EXECUTIVE SUMMARY

of

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

for

PUBLIC DISCLOSURE

Project: Proposed Bridge Improvement in Uttarakhand (BIIU)

Borrower/Client: Government of Uttarakhand – Public Works Department (PWD)

Financial Assistance by: Asian Development Bank (ADB)

Environmental Safeguard Framework: ADB Safeguard Policy Statement (SPS), 2009

Project Background and Key Outputs

1. The Government of Uttarakhand, through the Public Works Department (PWD), has requested financial assistance from the Asian Development Bank (ADB) for implementation of the Bridge Improvement in Uttarakhand (BIIU) Project. The Project aims to improve the safety, capacity, reliability, and climate resilience of the state's transportation network through reconstruction, upgrading, retrofitting, and replacement of aging bridge infrastructure together with stabilization of critical landslide-prone road corridors. The Project adopts a "Build Back Better" approach and integrates climate-resilient and disaster resilient engineering measures to strengthen transport connectivity, improve road safety, reduce disruption caused by natural hazards, and support sustainable economic development across Uttarakhand. The project will have the following outputs:

   Output 1: Reconstruction of existing 222 single-lane Class B loading bridges, including approach roads, to 1.5/2 lane Class A loading standards.
   Output 2: Retrofitting and structural strengthening of existing 13 Class B loading bridges to meet Class A loading requirements.
   Output 3: Implementation of slope protection and stabilization in 8 landslide zones.
   Output 4: Strengthening the institutional capacity building.

Geographical Area of the Project

2. The BIIU Project is proposed across nine districts of Uttarakhand namely Almora, Bageshwar, Champawat, Nainital, Udham Singh Nagar, Pauri Garhwal, Tehri Garhwal, Rudraprayag, and Dehradun. The Project includes approximately 235 bridge improvement subprojects together with 8 landslide stabilization zones distributed across diverse physiographic and environmental settings including Himalayan mountain ranges, river valleys, forested landscapes, agricultural areas, and rural settlements.

Environmental Categorisation

3. Environmental screening and categorization were undertaken using ADB's Rapid Environmental Assessment (REA) process together with GIS-based analysis, site inspections, and environmental risk assessment. Considering the sector lending modality, large number of geographically dispersed interventions, environmentally

sensitive Himalayan setting, presence of forest areas, river systems, biodiversity-sensitive habitats, and potential cumulative environmental impacts, the overall BIIU Project has been classified as Category A in accordance with ADB Safeguard Policy Statement (SPS), 2009.

4. Detailed environmental due diligence has been undertaken for six representative sample subprojects comprising five bridge subprojects and one landslide stabilization zone. These sample sites were selected to represent the range of environmental, hydrological, geological, biodiversity, and social conditions likely to be encountered across the broader project portfolio. The findings from these assessments provide the basis for identifying environmental risks, developing mitigation measures, and establishing safeguard requirements for future subprojects under the Project.

Environmental Management and Mitigation Measures

5. Although most bridge reconstruction and landslide stabilization interventions are expected to generate localized and manageable environmental impacts, the sector-wide nature of the Project requires adoption of a precautionary approach. The Environmental Assessment and Review Framework (EARF) prepared under the Project establishes procedures for environmental screening, categorization, climate risk assessment, biodiversity assessment, stakeholder consultation, safeguard documentation, disclosure, monitoring, and compliance for all future subprojects.

6. This EIA has been prepared based on detailed engineering designs, field investigations, baseline environmental monitoring, biodiversity assessments, Critical Habitat Assessment (CHA), stakeholder consultations, and environmental risk assessments undertaken for the selected sample subprojects. The assessment does not cover future subprojects individually; these shall be screened and assessed during implementation in accordance with the EARF and ADB SPS (2009).

Statutory Approvals and Permissions

7. The Project does not involve activities requiring environmental clearance under the EIA Notification, 2006. However, certain bridge subprojects require forest land diversion, tree felling permissions, no objection certificate from State Disaster Management Authority, utility shifting, quarry and borrow area permits, and other statutory clearances. All required approvals shall be obtained prior to commencement of construction activities. The status of forest and tree-cutting permissions has been reviewed for the representative sample subprojects during due diligence.

Geological and Environmental conditions of Uttarakhand

8. Uttarakhand covers approximately 53,483 km² and is characterized by rugged Himalayan terrain, deep river valleys, steep slopes, fragile geology, active drainage systems, and high seismicity. Approximately 86% of the state comprises mountainous terrain and nearly 71% is under forest cover. The state's transport infrastructure is highly vulnerable to landslides, flash floods, cloudbursts, debris flows, river erosion, and earthquakes, making climate resilient bridge infrastructure a strategic necessity.

