Environmental Assessment and Review Framework

Project Number: 47229
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India: Uttarakhand Emergency Assistance Project

Prepared by Government of Uttarakhand for the Asian Development Bank (ADB).

ABBREVIATIONS

ADB	–	Asian Development Bank
CPCB	-	Central Pollution Control Board
DOT	-	Department of Tourism
DSC	-	design and supervision consultant
EA	-	executing agency
EAL	-	emergency assistance loan
EARF	–	environmental assessment and review framework
EAG	–	environmental assessment guidelines
EIA	–	environmental impact assessment
EMMP	–	environmental management and monitoring plan
GMVN	-	Garhwal Mandal Vikas Nigam
GOI	-	Government of India
GOU	-	Government of Uttarakhand
IA	-	implementing agency
IEE	–	initial environmental examination
JRDNA	-	joint rapid damage and needs assessment
KMVN	-	Kumaon Mandal Vikas Nigam
MOEF	–	Ministry of Environment and Forests
NGO	-	non-governmental organization
O&M	–	operation and maintenance
PMU	–	project management unit
PIU	-	project implementation unit
PWD	-	Public Works Department
REA	–	rapid environmental assessment
SDMA	-	State Disaster Management Authority
SPCB	–	state pollution control board
SPS	-	Safeguard Policy Statement
UEAP	-	Uttarakhand Emergency Assistance Project
UEPPCB	-	Uttarakhand Environment Protection and Pollution Control Board
UCADA	-	Uttarakhand Civil Aviation Development Authority
UJS	-	Uttarakhand Jal Sansthan
UTDB	-	Uttarakhand Tourism Development Board
WTP	-	water treatment plant

NOTE

In this report, "$" refers to US dollars.

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ENVIRONMENTAL ASSESSMENT AND REVIEW FRAMEWORK

A. Introduction

1. Uttarakhand being a tourist and pilgrimage State, attracts a large number of tourist and pilgrims. A major disaster during 15-17 June 2013 severely affected several parts of Uttarakhand, which has a mountainous terrain and a fragile geology. Several towns have been washed away by the unprecedented flash floods and landslides, and a large number of houses, public buildings, roads, bridges, urban, rural, and tourism infrastructure, power generation and distribution facilities have been damaged. The impact on the affected population due to the loss of connectivity has been manifold. The State machinery is currently focused on emergency restoration and connectivity works. The affected regions are susceptible to further damages during the on-going rainy season.

2. Based on the request of India, a Joint Rapid Damage and Needs Assessment (JRDNA) was undertaken by Asian Development Bank (ADB) and the World Bank. ADB agreed to assist the Government of India (GOI) with reconstruction and rehabilitation efforts for which the Uttarakhand Emergency Assistance Project (UEAP) has been formulated as a multi-sector emergency loan. The executing agency (EA) for the UEAP will be Government of Uttarakhand (GOU) acting through State Disaster Management Authority (SDMA). The primary implementing agencies (IA) will be Public Works Department (PWD) for roads, bridges, urban roads, and trekking routes including eco-trails[1]; Department of Tourism (DOT) through Uttarakhand Tourism Development Board (UTDB), Garhwal Mandal Vikas Nigam (GMVN), and/or Kumaon Mandal Vikas Nigam (KMVN) for tourism infrastructure, Uttarakhand Civil Aviation Development Authority (UCADA) for helipads, heliports, or helidromes; and Uttarakhand Jal Sansthan (UJS) for urban water supply

3. Due to bad weather, continued flooding and landslides, and the inaccessibility of the affected areas, the field visits for preliminary investigation are still not possible. Under these circumstances, the available data and information has been relied upon to prepare this environmental assessment and review framework (EARF). The EARF was prepared in accordance with ADB's *Safeguard Policy Statement (2009) (SPS 2009)*. The recommendations are consistent with the environmental and related legislations of the GOI at the national, state and local levels. A realistic and engineering assessment with preliminary field surveys and investigations would be undertaken only after some improvement in weather and connectivity.

