excavations shall be done to the minimum dimension as required for safety and working facility;<br>• Excavations should be carried out after identifying the location of all utilities that exist along the project area;<br>• The excavation shall be executed in such manner, that the contractor does not damage or interfere with existing services or structures. If damage or interference is so caused, the contractor shall make arrangements with the supply and/or building owner to execute the repairs at the contractor's own cost;<br>• Explore working in off-peak hours or night on busy road sections with prior permission and with proper lighting and safety measures; however, no noisy works shall be conducted in the night;<br>• Road drains and channels shall be kept free from obstructions at all times;<br>• Excavated areas should be sufficiently demarcated so as not to affect the health and safety of workers and the people using the road alignment for their daily activities. | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| Excavated Earth Management | Excavation during construction will generate loose soil which can be carried through surface run-off during a rainfall. | • The Contractor shall plan the works in a way that minimizes surface excavation works during the rainy season, where practicable.<br>• Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms shall be developed by the Contractor.<br>• The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered.<br>• Channels, earth bunds, netting, tarpaulin and or sandbag barriers shall be used on site to manage surface water runoff and minimize erosion.<br>• The overall slope of the works areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows.<br>• Monitor water quality that could exist close to the working areas to ensure compliance. | Contractor | DSC, PIU, PMCDC, PCU |
| Impact on Surface Water Quality | Silt-laden run-off from stockpiled materials, solid wastes and domestic wastewater from the construction camp, and leaks from chemical storage areas and machineries may contaminate or result in water pollution if disposed or discharged to nearby receiving bodies of water. Also, maintaining the surface water quality is very critical during the Panchase Road construction as the streams and springs are | • Provision of temporary sedimentation canal and/or silt traps along construction areas, particularly alignments that are adjacent to receiving bodies of water or canals;<br>• The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the PMCDC to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work;<br>• All temporary discharge points shall be located, designed and constructed in a manner that will minimize erosion in the receiving channels;<br>• Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | the drinking water sources for a number of hill communities, as well | • Use surplus soil for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas;<br>• Avoid scheduling of excavation work during the monsoon season;<br>• Confine construction area including the material storage (sand and aggregate) so that runoff will not enter the site;<br>• Ensure that drains are not blocked with excavated soil or other materials;<br>• Stockyards at least 50 meters (m) away from watercourses;<br>• Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110%;<br>• Effective maintenance of machinery and vehicles to avoid leakages;<br>• For effluents from workplace, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs; provide proper systems for collection, treatment and safe disposal of wastewater from construction camps and facilities; no pit latrines shall be allowed; toilets. And wastewater outlets shall be connected to city sewerage systems (if available) or septic tanks and soak pit systems developed within the site. Septic tanks should be sealed from bottom and sides to prevent seepage.<br>• Solid waste management, as detailed in the approved SEMP, should be implemented throughout the construction period;<br>• Monitor water quality according to the environmental monitoring plan | | |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| Impact on Groundwater | Increased groundwater demand for construction and consumption use can deplete the Groundwater Table; Unscientific Solid Waste and Construction Waste Disposal can lead to contamination of ground water, | • Use groundwater resources judiciously and as per the approved Groundwater Management Plan defined in the SEMP;<br>• Prevent pollutants from contaminating the soil and groundwater;<br>• All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned;<br>• Storage of lubricants and fuel at least 50m from water bodies and in double-hulled tanks;<br>• Effective maintenance of machinery and vehicles to avoid leakages;<br>• Effective management of solid waste and construction debris as per an approved SEMP;<br>• Provide uncontaminated water for dust suppression;<br>• Monitor Groundwater Quality according to the Environmental Monitoring Plan. | Contractor | DSC, PIU, PMCDC, PCU |
| Drainage Management | Construction material getting into surface run off or uncontrolled disposal may cause drainage congestion, flooding or waterlogging in neighboring areas. | • The contractor shall adopt a site clearance procedure that separates topsoil and stores it under appropriate conditions for reuse as instructed by the Engineer.<br>• Wastes and construction debris will not be disposed in a manner that these would end up in drainage canals.<br>• The on-site storage of excessive quantities of unwanted spoil and aggregate materials should be avoided. Where storage is necessary, the Contractor shall ensure heaps and stockpiles are located at sites that they do not permit direct runoff into watercourses and are on land sloping at less than 1.5%.<br>• All heaps shall be of a size and stability that will ensure the risk of mass movement during period of heavy rainfall is minimized. | Contractor | DSC, PIU, PMCDC, PCU |
| Impact on Air Quality | Construction activities including transport and storage of raw materials will likely create dust and emissions that could | • Take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards;<br>• Fit all heavy equipment and machinery with air pollution control devices that are operating correctly; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | deteriorate ambient air quality in the area. During Panchase Road construction, the impact on air quality can cause deleterious impacts on the local ecosystem, as well. | • Construction vehicles must travel at speeds that minimizes dust generation;<br>• Reduce dust by spraying water on stockpiled soil, excavated materials, and spoils;<br>• Cover with tarpaulin vehicles transporting soil and sand;<br>• Cover stockpiled construction materials with tarpaulin or plastic sheets;<br>• Water spraying to access roads, camp sites and work sites to reduce dust emissions;<br>• Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications;<br>• All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant standards;<br>• Repair and maintain access roads, as necessary.<br>• prohibit burning firewood in work and labor camps (promote liquified petroleum gas for cooking purposes and electric heater for heating purposes;<br>• use vehicles that have government-issued permits and registrations; and<br>• prohibit open burning of solid waste;<br>• Monitor air quality according to the environmental monitoring plan. | | |
| Impact on Noise | Noise generation may disturb nearby sensitive receptors | • Arrive at the construction schedule upon discussions with the nearby stakeholders, especially when works are carried out near sensitive receptors such as hospitals, schools, places of worship etc.;<br>• Install noise barriers between the source and receptor, where necessary;<br>• Enclose and locate generators away from sensitive receptors;<br>• Operate construction machines / conduct noise operations sequentially rather than all together; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • spread out the schedule of material, spoil and waste transport;<br>• minimize drop heights when loading and unloading coarse aggregates;<br>• avoid use of horns unless absolutely necessary;<br>• Select electrically powered plant that is quieter than diesel or petrol-driven plant, if interchangeable;<br>• Use modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions, and ensure they are maintained to manufacturers' specifications;<br>• Noise-generating equipment must be fitted with silencers;<br>• Optimize the use of noisy construction equipment and turn off any equipment if not in use;<br>• Regular maintenance of all equipment and vehicles;<br>• Stop all construction activities during at night;<br>• Implement a complaint handling system;<br>• Workers should be provided with Ear muffs / protective hearing equipment in noise critical areas;<br>• Place visually clear instructions in areas where noise levels are significant;<br>• Measure noise levels periodically as per the Environmental Monitoring Plan. | | |
| Construction Waste Management | Inadequate management of construction wastes will result in negative impact on the soil, aesthetic beauty of area and workers' health and safety. | • Prepare Construction Waste Management Plan as par the SEMP;<br>• Identify and seek approval for the areas where construction waste could be disposed;<br>• The contractors should take every opportunity to reduce the amounts of waste generated and collect recyclable material for processing by local operators.<br>• Contractor shall implement waste segregation on site.<br>• Receptacles for solid waste should be provided for the use of workers, and their contents should be disposed properly; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Clean construction waste such as excess soil or rubble should be used in landscaping on site or given to landowners and developers seeking fill material.<br>• Waste auditing. The contractor will record the quantity in tons and types of waste and materials leaving site during the construction phase;<br>• Waste fuels/oils may be generated from equipment used on-site during construction and may be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by relevant parties;<br>• All construction waste should be managed as per the approved SEMP. | | |
| Impact on Trees and Vegetation | A preliminary survey along the two road alignments indicated that no tree will be impacted from the project on Panchase Road. A few Peepal (*Ficus religiosa*) trees located at the edge of the ROW along the Airport to Lakeside Link Road will be impacted. However, these will be protected by altering road / drain alignments locally. The Mitigation Measure should be implemented upon finalization of the designs. | • The first priority is to avoid cutting of trees through changes in design and road alignments. This is in particular important when the tree species is protected or considered sacred by the community and / or houses nests for birds;<br>• Do not cut any protected tree species; retain the tree / alter the alignment / layout of road/ drain locally to preserve the trees;<br>• after the finalization of the designs and layout of the project components, the trees within proposed construction areas will be marked;<br>• trees within area required for construction will be felled after prior approval;<br>• replacement of the tree shall be undertaken by the project i.e., PIU at the replacement ratio of ten trees for every tree that is cut (i.e., 1:10 ratio as per Forest Regulations,2022) Indigenous/native species will be preferred in tree planting;<br>• only trees that will require removal within the proposed construction areas of the sites will be cut;<br>• For trees that will not be cut, take all precautions to protect them from any damage from construction activities | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Conduct survey of trees for bird nests prior to cutting; if any active nests, ensure that trees are not disturbed until young birds fly away from the nests; do not cut trees during the breeding season. | | |
| Impact on Aquatic Ecology | Siltation, chemical spills, improper waste disposal may affect the water quality of nearby ponds and any thriving aquatic species. | • Take all measures to mitigate the occurrence of landslides;<br>• Provide temporary protection at sections near the ponds to avoid sliding of soils;<br>• Store spoils away from the side of the river/pond;<br>• Implement proper storage/disposal of materials, chemicals and waste<br>• Implement mitigation measures for excavation, soil erosion and sediment mobilization, surface water pollution, and construction waste generation;<br>• Conduct sampling and analysis of the surface water near to the construction sites as part of the Environmental Monitoring Plan. | Contractor | DSC, PIU, PMCDC, PCU |
| Impacts on protected areas (Ramsar wetland) | Impact on sensitive environmental features due to construction activities | • Ensure that no construction camp or facility is located within 1 km of the Pahwa Lake<br>• Ensure provision of proper sanitation and wastewater collection and treatment systems, including on site treatment facilities such as septic tank and soak pits<br>• Maintain the workers camp sites and work sites cleanly, and ensure that there is no solid waste disposal or open defecation; create awareness among the workers and staff and ensure and enforce strict site rules<br>• Implement measures suggested in drainage and surface water quality to ensure that no silt laden runoff is either not generated or contained within the site if generated and measures to manage spillage of oils, chemicals, fuels etc., is managed.<br>• Build awareness amongst the workers to prevent any impact on the protected areas and key biodiversity arising from their actions during the construction period;<br>• prevent workers from removing / damaging any flora and fauna found in the project area; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Contractor should ensure that a "no Poaching or fishing policy" is implemented throughout the construction period to cover on-site and off-site activities<br>• Contractor should ensure that a "No vegetation / tree damage policy" is implemented throughout the construction period to cover on-site and off-site activities;<br>• Emergency response plan must be prepared for any incident that can lead to any deleterious impact on the protected areas and key biodiversity areas. | | |
| Impact to Traffic | Road rehabilitation works will render some portions of the road unusable at periods of time resulting in traffic congestion and inconveniences to pedestrians and motorists in the vicinity of the affected area. | • Schedule road works in consultation with tourism authorities and traffic police; works that may affect the tourist places shall not be conducted during the tourist seasons<br>• Complete the works and clear the sites prior to start of peak tourist seasons;<br>• Plan roads and drain works minimizing traffic disturbance/blockades; work planning is crucial to minimize the inconvenience to public due to road works; provide diversions / alternative roads where required<br>• A Site-Specific Traffic Management Plan should be drawn up in consultation with the local community on construction operations and work schedules.;<br>• Coordinate with traffic police for temporary road diversions and for provision of traffic aids;<br>• Notify public and provide sign boards informing nature and duration of construction works and contact numbers for concerns/complaints;<br>• Maintain sufficient access to houses and shopkeepers (commercial establishments) during works; provide proper and safe pedestrian access.<br>• Awareness should be built amongst the community on the implementation of the Site-Specific Traffic Management Plan;<br>• Emergency response plan must be prepared for any traffic accident during construction and should be included in the SEMP. | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • As necessary, increase workforce for speedy completion;<br>• Schedule material deliveries on low pedestrian traffic hours;<br>• Restore damaged properties and utilities;<br>• Erect and maintain barricades if required;<br>• Pedestrian access will be maintained with the use of walking boards. Wheelchair and disabled access shall be maintained.<br>• Surfaced roads shall be subject to road cleaning and unsurfaced roads to dust suppression, the methodology and frequency of which shall be included in the SEMP.<br>• | | |
| Disruption of Public Access | Public access along the road alignments may be disrupted during construction activities. | • Prior coordination with the surrounding community on operation and work schedules.<br>• As necessary, increase workforce for speedy completion;<br>• Inform through display board about nature, duration of construction and contact for complaints;<br>• Schedule material deliveries on low pedestrian traffic hours;<br>• Restore damaged properties and utilities;<br>• Erect and maintain barricades if required;<br>• Pedestrian access will be maintained with the use of walking boards. Wheelchair and disabled access shall be maintained.<br>• Surfaced roads shall be subject to road cleaning and unsurfaced roads to dust suppression, the methodology and frequency of which shall be included in the SEMP. | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| Impact on PCR and Chance Finds | There are no notified / protected PCR near the project sites. However, in case of chance finds, impacts should be mitigated. | • Strictly follow the protocol by coordinating immediately with PIU and Nepal Department of Archaeology (NDA) for any suspicion of chance finds during excavation works;<br>• Stop work immediately to allow further investigation if any finds are suspected; and<br>• Obtain approval for the construction work from the NDA prior to commencing the work on the stretch;<br>• Carryout construction as per the terms and conditions set out in the approval;<br>• Request authorized person from the NDA to observe when excavation resumes for the identification of the potential chance finds and comply with further instructions. | Contractor | DSC, PIU, PMCDC, PCU |
| Impact on socio-economic activities | Disturbance to economic activities may result from excavation works, stockpiling, the operation of construction vehicles and equipment, and accidental damage to utilities | • Develop the construction schedule in discussions with the community so that movement of construction vehicles can be avoided during school travel timings, festival times and /or any other local events that would require local communities to travel;<br>• Implement the traffic management plan in collaboration with local authorities;<br>• Where traffic congestion will likely occur, place traffic flagmen during working hours;<br>• Avoid full road closures by applying the construction method on section-wise and/or chainage-wise approach during excavation, concreting and/or curing periods;<br>• If full road closure is not possible, especially on very narrow roads, ensure that alternate routes are identified and that affected residents and establishments are informed prior to conducting the construction activities;<br>• Provide convenient access to pedestrians when works occur in front of residential, commercial or institutional establishments. Examples are planks with handrails that should be provided to cross excavated areas.<br>• At all points of time, ensure that the local communities have, at a minimum, access to their households;<br>• Manage stockpile; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Manage pumped water from excavations either to drains or drums for later use;<br>• Relocate the affected power supply poles, and<br>• Advise the concerned authority during accidental damage to utilities. | | |
| Occupational Health and Safety | Construction activities could create health and safety risks to construction workers | • All relevant provisions of the National Health Care Waste Management Standards and Operating Procedure-2020 and relevant WHO guidelines will be adhered to, concerning the provision of adequate measures to avoid contracting and/or spreading diseases during construction phase;<br>• Follow international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities; and EHS Guidelines on Waste Management Facilities. These practices include recommended measures to prevent, minimize and control pathogens from inflicting workers through training and use of appropriate PPEs, clothing and equipment when working along the drainage system, and immunization and health monitoring;<br>• Existing drains may present hazardous working conditions in some places due to lack of oxygen and flammable nature of methane emissions which will be detrimental to the health and safety of workers. Put in place standard operating procedures with appropriate equipment, and workers are provided with necessary training and personnel protection equipment to safeguard health and safety<br>• Follow established occupational health and safety protocol on emerging infectious diseases such as the corona virus disease (COVID19).<br>• A readily available first aid unit, including an adequate supply of sterilized dressing material and appliances, will be provided as per the factory rules. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • Other first aid medical equipment and nursing staff will be made available or arranged on-call;<br>• The contractor will, at his own expense, conform to all disease prevention instructions as may be given by PCU/PIU;<br>• Provide regular health check-ups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce;<br>• The contractor shall provide at cost all labor and materials and construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications and provide personal protective equipment (PPE) to all the laborers working at the construction site;<br>• Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards;<br>• Make available first aid kits, ambulance facilities, and fire extinguishers in camp sites, if any;<br>• Compensation for the loss of life (a zero tolerance to loss of life policy should be developed and implemented) or for any type of injuries; and<br>• Provide adequate insurance to the workers that is current throughout the construction period;<br>• Conduct Health and safety training periodically and Daily Tool Box Training for all site personnel. | | |
| Community Health and Safety | Construction activities could create health and safety risks to community people. | • Code of conduct for workers includes restricting workers in designated areas, no open defecation, no littering, no firewood collection, no fire except designated places, no trespassing, no residence at construction sites, and no obligation to potentially dangerous work;<br>• Follow International best practices on community health and safety such as those in Section 4.3 of World Bank | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities.<br>• Follow established community health and safety protocol on emerging infectious diseases such as COVID19;<br>• Implement measure to prevent proliferation of vectors of diseases at work site;<br>• Maintain a complaint logbook in worker's camp and take action promptly of complaints. Follow the established GRM of the overall project (URLIP);<br>• Schedule transportation activities by avoiding peak traffic periods;<br>• Clean wheels and undercarriage of haul trucks prior to leaving construction site;<br>• Educate drivers: limit speed not more than 30 km/h in settlements and avoid use of horn;<br>• Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement;<br>• Provide prior information to local people, particularly the Temples and other places of worship nearby about work schedules;<br>• Noise barriers must be installed in between the construction site and any community halls or places of worship to reduce the noise level;<br>• Provide adequate space and lighting, temporary fences, reflectorized barriers and signages at the work site; and<br>• Ensure contractor has staff trained on emergency response. | | |
| Post-construction clean-up and reinstatement | Construction debris, spoils, and excess construction materials may pose hazards to properties, community and environment if left unattended after construction. | • Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required;<br>• All excavated roads shall be reinstated to original condition;<br>• All disrupted utilities restored;<br>• All affected structures rehabilitated/compensated; | Contractor | DSC, PIU, PMCDC, PCU |