Baseline Environmental Conditions

9. Baseline environmental investigations were undertaken for the representative sample subprojects covering physical, biological, and socio-economic environments. The project area is characterized by steep Himalayan terrain, active river systems and streams, unstable slopes, forested landscapes, agricultural land, and dispersed rural settlements. Ambient air quality, noise levels, surface water quality, and soil quality generally comply with applicable national standards. However, several sample subprojects are located near environmentally sensitive receptors including rivers, streams, forest areas, community facilities, and landslide-prone slopes, requiring enhanced environmental management during project implementation.

10. Biodiversity assessments undertaken for the sample subprojects identified a range of terrestrial and aquatic habitats within the project influence areas. Ecological receptors include riverine ecosystems, forest habitats, riparian vegetation, and species of conservation importance associated with the Himalayan landscape. Several project locations occur near forest areas and ecologically important aquatic systems supporting native fish species, including Golden Mahseer (Tor putitora) an Endangered species. Although the anticipated impacts are localized. Construction activities may result in temporary habitat disturbance, vegetation loss, increased sedimentation, and disturbance to wildlife which will be mitigate through appropriate mitigation measures during implementation.

11. A Critical Habitat Assessment (CHA) was undertaken for environmentally sensitive sample subprojects in accordance with the requirements of ADB SPS (2009) and guided by IFC Performance Standard 6. The assessment included review of protected areas, wildlife habitats, aquatic ecosystems, threatened species records, and biodiversity values within the area of influence. While no critical habitat was confirmed based on the assessment criteria, several biodiversity receptors of conservation importance were identified, warranting adoption of a precautionary approach and implementation of a Biodiversity Action Plan (BAP) to avoid, minimize, and monitor potential biodiversity impacts.

Environmental Impacts and Mitigation Measures

12. Environmental assessment disclosed that the Project will generate substantial long-term positive benefits through improved transport connectivity, enhanced road safety, increased bridge load-carrying capacity, reduced travel time, reduce traffic jam, improved climate resilience, and better access to healthcare, education, tourism, pilgrimage destinations, markets, and emergency services. However, bridge reconstruction, retrofitting, and landslide stabilization activities may result in moderate environmental and occupational health and safety risks during construction. Key impacts include vegetation clearance, excavation and slope disturbance, erosion and sedimentation, spoil generation and disposal, dust and noise emissions, traffic disruption, occupational accidents, community safety risks, and temporary impacts on local drainage systems and access routes.

13. Several subprojects are located in environmentally sensitive settings including forest areas, river and stream crossings, steep Himalayan slopes, landslide-prone terrain, and habitats supporting aquatic and terrestrial biodiversity. Construction activities undertaken within or adjacent to watercourses may result in increased turbidity, sediment transport, disturbance to aquatic habitats, and localized deterioration of water quality which will be mitigated through appropriate mitigation measues. Similarly, slope stabilization works involve excavation, rock scaling, drilling, anchoring, retaining structures, and bioengineering measures that may temporarily increase risks related to slope instability, rockfall, spoil generation, and worker safety. Construction camps, equipment operation, material transportation, and temporary traffic diversions may also affect nearby communities and sensitive receptors.

14. Considering the sector-wide nature of the Project, the large number of geographically dispersed interventions, environmentally sensitive locations, and potential cumulative impacts, the overall environmental risk profile of the BIIU Project is considered moderate to substantial in the absence of mitigation. Accordingly, the Project has adopted a precautionary safeguard approach. Comprehensive mitigation measures have been incorporated into project design and are further detailed in the Environmental Management Plan (EMP), Biodiversity Action Plan (BAP), Occupational Health and Safety Plan, Traffic Management Plan, Emergency Response Plan, and site-specific Construction Environmental and Social Management Plans (C-ESMPs). With effective implementation of these measures, environmental impacts are expected to remain site-specific, temporary, reversible, and manageable.

Grievance Redressal Mechanism

15. A three-tier Grievance Redress Mechanism (GRM) has been established to facilitate timely resolution of complaints and concerns related to project implementation. The GRM will operate at contractor, PIU, and PMU levels and will remain accessible to affected persons throughout the project lifecycle. The mechanism will not restrict access to judicial remedies or ADB's Accountability Mechanism.

Conclusion

16. Based on the EIA findings, the project is classified as Category A under ADB’s Safeguard Policy Statement (SPS, 2009). This EIA satisfies ADB’s environmental assessment requirements, and no additional environmental study is required at this stage. However, as the current EIA and EMP are based on existing site conditions and available designs, they will be updated by the PMU during implementation to reflect any changes in design, scope, or location of activities, and to incorporate findings from additional field assessments, stakeholder consultations, and impact analyses. Updates will also address unanticipated impacts, revised environmental baselines, and any new mitigation or monitoring measures. The updated EIA will be submitted by the PMU and reviewed by ADB before construction begins, ensuring continued compliance with ADB SPS (2009) and national environmental regulations, and enabling adaptive environmental management throughout implementation.