4. This EARF aims at (i) providing guidelines for selecting subprojects based on environmental eligibility criteria; (ii) identifying relevant environmental clearance procedures that would apply to the subprojects; (iii) determining the anticipated environmental impacts from undertaking the UEAP; (iv) defining the environmental assessment review procedures for subprojects proposed under UEAP for identifying corresponding environmental mitigation measures and developing environmental management and monitoring plans (EMMP) required to avoid, minimize or address anticipated negative environmental impacts; (v) defining procedures to be adopted during implementation to ensure that environmental aspects of the UEAP are dealt with in a comprehensive manner, and (vi) ensuring the adequacy of corresponding staffing, reporting and budget requirements of undertaking the above. This EARF will be disclosed on ADB's website, and will be translated in local language and disclosed on the GOU website.

5. The UEAP comprises the following components:

(i) **Roads and Bridges:** The **a**ctivities will include rehabilitation and reconstruction of roads and bridges damaged or destroyed due to the disaster. This component's main

[1] The implementation may be assigned to various government departments and agencies. .

activities are: (i) rehabilitation of badly affected sections of the existing roads (may also include reconstruction of damaged stretches including realignment if recommended by technical assessment); (ii) improvements to collateral structures such as road shoulders, pavements, protection works, cross drainage structures; etc. (iii) strengthening of slopes including removal of debris due to slides; and (iv) rehabilitation and reconstruction of existing bridges (may also include construction of new bridges recommended as per technical assessment).

(ii) **Water Supply**. The activities will include restoration and upgrading of damaged water supply schemes in 8-10 towns. This component's main activities are: (i) rehabilitation or reconstruction of existing water intake works; (iii) rehabilitation or reconstruction or improvements in existing rising mains, transmission and distribution system, and provision of new associated infrastructure; (iii) rehabilitation of existing water treatment plants including replacement of damaged equipment, and storage reservoirs; (iv) rehabilitation and repairs of pumping stations including replacement of damaged equipment; and (v) rehabilitation or reconstruction or improvements in existing distribution network.

(iii) **Tourism Infrastructure and Facilities:** The activities will include restoration of existing damaged structures, and construction of new facilities that would be used as evacuation routes or relief measures during recurrence of such calamities. This component's main activities are: (i) rehabilitation and repairs to existing helipads; (ii) strengthening of helipads built for immediate evacuation of stranded people and for carrying essential supplies; (iii) construction of new helipads, heliports, or helidromes and associated facilities at locations identified as evacuation sites; (iv) reconstructing or rehabilitating tourist rest houses; (v) construction of multi-purpose shelters and tented accommodation; (vi) repairs and construction of community and public drinking water, sanitation and associated facilities; and (vii) rehabilitation and/or reconstruction of 10 trekking routes including eco-trails, rest houses and public amenities.

(iv) **Urban Roads**. This component will focus on rehabilitation and repairs of critical urban roads and road links with state roads for improved connectivity.

6. The indicative list of subprojects that will be considered under UEAP is given in Appendix 1.

B. Assessment of India's Environmental Framework and Institutional Capacity

7. The fundamental responsibility of GOI of protecting and improving the environment of India is enshrined in the Articles of the Indian Constitution. These articles provide that the State will protect and improve the environment and safeguard forests and wildlife of the country; and every citizen is bound to protect and improve the natural environment and to have compassion for living creatures.

8. The Ministry of Environment and Forests (MoEF) is the prime regulatory body of GOI for formulating environmental policies, laws and rules. It has several divisions that evaluate proposed development activities under applicable legislations, and for issuing environmental clearance (EC) for such developmental project.[2] The Central Pollution Control Board (CPCB) provides technical and advisory support to MOEF in terms of formulating the legislation and developing national standards for usage of water for various purposes, and limiting the liquid, gaseous, and solid emissions and noise levels from different activities. The enforcement of the provisions under these environmental legislations and associated notifications are done by a range of agencies in the central and state governments. The state pollution control boards (SPCB) are vested with the powers to implement certain provisions of specific legislations, and are the enforcement agencies for ensuring that the

[2] The GOI uses thresholds for categorization in addition to project type and location. The GOI follows national standards as prescribed by the Central Pollution Control Board.

activities continue to comply with these emission standards and relevant legislations.[3] The SPCB can, however, specify stricter standards than the national standards depending on the sensitivity of the location. The departments of forests and wildlife of GOU have the responsibility for enforcing provisions of several forest and wildlife related acts. The range of legislations, notifications, and the complexity of institutions vested with enforcement authority lead to the conclusion that the relevant clearances and approvals required for subprojects would vary from case to case.