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring/ Supervision |
| | | • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;<br>• All hardened surfaces within the construction camp area shall be ripped;<br>• All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document;<br>• The contractor must arrange the cancellation of all temporary services;<br>• Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work. | | |

**Table 14: Environmental Management Plan – Operational Phase – Pokhara Subproject**

| Parameter | Environmental Impacts | Mitigation Measures | Institutional Responsibility | |
|---|---|---|---|---|
| | | | Implementation | Monitoring / Supervision |
| Routine Maintenance | Traffic may be interrupted temporarily but this work will be very small in scale, periodic, and short in duration, so there will be no economic or other implications. Also, the environmental impacts will be much less than those during the construction period. | • To maintain the safety of workers and road-users, such work should be coordinated with the local police department so that adequate warning signs and traffic diversions can be set up when necessary<br>• Debris need to be collected and disposed at a designated site such as the landfill.<br>• Continue to encourage community participation in ensuring drainage canals are clog-free through information and behavior change campaigns and incentives, if possible. | Pokhara Metropolitan City | PCU, DUDBC |
| Community Safety | Improved roads may give way to faster vehicle speeds which could endanger people and households along the road alignments. Damage in roads may also cause accidents to motorists. | • Conduct regular inspection of the roads to check for damages, and undertake rehabilitation measures for any damages found;<br>• Inspect and maintain the integrity of road barriers, especially at critical curves or locations that are prone to vehicular accidents;<br>• Inspect and maintain speed limiters such as humps installed on road sections near residential areas, schools, and religious establishments;<br>• Inspect and maintain all road signages, including appropriate warning signages at silent zones, and ensure that these are reflectorized and visible even during night time; and<br>• Ensure pedestrian crossings are maintained. | Pokhara Metropolitan City | PCU, DUDBC |

## C. Environmental Monitoring Program

146. Monitoring of mitigation measures during construction is the responsibility of the PIU and PCU, supported by the PMCDC Environmental Specialist. However, monitoring of mitigation measures during operation phase is the responsibility of the Asset Owner. Table 15 shows the proposed Environmental Monitoring Program for this subproject, which specifies the various monitoring activities, indicating location, frequency of monitoring and responsibility.