9. The primary legislation governing environmental assessment of projects in India is the Environment (Protection) Act (No. 29 of 1986) and rules and notifications issued thereunder. Several other legislations govern the protection of natural resources and clearance requirements on projects and activities that have a bearing on such resources. These legislations include (but are not limited to) the Water (Prevention and Control of Pollution) Act 1974 as amended; the Water (Prevention and Control of Pollution) Cess (Amendment) Act (No. 19 of 2003) as amended; the Air (Prevention and Control of Pollution) Act 1981 as amended; the Wildlife (Protection) Act 1972 as amended; the Wildlife (Protection) Amendment Act (No. 16 of 2003) as amended; the Forest (Conservation) Act 1980, as amended; the Forest (Conservation) Rules, 1981 as amended; the Biological Diversity Act (No. 18 of 2003) as amended; the Wetlands (Conservation and Management) Rules 2010 as amended; the Environmental Impact Assessment Notification of 2006 as amended; the Coastal Regulation Zone Notification of 2011 as amended; and the Noise Pollution (Regulation and Control) Rules, 2000 as amended. These legislations and overriding policies are available on the web site of the MOEF.[4] Apart from these, there are technical guidelines and specifications issued by different ministries such as Environmental Impact Assessment Guidelines for Rail, Road & Highways Projects, 1989; and the Indian Roads Congress Guidelines for Environmental Impacts Assessment (IRC: 104-1988) of highway projects. Similarly there are technical manuals on water supply and treatment issued by the Central Public Health and Environmental Engineering Organization. There are several standards that need to be complied with. These are for drinking water, discharge of wastewater, air emissions, and noise levels. The environmental assessment review procedures for any subproject included under UEAP will address the requirements of all applicable acts, rules, notifications, and standards referred above.

10. The following are the key operational principles of the GOI's Environmental Policy and Regulatory Framework:

(i) The environmental impact assessment (EIA) is primarily concerned with assessing direct and indirect impacts of a project on the biophysical and human environment, and ensuring that these impacts are addressed by appropriate environmental protection and enhancement measures;
(ii) The EIA supports project proponents in incorporating environmental considerations in project planning and in determining environmental impacts of their projects;
(iii) Project proponents are responsible for determining and disclosing all relevant project information needed for a methodical assessment of environmental impacts of their proposed projects;
(iv) Effective regulatory review of an EIA depends on timely, full, and accurate disclosure of relevant information in the EIA by project proponents to project stakeholders; and
(v) Meaningful public participation is a part of EIA and it will be assessed in considering EC application.

11. Considering the nature and scale of the subprojects under transport, water supply and tourism infrastructure facilities under UEAP and associated environmental aspects, these acts and regulations require that the facility owners shall obtain:

[3] At the Union Territories, pollution control committees are tasked with this responsibility.
[4] www.envfor.nic.in.

(i) clearance from the relevant regulatory agencies at the Centre and the state for all improvements and rehabilitation activities that fall within the purview of EIA Notification 2006, and Wetland Rules 2010; and located in the legally protected areas;
(ii) clearance from the Department of Forests, GOU, if required, to carry out the work within forest areas, to use forest land for non-forest purposes, and to fell roadside trees; the department also requires that cutting of trees be compensated by compensatory afforestation[5];
(iii) a no-objection certificate for the subproject activity, and consents from Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) (to establish before setting up and to operate prior to commencement of operations), for construction equipment (such as hot-mix plants, quarrying and crushers, and batch mixing plants); and water treatment plants, if required; and
(iv) permission from Uttarakhand Ground Water Board to extract water for construction purposes, if required.

12. During the operational phase of the subproject, it is required that regular environmental monitoring under those regulations is carried out to ensure that the subprojects continue to comply with the statutory environmental standards prescribed.

C. **Anticipated Environmental Impacts**.

13. The UEAP primarily aims to repair, rehabilitate or reconstruct the existing infrastructure damaged or destroyed by the disaster. In some cases, new construction is envisaged (like helipads, multipurpose shelters, trek routes, bridges, realigned roads, etc.). Considering the scale, magnitude, and type of the works proposed under UEAP, most of the subprojects are judged to have less adverse environmental impacts that are largely construction-related, site specific, and temporary and reversible in nature. These impacts will be mitigated through carefully developed EMMPs that will be incorporated into related contract documents. Thus, most of the subprojects under UEAP are expected to qualify as of environment category B (environment categorization explained in subsequent paragraphs). However, the exact locations at which the works are to be carried out have not yet been identified in most of the cases. Some of these subprojects are likely to be in close proximity to, or within the environmentally sensitive areas such as national parks and wild life sanctuaries. Therefore, possibility of causing certain significant environmental impacts is not ruled out. In such cases, the location, design and construction of these structures will need to be done with due consideration of the environmental impacts and clearances required under the statutory environmental regulations of India. The maps showing the boundaries of all of these environmentally sensitive areas are available. These subproject locations, once finalized or identified, will be superimposed on available maps to assess their likelihood of encroaching upon environmentally sensitive areas. Thus some of the sub-projects may have to be classified as of environment category A.

14. In accordance with ADB's *SPS 2009*, the determination of the environment category of the Project is to be based on the most environmentally sensitive component of the Project. Based on the preliminary data available, the proposed UEAP has been categorized as of environment category A.

15. The implementation of subprojects can have negative impacts on various environmental aspects, namely: (i) topography and drainage; (ii) soil and land use; (iii) surface water; (iv) ground water resources; (v) ambient air quality; (vi) ambient noise

[5] The MOEF has issued specific guidelines in July 2013 for the state of Uttarakhand for expediting the forest clearances to carry out the emergency works in forest areas (excludes works in national parks and sanctuaries).

levels; (vii) biotic environment; (viii) cultural and historic sites; (ix) community utilities; and (x) other socioeconomic impacts. These impacts may arise in the project lifecycle during implementation and/or during operation phase, and in limited cases may also arise after the end of the operation period. The potential environmental impacts are categorized into (i) location impacts, (ii) design and pre-construction impacts, (iii) construction impacts, and (iv) operation and maintenance impacts.

16. A multi-hazard mapping exercise is recommended to be conducted based on which reconstruction of all sector projects may take place. Recovery and reconstruction of many projects may need to consider re-routing and relocation and this mapping exercise would be indispensable for project site identification/relocation etc. During the JRDNA it was decided that the multi-hazard mapping exercise will be developed by the World Bank. ADB will seek to the extent possible to coordinate project site interventions based on the recommendations of this mapping. The environmental assessments and the associated mitigation measures would reflect the recommendations of this mapping exercise as applicable.

17. An illustrative list of potential negative environmental impacts resulting from the proposed components is summarized below:

(i) **Roads and Bridges.** The anticipated environmental impacts comprise: (a) encroachment on protected areas (flora and fauna), and historical, and cultural areas due to hill cutting; (b) disruption to community utilities; (c) deterioration in ambient air quality, and ambient noise levels, and elevated vibrations; (d) soil and groundwater contamination due to establishment and operation of construction and workers camps; (e) increased dust emissions and noise levels due to operations of quarry and borrow sites; (f) use of hazardous substances; (g) improper disposal of excavation spoil; (h) traffic disruption and access obstruction; (i) slides due to soil instability triggered by cutting, blasting operations and soil erosion; (j) workers and community health and safety; (k) water pollution due to runoff from construction machines and bitumen mixing plants; (l) inappropriate location of borrow pits and inadequate protection measures prior to abandoning such pits; (m) road congestion caused by construction vehicles and activities; (n) social conflicts; and (o) poor and inadequate operation and maintenance (O&M) of the rehabilitated systems.