**Table 15: Environmental Monitoring Program**

| Activities or Items to Monitor | Location | Responsible for Activities | Monitoring Method | Monitoring Frequency | Monitoring Responsibility |
|---|---|---|---|---|---|
| **PRE-CONSTRUCTION** | | | | | |
| Secure Environmental Clearance Certificate (ECC) from MoUD | PCU office | PCU, PMCDC | Copy of approved ECC | Before construction activities | PCU, PMCDC |
| IEEs and EMPs are included in bid and contract documents | PCU office | PCU, PMCDC | Copies of bid and contract documents | Before approval tender document | PCU, PMCDC |
| Site-specific EMP (SEMP) submitted by Contractor for approval by PIU | PIU office | Contractor, PIU | Copy of approved SEMP | Before construction activities commence | PCU, PMCDC |
| Spoil management plan (SMP) submitted by Contractor for approval by PIU | PIU office | Contractor, PIU | Copy of approved SMP | Before construction activities commence | PCU, PMCDC |
| Traffic management plan (TMP) submitted by Contractor for approval by PIU | PIU office | Contractor | Copy of approved TMP | Before construction activities commence | PCU, PMCDC |
| Secure all other necessary permits and licenses from relevant government agencies | | Contractor | Copies of permits and licenses | Before construction activities commence | PCU, PMCDC |
| Conduct of baseline ambient air quality and noise level monitoring | Subproject site | Contractor | Site visits and observations, Contractor records, Results of Air Quality Sampling and Noise Level measurements. | Before construction activities commence | PCU, PIU, PMCDC |
| Conduct of baseline surface water and ground water quality monitoring | Subproject site | Contractor | Site visits and observations, Contractor records, Results of | Before construction activities commence | PCU, PIU, PMCDC |

| Activities or Items to Monitor | Location | Responsible for Activities | Monitoring Method | Monitoring Frequency | Monitoring Responsibility |
|---|---|---|---|---|---|
| | | | laboratory analyses | | |
| **CONSTRUCTION** | | | | | |
| Implementation of SEMP; including implementation of community and occupational health and safety measures. | Subproject site | Contractor | Site visits, Contractor records, | Weekly or as needed | PCU, PIU, PMCDC |
| Implementation of SMP | Subproject site | Contractor | Site visits, Contractor records, | Weekly or as needed | PIU, PMCDC |
| Implementation of TMP | Subproject site | Contractor | Site visits, Contractor records, | Weekly or as needed | PIU, PMCDC |
| Tree Removal and Replacement | Subproject site and planting site | Contractor | Site visits, Contractor records, | Monthly, or as needed | PCU, PIU, PMCDC |
| Conduct of ambient air quality and noise level monitoring | Subproject site | Contractor | Site visits and observations, Contractor records, Results of laboratory analyses, Results of noise level measurements | Quarterly or as needed | PCU, PIU, PMCDC |
| Conduct of surface water quality monitoring | Subproject site | Contractor | Site visits and observations, Contractor records, Results of laboratory analyses | At least semi-annual or as needed | PCU, PIU, PMCDC |
| Develop and apply archaeological protocol to protect chance finds | Subproject site | Contractor, PCU, PIU, PMCDC | Contractor records | Once until protocol is approved | PCU, PIU, PMCDC |
| Provide EHS training for all personnel | Subproject site | Contractor | Contractor records; Interviews to workers | Monthly | PIU, PMCDC |
| Keep accident reports and records | Subproject site | Contractor | Contractor records; Interviews to workers and community people | Monthly | PIU, PMCDC |
| Employ workforce from communities near sites | Subproject site | Contractor | Contractor records | Monthly | PIU, PMCDC |

| Activities or Items to Monitor | Location | Responsible for Activities | Monitoring Method | Monitoring Frequency | Monitoring Responsibility |
|---|---|---|---|---|---|
| Implementation of EHS measures at construction camps | Construction camp site | Contractor | Site visits; Interviews to workers at camp | Monthly | PIU, PMCDC |

**Table 16: Environmental Monitoring Plan (Sampling & Analysis)**

| Monitoring field | Monitoring location | Monitoring parameters | Frequency | Responsibility | Cost & Source of Funds |
|---|---|---|---|---|---|
| Ambient air quality | 2 locations f | PM10, PM2.5, NO2, SO2, CO | Once before start of construction and quarterly (yearly 4-times) during construction | Contractor | Cost for implementation of monitoring measures responsibility of contractor |
| Ambient noise | 2 locations | Day time and night time noise levels | Once before start of construction and quarterly (yearly 4-times) during construction | Contractor | Cost for implementation of monitoring measures responsibility of contractor |
| Surface water quality | 2 locations | pH, Oil & grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity | Once before start of construction and quarterly (yearly 4-times) during construction | Contractor | Cost for implementation of monitoring measures responsibility of contractor |

## D. Capacity Development Training

147. The PMCDC Environment Specialist will be responsible for training the PCU, PIU and contractors. Training modules will need to cover safeguards awareness and management in accordance with both ADB and government requirements as specified below.

(i) sensitization on ADB's safeguard policy on environment;
(ii) introduction to environment and environmental considerations in urban infrastructures;
(iii) review of IEEs and integration into the project detailed design;
(iv) improved coordination within nodal departments; and
(v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

148. **Methodology.** Capacity building activities will be achieved through combination of practical methodologies available such as lecture and workshop training by experts, on-the-job training and mentoring, and continuing team meetings and exercises. The PMCDC Environment Specialist will spearhead the designing of specific programs appropriate for the target participants

or stakeholders, including the execution of these programs during the different implementation phases of the URLIP, which includes the subproject. Pre-training and post-training assessment will be an integral part of the overall program to measure its effectiveness, and identify any other needed interventions to improve effectiveness, if necessary.

149. As fundamental component for the capacity building program, basic lectures and seminar training sessions will be provided by the PMCDC Environment Specialist to strengthen the awareness of project stakeholders on the requirements of ADB SPS and government environmental laws, rules and regulations. Modules will be prepared and customized based on the skills set and needs of the different stakeholders. The entire training will cover basic principles of environmental assessment and management mitigation plans and programs, implementation techniques, monitoring methods and tools. A proposed lecture and seminar training program along with the frequency of sessions is presented in the following table.

**Table 17: Sample Lecture and Seminar Training Program for Environmental Management**

| Items | Pre-construction | Construction | |
|---|---|---|---|
| **Training Title** | Orientation workshop | Orientation program/ workshop for contractors and supervisory staff | Experiences and best practices sharing |
| **Purpose** | To make the participants aware of the environmental safeguard requirements of ADB and Government of Nepal and how the project will meet these requirements | To build the capacity of the staff for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and Government of Nepal | Improving implementation of EMP |
| **Contents** | Module 1: Orientation ADB Safeguards Policy Statement Government of Nepal Environmental Laws and Regulations Module 2: Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts | Roles and responsibilities of officials/contractors/consultants towards protection of the environment Environmental issues during construction Implementation of EMP Monitoring of EMP implementation Reporting requirements | Experiences on EMP implementation – issues and challenges |
| **Duration** | 1day | 1day | Best practices followed |

| Items | Pre-construction | Construction | |
|---|---|---|---|
| **Participants** | PCU and PIU staff (technical and environmental) involved in the project implementation | PCU, PIU, Contractors | PCU, PIU, Cont ractors |

## E. Environmental Management and Monitoring Plan Implementation Cost (Indicative)

Most of environmental mitigation and enhancement measures are integrated into the design and cost are included as part of the civil works contract. Some items need to be incorporated in the Bill of Quantities (BOQ) of this subproject including the environmental monitoring costs. The environmental costs presented in the table below are tentative provisions based on experience of undertaking similar works under different DUDBC projects. For the details of environmental costs under civil works contract, individual contract package bid document may be consulted. Contractors will bear the direct costs of all mitigation measures during construction, which will be included in the tender and contract documents; this includes features built into facility designs to prevent environmental impacts from arising. The PIU will bear the costs related to mitigation measures during operation. Costs related to environmental supervision during construction will be borne by the PIU, the PCU (for the activities of the environmental consultants) and by the contractors (for monitoring work carried out by the EHS Officer/s). During the operation phase, monitoring costs will be borne by the Pokhara Metropolitan City and/or the PIU.

**Table 18: Indicative Environmental Management Plan Budget for Bill of Quantities (BOQ)**

| S.No. | Description of Items | Unit | Qty | Unit of Rate | Item Total |
|---|---|---|---|---|---|
| i. | Environmental Monitoring Cost a) Air Quality, b) Noise level, and c) Water Quality | Lumpsum | 57 | NPR 4,94,000 | NPR 4,94,000 |
| ii. | Insurance Cover for the following: (a) Workmen Compensation and (b) Damages to Third Party | Lumpsum | | | Part of works contract |
| iii. | Tree Replacement (Providing, Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and placing tree guards, curing and maintenance) *Compensatory plantation as per Forest Regulations 2022-Rule 93 (5), loss of 1 tree should be compensated by planting 10 trees* | Nos.(as per actual loss of trees) | 0 | NPR 3,000 | 0 |
| iv. | **Environmental Mitigation and Enhancement Measures at Construction Sites (2 sites) and Campsites (1 site) as per below:**<br><br>-Providing and maintaining adequate potable water supply facilities at camp site and work sites<br><br>-Personal protective Equipment (PPE) | Lumpsum | | | NPR 19,00,000 |

| S.No. | Description of Items | Unit | Qty | Unit of Rate | Item Total |
|---|---|---|---|---|---|
| | -Traffic management during construction (barricade with green nets, visible warning and danger signs in construction sites)<br><br>-Dust suppression measures by spraying water (excluding watering for compaction) (3 times a day at 3 construction sites for 1.5 years excluding monsoon and planning period)<br><br>-Debris disposal and waste management on camp sites<br><br>-Restoration of ancillary sites including stockpile sites, borrow areas, workforce camp (assuming 6 locations)<br><br>-Maintain First aid box and fire extinguisher (campsite, construction site and storage site)<br><br>-Separate male and female toilet facilities<br><br>-Implementation of additional occupational health and safety measures related to prevention of COVID-19<br>Any other other measures as per EMP | | | | |
| | | | | | |
| | | | | | |
| | **Indicative Cost (Total Amount)** | | | | **NPR 23,94,000** |

# VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

## A. Consultation and Participation

150. Meaningful consultation is an essential part of the environmental assessment process which enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, and the sharing of development benefits and opportunities, and implementation issues. The process also helps avoid potential conflicts with stakeholders for smooth project implementation. The findings from the public consultations are documented and considered in the development of the EMP, especially in identifying the significant impacts of the proposed Project and developing the corresponding mitigation measures. The key stakeholders consulted were:

(i) Project beneficiaries;
(ii) Elected representatives, community leaders and representatives of community-based organizations;
(iii) Local government and relevant government agency representatives, including local authorities responsible for land acquisition, protection and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;

## B. Public Consultation Conducted

151. Consultations were conducted with key stakeholders and community members in line with ADB's requirements pertaining to environmental and social considerations. These consultations helped in identifying the felt needs, concerns and apprehensions of the communities related to the project and their priorities and likely environmental and social safeguard issues and their mitigation measures. The summary of consultation date, place and number of participants is given in the following table.

**Table 19: Summary of Public Consultation**

| S. No. | Project component | Date and Place | Persons Consulted | Number of Participant | | Key Discussion Points/Issues Raised |
|---|---|---|---|---|---|---|
| | | | | Male | Female | |
| 1 | All component | 18 & 19 April 2023 (ADB pre fact finding Mission) Two meetings | Metropolitan team and other stakeholder | 41 | 6 | Shared overall scope of the project to municipal authorities. Subproject wise discussion and prioritize 8 sub projects for project financing.<br>- Jointly observed the proposed road alignment.<br>Discussed likely issues of land resettlement. |
| 2 | All component | April 29 & 30 Safeguard consultant team 7 meetings | Metropolitan staff member, local people | 87 | 47 | During the consultation, connectivity up to Bhanjyang has been marked as high priority of local people as well as of the metropolitan.<br>Potential impact due to structures loss are identified in several sections of proposed road alignment, however |

| S. No. | Project component | Date and Place | Persons Consulted | Number of Participant | | Key Discussion Points/Issues Raised |
|---|---|---|---|---|---|---|
| | | | | Male | Female | |
| | | | | | | impacts are partial and not amounting to physical relocations.<br>During the consultation at various sections of proposed road alignment, community support was noticed in favor of the proposed road. |
| **Total Participants: 181** | | | | **128** | **53** | |

152. During the consultations, the project, its benefits, social and environmental impacts were presented to the community. The participants were encouraged to be open and make known their concerns and claims. Following are the general issues observed from the minutes of meetings of mass consultation:

(i) Project affected people expressed their willingness to provide consent for the demolition of likely affected private structures with the improvement of proposed road subprojects.
(ii) The meeting with municipality and district office of DUDBC culminated that there will not be any impact upon land, structure and livelihood due to the improvement and upgrading of the proposed road sections.
(iii) Further, the consultation meeting decided that there will not be any impact upon dalits, backward people and indigenous nationalities with its implementation.
(iv) It is further, decided that there will not be severe impact upon environment with the implementation of the road sections.

153. After the presentations, the community was given opportunity to give their views, comments, and queries. The following lists the topics, issues and concerns discussed during the consultations:

(i) Awareness of the local community about the Project;
(ii) Community benefits realized as a result of the road schemes;
(iii) Opinion of the local people about its need;
(iv) Community support and participation;
(v) Prospects of jobs and income generating activities;
(vi) Road connectivity and access;
(vii) Construction impacts such as dust and noise;
(viii) Resettlement and social issues and mitigation measures;
(ix) Roles and responsibilities of different stakeholders for realizing desired outcome; and
(x) Construction and maintenance of the roads

**Figure 19: Public Consultation in Pokhara Metropolitan City**

Meeting between Pokhara Metropolitan City and ADB Team

Consultation meeting at Ward no. 15 and 14 Airport to Lakeside Road

Consultation Meeting at Damdame-Kudbi-Sidane-Bhanjyang Road

## C. Future Consultations during Detailed Design Stage

154. Stakeholder consultations will continue during the project implementation. PCU, PIU, DSC and PMCDC will ensure that consultations will be conducted as meaningful per definition of ADB SPS, 2009. One of the key consultations that is suggested to be performed during the detailed design stage is with the Wetlands Authority within the Forest Department. The summary of IEE will be locally disclosed in an accessible place and in a form and language(s) understandable to affected people and other stakeholders before consultations to give stakeholders a chance to read it and consult experts.

## D. Information Disclosure

155. Information shall be disclosed through public consultation and making available relevant documents in public locations. The following documents will be submitted by the PCU to ADB for review and disclosure on its website. ADB will disclose upon receipt of acceptable reports and endorsement from the PCU17:

(i) IEE report (including subproject EMP);
(ii) Updated IEE (including EMP); and
(iii) Semi-Annual Environmental Monitoring Reports, and Corrective Action Plans prepared during project implementation, if any.

156. The EA/IA will send a written endorsement to ADB for disclosing these documents on the ADB website. The PIUs will provide relevant safeguard information in a timely manner, in an accessible place and in a form and language understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used. For the benefit of the community, the summary of the IEE will be translated in Nepali and made available at: (i) office of PCU; and (ii) offices of the contractors. Hard copies of the IEE report will also be available at the PCU and accessible to citizens as a means of disclosing the document and at the same time creating wider public awareness. On demand, the person seeking information can obtain a hard copy of the complete IEE document at the cost of photocopy from the office of the Project Office, on a written request and payment for the same. Electronic version of the IEE will be placed in the official website of DUDBC after approval of the documents by Government and clearance from ADB. Disclosure will follow ADB's Access to Information Policy, 2018.

[17] Per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4." Upon its receipt of acceptable safeguard documents and endorsement by PCU, ADB discloses the same on ADB website.

## VIII. GRIEVANCE REDRESS MECHANISM

157. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental, and other concerns on the project. The project adopts a three-tier GR and will ensure greater accountability of the project authorities towards affected persons. Grievances may be routed through letters, emails, text messages, verbal narration, grievance box and registers. The GRM is not intended to bypass the government's own legal process, but to provide a time-bound and transparent mechanism to resolve such concerns that is readily accessible to all segments of the affected persons and community. The aggrieved party shall be free to approach the national legal system at any given time. All costs involved in resolving the complaints (meetings, consultations, communications, and reporting/information dissemination) will be borne by the project.

158. PIU will ensure local community meetings are held to notify users and affected persons and other stakeholders about grievance redress mechanism of the project. Awareness of grievance redress procedures will be created through the public awareness campaign, with the help of print and electronic media and radio. The key functions of the GRC are to (i) provide support for affected persons or any aggrieved party to lodge their complaints; (ii) record the complaints; (iii) facilitate grievance resolution in consultation with affected persons and concerned authorities; (iv) report to the aggrieved parties about the decision/solution; and (v) forward the unresolved cases to higher levels.

159. Grievance redress committees (GRCs) will be formed at three levels viz. ward/field level, PIU level and PCO level as under:

160. **First Level GRC (Field/Ward-Level):** The contractors, PIU safeguards personnel can immediately resolve issues on-site in consultation with each other with the support of the designated municipal ward chairperson and will be required to do so within seven days of receipt of a complaint/grievance. In addition, contractors will place complaint boxes at prominent places viz. public places, contractor camp site etc. where local community members can put their complaints/grievances and contractor's personnel should be in charge to collect and process the complaints/grievances as necessary. The PIU safeguards personnel, SDC safeguards consultants and contractor can immediately resolve the complaint on site. If the grievance remains unresolved within the stipulated time, the matter will be referred to the next GRC level. The field/ward-level GRC will comprise of the following:

(i) Ward Chairperson (Committee Chairperson)
(ii) PIU Engineer
(iii) Ward Member representing vulnerable community (one women and one *janjanati* representative, if required)
(iv) Contractor's Representative
(v) SDC Safeguards Specialist
(vi) Ward Chairperson's secretary will act as complaint receiving office and provide secretarial services to GRC.

161. The ward-level GRC shall have at least one women member. For project-related grievances, representatives of affected persons, and community-based organizations will be invited as observers during GRC meetings. In case of impact on indigenous peoples, the grievance team must have representation of the affected indigenous peoples, and or CSOs/NGOs working with the indigenous peoples' groups.

162. **Second Level GRC (Municipality/PIU-Level):** Any unresolved issues at ward level will be referred to the second level GRC chaired by Mayor/Deputy Mayor. The complainant will be notified by the ward-level GRC that the grievance is forwarded to the municipality (PIU) level. All evidence submitted while lodging the complaint by the affected will also be forwarded. After proper examination and verification of the grievances, the committee will facilitate affected persons, and concerned parties to agree on a time-bound action plan to resolve the grievance if found to be valid. The GRC at this level will have to respond to its decision within 14 days of receipt of complaint from first level. The second level GRC will comprise the following:

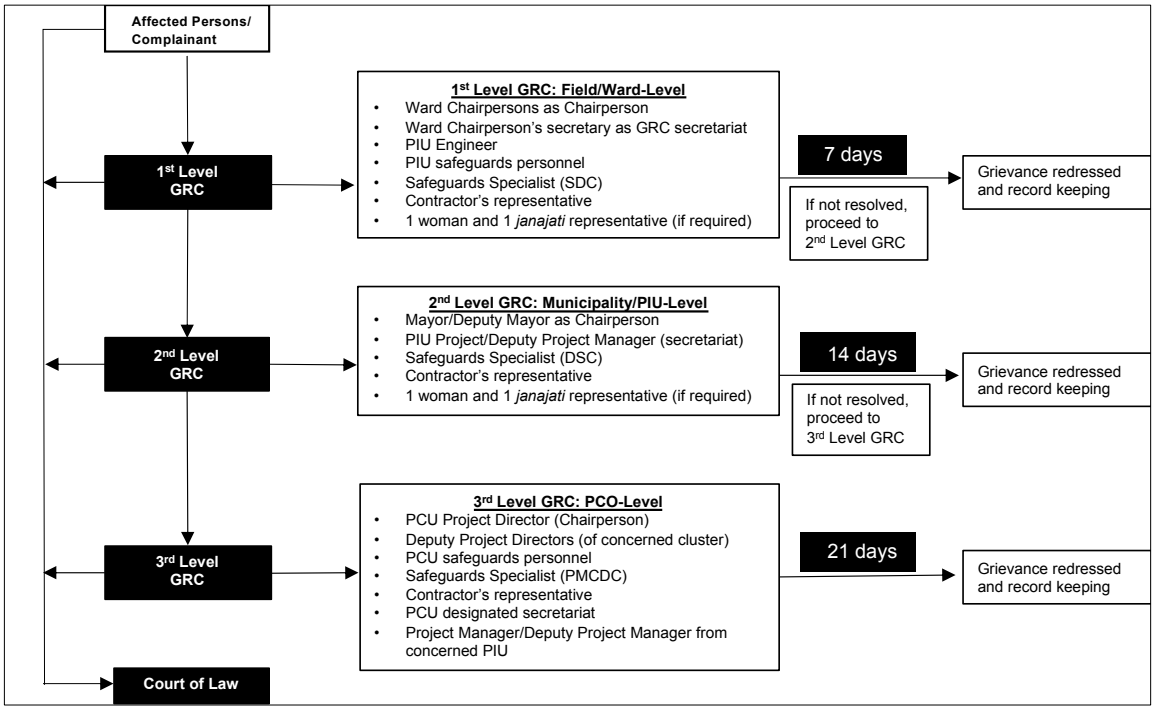
(i) Mayor/Deputy Mayor (Committee Chairperson)
(ii) PIU safeguard personnel
(iii) SDC social/environment specialist
(iv) Contractor's representative
(v) Ward member representing vulnerable community (one women and one *janjanati* representative, if required)
(vi) Project manager of the PIU will act as a secretariat.