(ii) **Water Supply**. The anticipated environmental impacts comprise: (a) high noise levels from the operation of pumping stations; (b) pollution and health risks resulting from improper handling and/or disposal of sludge from water treatment plants; (c) dust and noise nuisance and blocking of roads during laying of the pipeline network; (d) dust from construction activities, which could be considerable because of the climatic conditions; (e) recurrence of leakage problems; and (f) increased traffic flow resulting from vehicle movement associated with construction activities;

(iii) **Tourism Infrastructure and Facilities.** The anticipated environmental impacts comprise: (i) ecological degradation in legally protected areas and impacts on archeological monuments; (ii) inadequate drainage provisions,; (iii) damage to utility lines within the right-of-way; (iv) increased dust and noise generation due to quarry/borrow pit operations, (v) slides due to soil erosion and slope instability caused by slope cutting (vi) silt and debris runoff to water bodies and drainage courses (vii) dust generation, air and noise from construction activities, (viii) spills of chemicals at site, (ix) lack of safety measures during construction; (x) reduced community health and safety. (xi) discharge of untreated wastewater and solid waste including plastics, bottles, cans, etc. into ecosystems; (xii) temporary disruptions to land use; (xii) limitations on access to roads, sidewalk closures, traffic delays and detours, parking modifications, and increased volumes of construction–related traffic; and (xiii) elevated vibration levels.

(iv) **Urban Roads**. The anticipated environmental impacts comprise: (a) loss of household residences and business premises; (b) possible encroachment on

wetlands; (c) disruption of commercial activities; (d) encroachment on and loss of natural heritage sites, historical areas, cultural areas, or monuments; (e) reduction in width of water courses caused by road embankments may affect the flow of watercourses; (f) noise disturbances affecting educational, healthcare and cultural activities; (g) road blocking and/or increased traffic during construction of facilities; (h) noise, dust, or hazardous material generated by construction activities; (i) increased turbidity and silting of watercourses caused by erosion of soils during construction; (j) silt runoff during construction leading to impairment of downstream water quality; land values; and (k) environmental issues resulting from uncontrolled quarrying of raw materials.

D. Environmental Assessment for Subprojects and/or Components

A. Environmental Criteria for Subproject Selection

18. The EA will ensure that the subprojects under UEAP are properly selected adopting following criteria:

(i) The subprojects with the type of activities listed in ADB *SPS 2009* Appendix 5 (ADB Prohibited Investment Activities List) do not qualify for ADB's financing;
(ii) Subprojects will comply with environmental requirements specified in ADB's *SPS 2009* and those specified in India's environmental laws and regulations, including discharge and emission standards;
(iii) Subprojects likely to be categorized as environmental category A (as defined by ADB's *SPS 2009,* as amended from time to time) will be considered for financing under UEAP;
(iv) Subprojects encroaching into any core or buffer zones of national parks, wildlife sanctuaries, designated wetlands of international importance, or other environmentally sensitive areas shall obtain national, state and local statutory environmental clearances (including clearance from the Supreme Court of India, as required) before commencing with works; and
(v) Subprojects shall not affect any protected historical or cultural heritage sites or areas, and in case the subproject is in close proximity of such sites, all relevant regulatory clearances and approvals would be obtained prior to commencement of works.

B. Environmental Guidelines for Specific Components

19. Taking into account of the potential impacts associated with the subprojects of UEAP, the following environmental guidelines for specific components of UEAP will be adopted.

a) **Roads and Bridges**:

(i) have minimal, if any, realignments through designated wildlife sanctuaries, national parks, areas that are of international significance (e.g. protected wetlands), or heritage sites;
(ii) minimize disfiguration of landscape by road embankments, cuts, fills, and quarries;
(iii) minimize alteration of hydrology of waterways crossed by roads;
(iv) avoid development on flood-prone land or floodplains, low-lying flood-prone areas that cannot be relocated to a safer site, flood defense and mitigation measures should be implemented; and
(v) the design and construction standards for high flood levels to be raised to an appropriate level;
(vi) minimize the risk of driving accidents where construction interferes with preexisting roads.

b) **Water Supply:**

(i) avoid water-use conflicts in abstraction of raw water for water supply with other beneficial water uses;
(ii) avoid development on flood-prone land or floodplains, low-lying flood-prone areas that cannot be relocated to a safer site, flood defense and mitigation measures should be implemented;
(iii) the design and construction standards for high flood levels to be raised to an appropriate level;
(iv) avoid to the extent possible any development on flood-prone land or floodplains;
(v) avoid raw water supply extraction where there are upstream wastewater discharges;
(vi) avoid hazard of land subsidence caused by excessive groundwater pumping;
(vii) avoid over pumping of groundwater, which could lead to salinization;
(viii) avoid generating more sewage than existing community facilities can handle;
(ix) avoid excessive abstraction of water, which could impact downstream water users; and
(x) ensure adequate availability of water at source.