163. **Third Level GRC (PCO-Level**): If the grievance remains unresolved within the stipulated time, the matter will be referred to the PCO level. The PIU safeguards team will refer any unresolved or major issues to the PCO-level GRC. The PCO-level will comprise the following:

(i) Project Director (Committee Chairperson)
(ii) Deputy Project Directors
(iii) PCO Safeguards Personnel
(iv) Safeguards Specialist
(v) Contractor's Representative
(vi) Project Manager/Deputy Project Manager from concerned PIU/municipality
(vii) PCO-designated personnel who will act as secretariat.

164. The grievance redress process is represented in Figure 2.

**Figure 20: Grievance Redress Procedures – URLIP**




165. **Record-keeping.** The PIU/PCO/ PMCDC will keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected and final outcome. All complaints should be signed with complete information on name, contact address, phone number if any so that the person can be contacted when required. A sample template is provided in Appendix 4. An acknowledgement to the effect that the complaint has been received by the coordinator's office should be promptly sent to the complainants. All complaints received should be first registered, categorized and prioritized. They should be analysed and assessed the concerns raised by the affected parties and have discussion and consultation with them. Records of all such proceedings should be maintained, for future reference, and the attendance of all participants with their signature, in particular the complaints and affected groups should be recorded. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PCO, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

166. **Periodic review and documentation of lessons learned**. The PCO project officers (Social and Environment) will periodically review the functioning of the GRM in each municipality and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

167. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the PCO and concerned PIU.

168. **Accountability Mechanism.** Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In

the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Nepal Resident Mission (NRM).[18] Before submitting a complaint to the Accountability Mechanism, it is necessary that an affected person makes a good faith effort to solve the problem by working with the concerned ADB operations department and/or NRM. Only after doing that, and if they are still dissatisfied, will the Accountability Mechanism consider the complaint eligible for review. The ADB Accountability Mechanism information will be included in the project-relevant information to be distributed to the affected communities, as part of the project GRM.

[18] ADB. Accountability Mechanism. https://www.adb.org/who-we-are/accountability-mechanism/main

# IX. MONITORING AND REPORTING

169. PCU will monitor the overall progress of EMP implementation of the entire URLIP through the different subproject jurisdictions, including the roads subproject in Pokhara Metropolitan City. The PCU, and PIU will undertake their respective roles in site inspections and document review to verify compliance with the EMP and SEMP, and progress toward the final outcome. The contractor will conduct day to day implementation of the SEMP.

170. The contractor will submit monthly reports to the PIU. The monthly reports will include compilation of copies of monitoring sheets accomplished and duly signed by the contractor's EHS Supervisor on a daily basis. This monitoring sheet is indicative which can be further enhanced depending on the actual situations at subproject construction site.

171. The PIU will submit quarterly environmental monitoring reports to PCU, which will include summary of monthly monitoring activities of contractor and results of any independent monitoring or inspection activities of the PIU. In the conduct of these independent inspection activities, PIU will be supported by PMCDC in this regard. A sample inspection checklist is in **Appendix 4**. This checklist is indicative which can be further enhanced depending on the actual situations at subproject construction site.

172. PCU shall consolidate quarterly reports from the PIUs including PIU in Tilottama Municipality, and results of its independent monitoring or inspection activities. PCU shall accomplish semi-annual environmental monitoring report (SEMRs) starting from the effectivity date up to the end of construction phase, which shall be submitted to ADB for review and disclosure on ADB website. The PCU shall prepare and submit annual environmental monitoring report during the operation phase until ADB issues a project completion report. Submission of these reports to ADB will be within thirty (30) days from the end date of reporting period.

# X. CONCLUSION AND RECOMMENDATION

173. The process described in this document has assessed the environmental impacts of all elements of the roads and drainage subproject proposed in the town of Pokhara under the ADB funded Urban Resilience and Livability Improvement Program (URLIP). The Pokhara Subproject involves implementing two road projects viz., International Airport to Lakeside Fast-Track Road (called Airport-Lakeside Link Road hereafter) and Damdame – Kudbi – Sidane - Bhanjyang Road (called Panchase Road hereafter). The infrastructure improvements cover 21.18kms of roads and drains under the two subprojects.

174. All potential impacts were identified in relation to planning / design, pre-construction, construction, and operation phases. Potential environmental impacts were assessed based on secondary data, stakeholder consultations, and field visits. The Airport to Lakeside Link Road is built on a flat terrain. The road currently has a single-lane operational paved carriageway and does not segregate slow-moving vehicles and pedestrians. The road section requires capacity augmentation, pavement reconstruction and improve drainage network to maintain acceptable levels of service. The Panchase Road is built on a mountainous terrain and passes through agricultural fields in the valleys and forests along the hillside. The Panchase Road experiences a lot of tourist traffic and a number of homestays are located along the route to the Banjyang. Pacnahse road is identified as landslide prone area, and design measures should be included to address the issues, and is provided in EMP.

175. A reconnaissance tree survey carried out along the road sections reveal that there is no major impact on trees along the two road stretches. There are a few sacred Peepal (*Ficus religiosa*) trees, along the International Airport to Lakeside Road, that needs to be preserved. Innovative road and drain designs will be adopted locally to save the Peepal (*Ficus religiosa*) trees. Along the Panchase Road, there are no trees that will be impacted. Lake Cluster of Pokhara Valley, a designated Ramsar Site, is located within Pokhara, and nearest project site is 500 m. The alignment and the design of the two subprojects ensures that there are no impacts on any of the protected areas or the key biodiversity areas. Measures suggested to avoid any impacts due to construction works. The existing Panchase road is earthen road and during the rainy season, it contributes to the sediment load of the streams and the connecting lake clusters. This will be avoided once the project road is completed.

Road improvements in the proposed subproject are combined with drainage improvement, and necessary lateral drains and cross drainage structures will be constructed. During the detailed design, local hydrology will be further assessed and accordingly the designs of the drainage system should be finalized to mitigate water logging and the flooding on project roads. There are no trees within the proposed roads right of way and therefore the project does not impact any trees or other vegetation.

Most of the predicted impacts are during construction. Road and drain will be conducted on the public roads (airport road) in urban areas, some of which are congested with people, activities and traffic, and therefore likely to significant impacts during construction. Panchase is a road connecting to nearby habitations. Pokhara being a famous tourist place, attract large number of tourists. Appropriate measures are included in the EMP. Various precautionary measures suggested to avoid impacts on Ramsar lake and the flora and fauna during construction works. Construction-related impacts include noise, dust, construction waste generation, disturbance to residents, businesses, traffic by the construction work, construction material sourcing, hauling of material and equipment, and occupational and community health and safety risks including the

spread of COVID-19, among others. These are localized and temporary and can be readily mitigated through the measures indicated in the EMP.

176. During the project operation phase, roads and drains are not expected to have any significant impacts. Regular maintenance will be ensured to avoid operational issues. Drains will be regularly cleaned, and awareness programs will be conducted to prevent disposal of solid and liquid waste into the road side drains.

177. An Environmental Management Plan (EMP) that defines the mitigation measures to be implemented across all project phases, the institutions responsible for its implementation and monitoring has been developed. One of the key mitigation measures include the designing the Panchase Road to prevent landslides in the region. Additionally, an Environmental Monitoring Program has been incorporated as part of the EMP to measure the impact of the project on the environmental media viz., air, noise, water, groundwater during the construction period.

178. The EMP will assist the PMU, PIU, Consultant and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed project. The EMP will also ensure efficient lines of communication between PIU/ULB, PMU, consultants and contractor. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site, and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

179. Public consultation was conducted as part of the environmental assessment process. The stakeholders expressed support for the proposed subproject site. Results of the consultation were documented and considered in the formulation of the project and environmental management plan. Public consultation will continue throughout the project implementation. And, one consultation is being suggested to be carried out during the Detailed Design Stage with the Wetlands Authority and NGOs working in the area of conservation / protection of wetlands ecosystem. The IEE will be made available at public locations and will be disclosed to a wider audience via the PCU and ADB websites.

180. The project's Grievance Redress Mechanism (GRM) will provide the citizens with a platform for redress of their grievances, and describes the channels, time frame, and mechanisms for resolving complaints about environmental performance.

181. PCU and PIU, with support from DSC and PMCDC, will be responsible for monitoring the project implementation and compliance with the EMP. Also, the periodic reporting requirements would enable meeting the disclosure needs as per ADB SPS 2009, as well.

182. The Pokhara Subproject will result in key environmental benefits such as, but not limited to, improved road and pedestrian safety to users resulting from improved road infrastructure and drainage facilities. One of the significant benefits from the project is the decrease in sediment load to the Lake Cluster of Pokhara during the rainy season arising from the asphalting of the earthen road which presently contribute to a lot of sediment load to the lake clusters downstream and impacts the wetlands ecosystem. The subproject is unlikely to cause any significant adverse impacts to environment and community. And potential negative environmental impacts associated with construction and operation are being mitigated through proper engineering practice, incorporation of recommended mitigation measures in the EMP and implementing the same effectively.

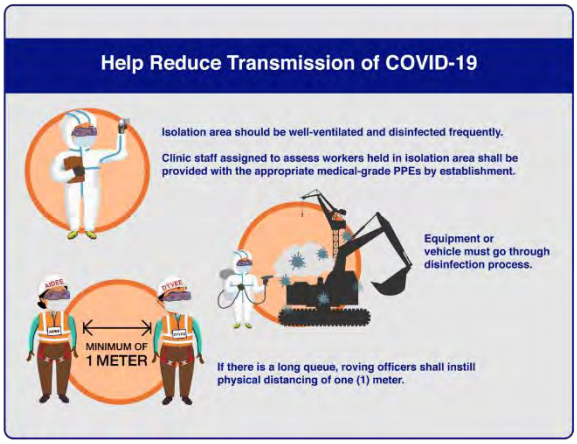
183. Therefore, as per ADB SPS, 2009, this subproject is classified as environmental category B and does not require further environmental impact assessment. This IEE has been prepared based on preliminary designs of the subproject. The PCU, with support from PMCDC, shall update this draft IEE based on final detailed design and submit to ADB for review, clearance and disclosure. To conform to government guidelines, subproject components require environmental clearance from the Ministry of Urban Development. This will be obtained prior to invitation of bids.

184. **Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impacts:

(i) Obtain all statutory clearances timely
(ii) Include this IEE in bid and contract documents;
(iii) Incorporate landslide prevention measures in Road and Drainage Designs, especially along Panchase Road;
(iv) Incorporate appropriate drainage designs along both the road sections to prevent flooding impacts;
(v) Ensure the protection of the protected areas, key biodiversity areas and wetlands present near the project areas through appropriate designs and implementation of recommended mitigation measures during both construction and operational phases of the project;
(vi) Update/revise this IEE based on detailed design and/or, change in scope, alignment, or location;
(vii) Conduct safeguards induction to the contractor upon award of contract;
(viii) Strictly supervise EMP implementation;
(ix) Ensure contractor appointed qualified EHS supervisor prior to start of works;
(x) Documentation and reporting on a regular basis as indicated in the IEE;
(xi) Continuous consultations with stakeholders;
(xii) Timely disclosure of information and establishment of grievance redressal mechanism (GRM);
(xiii) Involvement of contractors, including subcontractors, in first level GRM; and
(xiv) Commitment from PMU, PIUs, Project Consultants, and Contractors to protect the environment and the people from any impact during project implementation.

## Appendix 1: COVID 19 Guideline

### A. PREPARATION BEFORE WORK




- Worksite and camp will be secured with gated fence
- Photo Identity Card will be issued to all workers with unique identification number
- Preparation will be made for daily medical screening (thermal check and symptoms assessment) of all workers and report to H&SO
- COVID Marshal will measure temperature by wearing facemask and gloves for their gang of workers before leaving camp
- Worker with high fever and frequent cough will not be allowed to work. The worker will be asked to stay in quarantine (for residential worker) or sent back home (non-residential worker).

| **COVID-19 लक्षणहरू** | | |
|---|---|---|
| **सबैभन्दासामान्यलक्षणहरू:**<br>– ज्वरोआउने<br>– सुक्खाखोकीलाग्ने<br>– थकाइलाग्ने | **सामान्यतयाकमैदेखिनेलक्षणहरू:**<br>– पीडाहुनेवादुख्ने<br>– घाँटीदुख्ने<br>– पखालालाग्ने<br>– आँखापोल्ने<br>– टाउकोदुख्ने<br>– स्वादवागन्धथाहानहुने<br>– छालामादागहुनेवाहातवाखुट्टाकाऔँलाकोरङउड्ने | **गम्भीरलक्षणहरू:**<br>– सासफेर्नगाह्रोहुनेवापटकपटकसासफेर्नुपर्ने<br>– छातीदुख्नेवाछातीमादबाबपर्ने<br>– बोल्नवाहिँडडुलगर्ननसक्ने<br>– |
| **तपाईंमागम्भीरलक्षणहरूदेखिएमातुरुन्तैचिकित्साजाँचगराउनुहोस्।**<br>**जहिलेपनिआफ्नोडाक्टरवास्वास्थ्यसुविधाप्रदायककहाँजानुअघिकलगर्नुहोस्** | | |

- COVID Test (PCR Test) will be conducted for thestaff and workerswho have the symptom related to covid-19 (if required)
- Register record will be maintained

- Quarantine and isolation tents will be established at sufficient distance in the camp from regular shelters
- Specific and separate worksite will be assigned to the new group of workers away from regular workers for a minimum of 14 days to minimize risk
- Work will be arranged in shifts to avoid crowding of workers. Teams will be divided based on (i) workers residing in the same camp (ii) workers residing outside the camp (iii) new group of workers etc.
- Consumption of liquor and chewable like Khaini, Surti, Paan etc. (those generating urge for frequent spitting) will be strictly restricted inside office and work areas

**B. PROCEDURE AT ENTRY**


- Guards will be oriented by the H&SO on (i) checking temperature, (ii) observing health symptoms, (iii) record personal details and travel history, and (iv) taking emergency procedure, if required
- Unauthorized person and visitors will not be allowed to enter
- All new group of workers will be allowed to enter the site only after showing COVID Test certificate from authorized government hospital issued within the last 7 days, which will be checked by the Assistant Health Worker at the Medical Center
- Guards will wear prescribed PPEs at all the times and regularly disinfect their hand
- Visitor having COVID symptoms will be sent back, and immediately call HW from Medical Center for staff and worker showing symptoms
- Personnel should maintain a distance of 1 meter at all times following the floor-marking wherever queue is required
- Guard will direct vehicles supplying materials to the delivery zone

Guard will inform the visitors on fulltime use of mask and hand washing/sanitizing

**C. MINIMIZEWORKER AND COMMUNITY CONTACT**

The Contractor will be fully responsible to ensure taking all preventive measures and safety precautions for COVID-19 risks such as following:

- Project Manager will work closely with the Site In-charge and Resident Engineer for planning special measures and expedite work implementation at high risk areas and areas requiring work in close proximity with the communities
- Physical barricades will be made mandatory to separate and minimize contact between workers and local people
- Arrangements will be made to minimize movement of workers from barricaded work areas and camps and visiting settlement areas

- Work sites will be separated into working zones to keep the groups of workers physically separated. Not more than 20 workers will be allowed to work in one group. A group leader will be identified as COVID Marshal and given orientation to keep close watch of workers and trigger emergency protocol in emergency case

- Emphasis will be given to establish sufficient size of labor camp to keep all workers inside the camp to minimize contact with community.

**D. TRAVEL TO WORK SITE**

The workers will observe precaution and the contractor will arrange following measures for arranging transport for workers to the worksite:

- Travel between sites and labor camps will be arranged through official vehicle

- All workers will wear facemask when travelling in a shared vehicle, including the driver who will wear mask and glove

- Driver will sanitize had regularly and before & after every trip

- Only 40% capacity of vehicle will be used and a seat will be kept empty in between passengers

- Windows will be opened for natural ventilation

- Workers will stay facing away from each other while in the vehicle

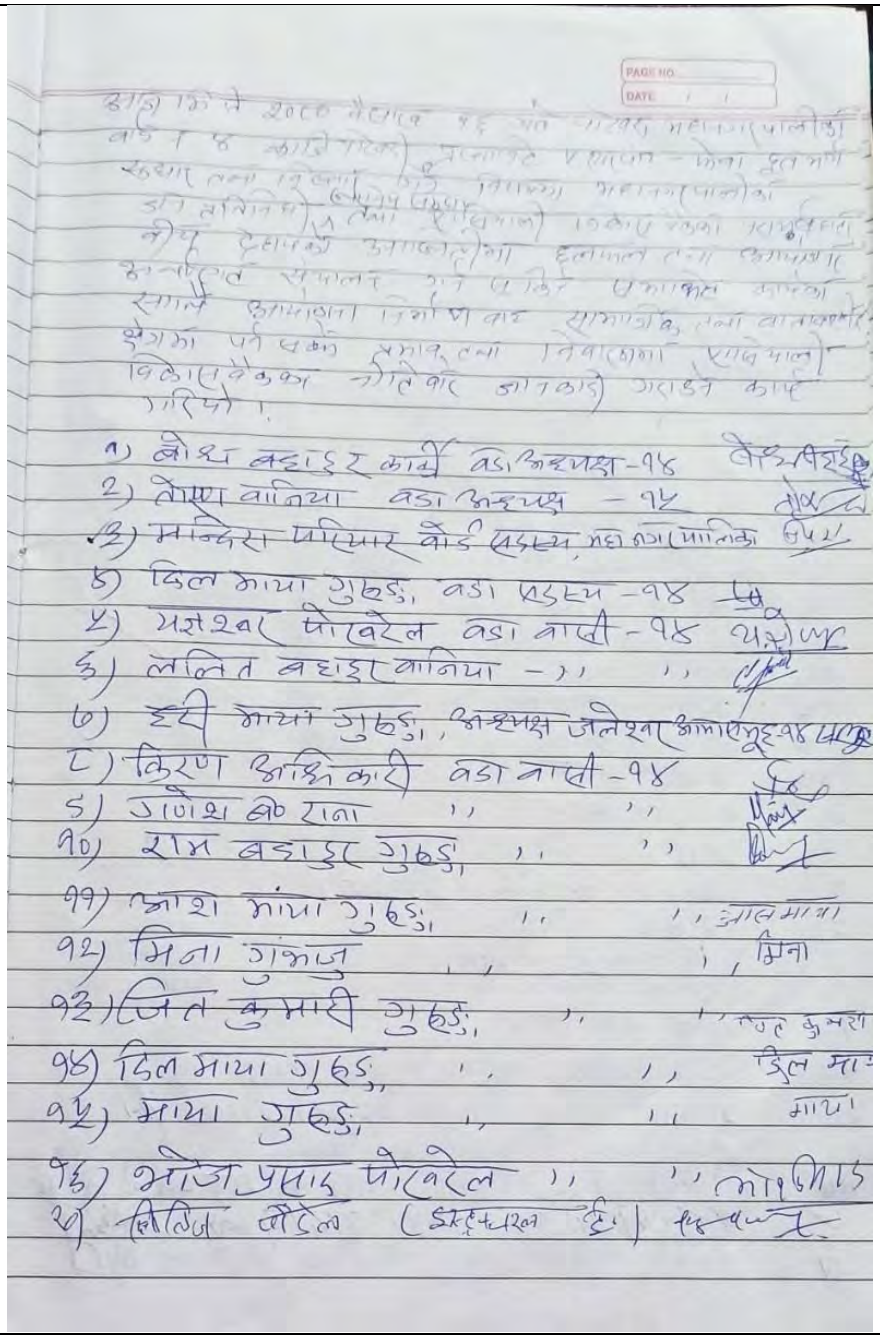
- Vehicle will be cleaned and disinfected thoroughly after every shift- with emphasis on handles, steering wheel, gear etc.