c) **Urban Roads:**

(i) ensure space availability for road safety, residents, pedestrians and for installation of noise and air pollution mitigation measures;
(ii) minimize disfiguration of landscape by road embankments, cuts, fills, and quarries;
(iii) minimize alteration of hydrology of waterways crossed by roads;
(iv) minimize dislocation or involuntary resettlement of people living in right-of-way;
(v) minimize the risk of driving accidents where construction interferes with preexisting roads; and
(vi) minimize the risk of accidents associated with increased vehicular traffic, which may lead to accidental spills of toxic materials and/or loss of life.

d) **Tourism Infrastructure and Facilities:**

(i) avoid areas of incompatible land use (e.g., densely populated residential areas, schools, or hospitals);
(ii) avoid impairment of downstream water quality caused by release of inadequately treated or untreated sewage;
(iii) choose sites where overflows can be controlled to avoid impacts on neighboring properties;
(iv) avoid disturbance to the extent, depth, or hydrological balance of wetlands;
(v) avoid development on flood-prone land or floodplains, low-lying flood-prone areas that cannot be relocated to a safer site, flood defense and mitigation measures should be implemented;
(vi) the design and construction standards for high flood levels to be raised to an appropriate level; and
(vii) choose sites to minimize hazards to public health and natural ecosystems due to failure of domestic sewage and solid waste management systems

20. A final check on conformity with the selection criteria will be done by the EA prior to the submission of selected subprojects to ADB for ADB‘s clearance. Any subproject, which does not meet the environmental criteria listed above, will be returned to the respective IA for ensuring compliance with the criteria. A subproject that is non-compliant with India’s regulatory requirements will be rejected.

21. All subprojects will be subjected to the environmental assessment process. This is a process of environmental analysis and planning to address the environmental impacts and risks associated with a project. All environmental assessments will follow ADB‘s disclosure

requirements. The disclosure requirement for the EIA report will be changed from the 120 days prior to ADB Board of Directors approval to 120 days prior to award of contract of the subproject.[6]

22. For the subprojects proposed under retroactive financing, the environmental assessment process outlined in following paragraphs will be completed including ADB's approval of such environmental assessment reports prior to award of contracts, and all relevant environmental mitigation and monitoring measures will be made a part of the contract document. In case of some subprojects where the work has commenced prior to completion of the environmental assessment process, a detailed environmental audit will be carried out prior to approval of the subproject under UEAP. The environmental audit report will be prepared and submitted to ADB for approval. The corrective action plans as recommended in the audit report will be implemented by the IAs.

C. Environmental Assessment and Review Procedures for Subprojects

23. This EARF also provides specific procedures to be used for every subproject under the UEAP for (i) environmental classification and assessment though a rapid environmental assessment (REA), an EIA or an initial environmental examination (IEE), of eligible subprojects; (ii) design and implementation of the EMMPs as stipulated in the EIA or IEE; (iii) compliance with public consultation and information disclosure-related requirements; (iv) maintaining records of all subprojects' environment-related documents for disclosure by the EA and the IAs; and (v) monitoring the performance of the EA and the IAs responsible for implementing environmental assessment-related activities, including EMMPs.

24. The environmental assessment procedures to be followed during implementation of the UEAP are guided by the following considerations:

(i) The UEAP is a multi-sectoral loan, involving several implementing agencies;
(ii) It involves a range of subproject approval and implementation arrangements;
(iii) It involves a large number of subprojects and needs to be implemented in an expeditious 'emergency assistance mode; and
(iv) The most subprojects involve reconstruction or rehabilitation of existing infrastructure facilities.

D. Requirements to Environmental Screening and Classification

25. The UEAP will use a classification system to reflect the significance of a project's potential environmental impacts. Each proposed subproject is scrutinized as to its type, location, scale, and sensitivity; and the magnitude of its potential direct, indirect, cumulative, and induced environmental impacts in the project's area of influence. All subprojects will be screened to determine their environmental category based on the ADB's REA Checklist. The templates of the REA checklists for subprojects that may fall across the selected sectors (roads and bridges water supply, urban roads, tourism infrastructure and facilities) are attached in Appendix 2. The subprojects will be assigned one of the following categories:

(i) **Category A.** A proposed subproject is classified as category A if it is likely to have significant adverse environmental impacts that 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 is required;
(ii) **Category B.** A proposed subproject is classified as category B if its potential adverse environmental impacts are less adverse than those of category A subprojects. These impacts are site-specific, few if any of them are irreversible, and in most cases

[6] Since the UAESP is an Emergency Assistance Loan (EAL), a procedural flexibility has been adopted for the disclosure requirements of EIA reports for the subprojects in category A in line with SPS 2009.

mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.