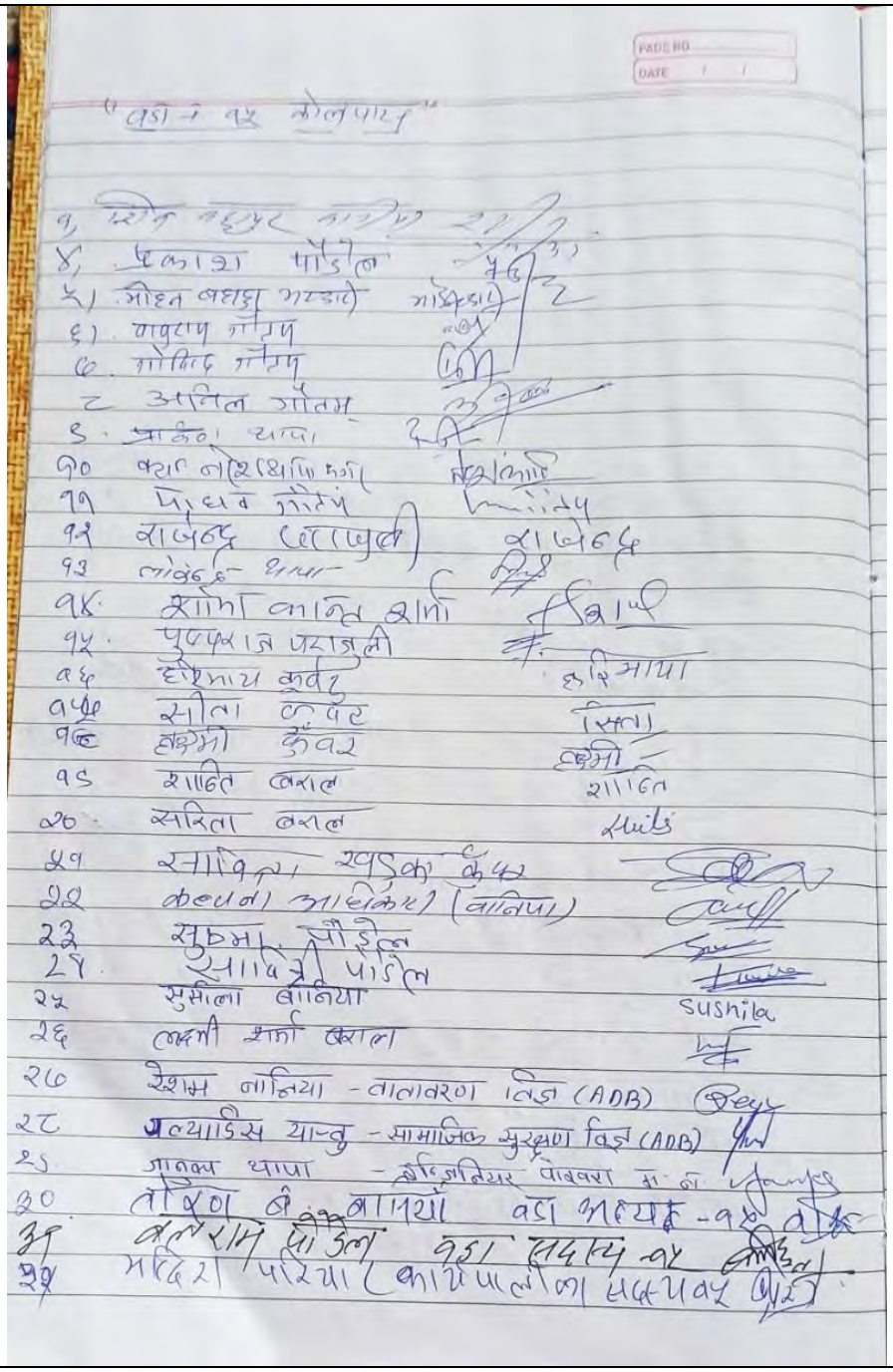
- All workers prior to entering the vehicle and exiting will sanitize their hands

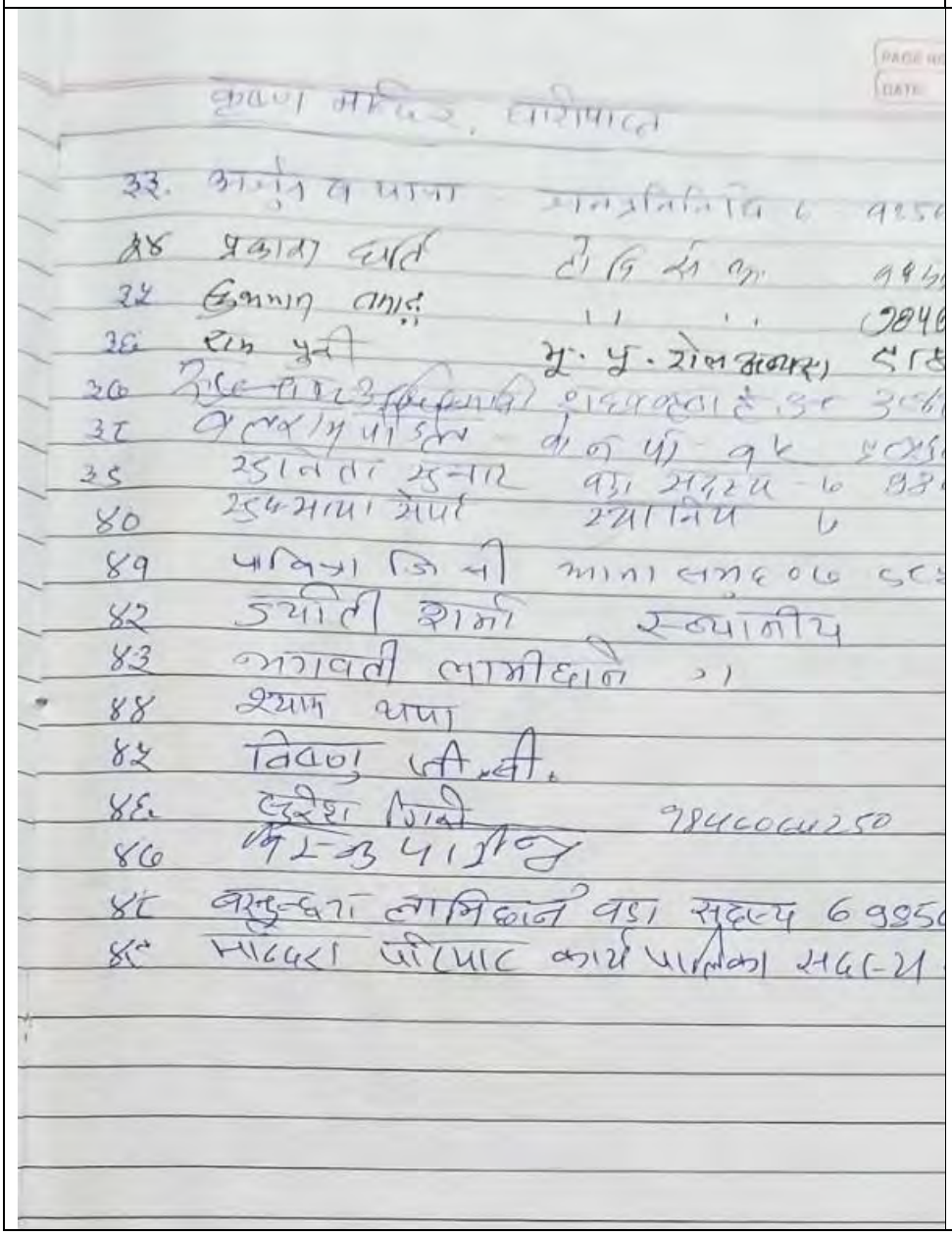
- Prior to entering the vehicles all nonresidential staff and workers must self-certify that they do not have any COVID-19 symptoms

## Appendix 2: Minutes of Consultation at Pokhara Projects

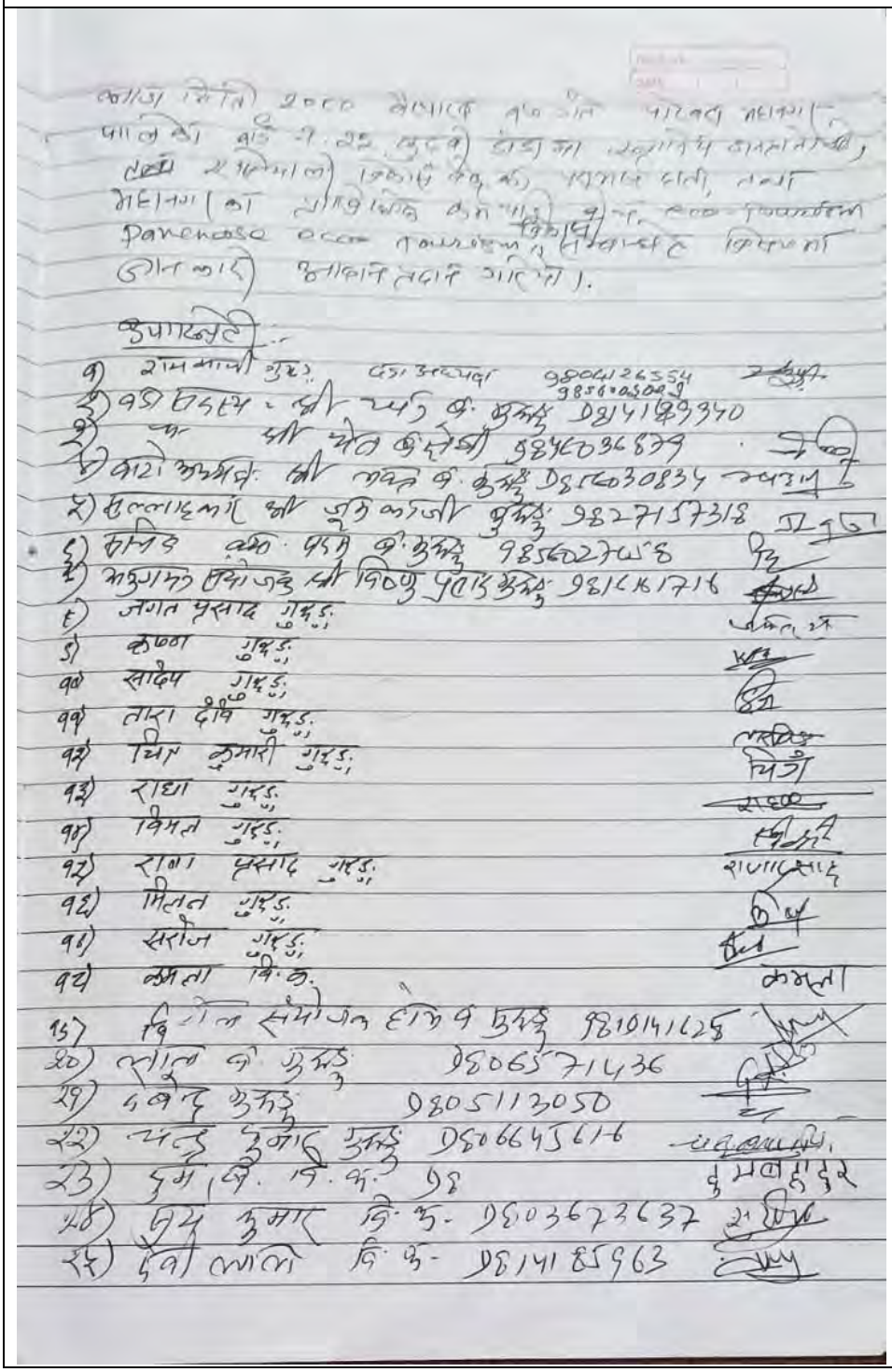
**International airport to Lakeside Road**

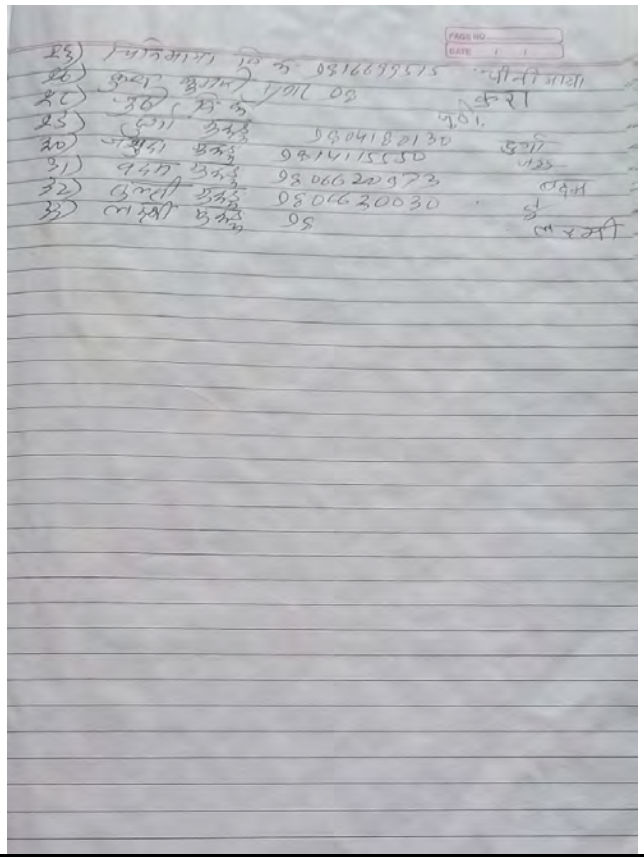
| Copy of the Minutes of the Meeting | Details of the Meetings/Consultation |
|---|---|
|  | Date: 29 April 2023<br><br>Place: Head section of Proposed Airport-Phewa Lake Road<br><br>Attendence: 17 ( 8 Female)<br>- Ward Chair<br>- Local people<br><br>Key discission/observation<br>- Observation of proposed site<br>- Shared ADB rsafeguard requiremetns to local people lekely to be affected by the road project |
| | |

| Copy of the Minutes of the Meeting | Details of the Meetings/Consultation |
|---|---|
|  | Date: 29 April 2023<br><br>Place: Middle section of Proposed Airport-Phewa Lake Road<br><br>Attendence: 32 ( 12 Female)<br>- Ward Chair<br>- Local people<br><br>Key discission/observation<br>- Observation of proposed site<br>Shared ADB rsafeguard requiremetns to local people lekely to be affected by the road project |

| Copy of the Minutes of the Meeting | Details of the Meetings/Consultation |
|---|---|
|  | Date: 29 April 2023<br><br>Place: Tail section of the Proposed Airport-Phewa Lake Road<br><br>Attendence: 17 ( 7 Female)<br>- Ward Chair<br>- Local people<br><br>Key discission/observation<br>- Observation of proposed site<br>- Shared ADB rsafeguard requiremetns to local people lekely to be affected by the road project |

**Damdame- Kudbi-Sidane-Bhanjyang Road**

| Copy of the Minutes of the Meeting | Details of the Meetings/Consultation |
|---|---|
|  | Date: 30 April 2023<br><br>Place: Khudbi Dana<br><br>Attendence: 33 ( 10 Female)<br>- Local people<br>- Ward Chair<br>- Chair of road managemetn committee<br><br>Key discission/observation<br>- Observation of proposed road alignment<br>- Shared ADB rsafeguard requiremetns to local people lekely to be affected by the road project |

| Copy of the Minutes of the Meeting | Details of the Meetings/Consultation |
|---|---|
|  | Date: 30 April 2023<br><br>Place: Khudbi Dana<br><br>Attendence: 33 ( 10 Female)<br>- Local people<br>- Ward Chair<br>- Chair of road managemetn committee<br><br>Key discission/observation<br>- Observation of proposed road alignment<br>- Shared ADB rsafeguard requiremetns to local people lekely to be affected by the road project |

## Appendix 3: Sample Grievance Registration Form

(To be available in Nepali and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

| | | | | | |
|---|---|---|---|---|---|
| Date | Place of registration | Project Town<br><br>Project: | | | |
| Contact information/personal details | | | | | |
| Name | | Gender | * Male<br>* Female | Age | |
| Home address | | | | | |
| Place | | | | | |
| Phone no. | | | | | |
| E-mail | | | | | |
| Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below:<br><br>If included as attachment/note/letter, please tick here: | | | | | |
| How do you want us to reach you for feedback or update on your comment/grievance? | | | | | |

**FOR OFFICIAL USE ONLY**

| | |
|---|---|
| Registered by: (Name of official registering grievance) | |
| Mode of communication:<br>Note/letter<br>E-mail<br>Verbal/telephonic | |
| Reviewed by: (Names/positions of officials reviewing grievance) | |
| Action taken: | |
| Whether action taken disclosed: | Yes<br>No |
| Means of disclosure: | |

## Appendix 4: Sample Environmental Site Inspection Report

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER:
_____

| | | |
|---|---|---|
| Project Activity Stage | Survey | |
| | Design | |
| | Implementation | |
| | Pre-Commissioning | |
| | Guarantee Period | |

| MONITORING ITEMS | COMPLIANCE |
|---|---|
| **Compliance marked as Yes / No / Not applicable (NA) / Partially Implemented (PI)** | |
| EHS supervisor appointed by contractor and available on site | |
| Construction site management plan (spoils, safety, schedule, equipment etc.,) prepared | |
| Traffic management plan prepared | |
| Dust is under control | |
| Excavated soil properly placed within minimum space | |
| Construction area is confined; no traffic/pedestrian entry observed | |
| Surplus soil/debris/waste is disposed without delay | |
| Construction material (sand/gravel/aggregate) brought to site as & when required only | |
| Tarpaulins used to cover sand & other loose material when transported by vehicles | |
| After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site | |
| No chance finds encountered during excavation | |
| Work is planned in consultation with traffic police | |
| Work is not being conducted during heavy traffic | |
| Work at a stretch is completed within a day (excavation, pipe laying & backfilling) | |
| Pipe trenches are not kept open unduly | |
| Road is not completely closed; work is conducted on edge; at least one line is kept open | |
| Road is closed; alternative route provided & public informed, information board provided | |
| Pedestrian access to houses is not blocked due to pipe laying | |
| Spaces left in between trenches for access | |
| Wooden planks/metal sheets provided across trench for pedestrian | |
| No public/unauthorized entry observed in work site | |

| MONITORING ITEMS | COMPLIANCE |
|---|---|
| Children safety measures (barricades, security) in place at works in residential areas | |
| Prior public information provided about the work, schedule and disturbances | |
| Caution/warning board provided on site | |
| Guards with red flag provided during work at busy roads | |
| Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc) | |
| Workers conducting or near heavy noise work is provided with ear muffs | |
| Contractor is following standard & safe construction practices | |
| Deep excavation is conducted with land slip/protection measures | |
| First aid facilities are available on site and workers informed | |
| Drinking water provided at the site | |
| Toilet facility provided at the site | |
| Separate toilet facility is provided for women workers | |
| Workers camps are maintained cleanly | |
| Adequate toilet & bath facilities provided | |
| Contractor employed local workers as far as possible | |
| Workers camp set up with the permission of PIU | |
| Adequate housing provided | |
| Sufficient water provided for drinking/washing/bath | |
| No noisy work is conducted in the nights | |
| Local people informed of noisy work | |
| No blasting activity conducted | |
| Pneumatic drills or other equipment creating vibration is not used near old/risky buildings | |

Signature

_____

**Sign off**

_____ _____

**Name** **Name**
**Position** **Position**