(iii) **Category C.** A proposed subproject is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

26. A subproject's category is determined by the category of its most environmentally sensitive component, which implies that if any one component of a subproject has potential of significant adverse environmental impacts, then the subproject is to be classified as Category A regardless of potential environmental impacts of other aspects of the subproject.

27. In general, a subproject will be classified as Category A' if the project:

(i) has a significant level of environmental impacts requiring complex mitigation measures needing to be prepared through an in depth assessment of the impacts and detailed study for preparing mitigation measures; and

(ii) will generate impact on an ecologically sensitive area, particularly if the subproject passes through or falls within 100 meters of ecologically sensitive areas, particularly designated wildlife sanctuaries, national parks, other sanctuaries, botanical garden, or area of international significance (e.g., protected wetland designated by the Wetland Convention); or pass through any cultural heritage sites designated by UNESCO.

28. Other infrastructure rehabilitation subprojects that do not fall into the above category are typically classified as Category B or C depending upon the scale of impacts.

E. Requirements for Environmental Assessments and Management Plans

29. The procedures for environmental assessment of subprojects must be in line with the requirements of ADB's SPS 2009, as amended from time to time and India's statutory environmental regulations at the national, state, and local levels.

30. It is expected that the majority of subprojects will involve the rehabilitation or reconstruction of damaged infrastructure at existing locations. However in some instances there may be a requirement to relocate infrastructure to new locations. In these instances the EA and respective IA will identify potential direct, indirect, cumulative and induced environmental impacts on and risks to physical, biological, socioeconomic, and physical cultural resources and determine their significance and scope, in consultation with stakeholders, including affected people. If potentially adverse environmental impacts and risks are identified, the EA and the respective IA will undertake an environmental assessment as early as possible in the project cycle. For subprojects with potentially significant adverse impacts that are diverse, irreversible, or unprecedented, the EA and the respective implementing agencies will examine alternatives to the project's location, design, technology, and components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks. The rationale for selecting the particular subproject location, design, technology, and components will be properly documented, including, cost-benefit analysis, taking into account environmental costs and benefits of the various alternatives considered. The "no action" alternative will be also considered.

31. The impacts and risks will be analyzed in the context of the each subproject's area of influence that encompasses:

(i) the primary subproject site(s) and related facilities;

(ii) associated facilities that are not funded as part of the UEAP, and whose viability and existence depend exclusively on the subproject and whose goods or services are essential for successful operation of the subproject;

(iii) areas and communities potentially affected by cumulative impacts of the UEAP, and other sources of similar impacts in the geographical area; and
(iv) areas and communities potentially affected by impacts from unplanned but predictable developments caused by the subproject that may occur later or at a different location.

32. Environmental impacts and risks will also be analyzed for all relevant stages of the project cycle, including preconstruction, construction, operations, decommissioning, and post-closure activities such as rehabilitation or restoration.

33. **Environmental Classification**. The proposals for subprojects would be generated by the EA and/or the respective IAs. The environment specialists attached to the Design and Supervision Consultants (DSC) of the respective IA and/or the environment expert attached to the EA and/or the respective IA will assist the EA and/or the respective IA to develop a rapid environmental assessment of each subproject. The rapid assessment takes the form of a checklist. After screening by the respective IA and/or the EA, duly endorsed REA checklist will be submitted to ADB for review and for ADB's confirmation of the environmental classification of each subproject.

34. **Preparation of EIAs, and IEEs**: Based on confirmation by ADB of the environment category of the subproject, the EA and/or the respective IA will prepare an EIA for subproject classified as Category A and prepare an IEE for subproject classified as B.[7] For category C subprojects, the EA and/or the IAs will review environmental implications of the subprojects. The EIA or IEE for each subproject will include an EMMP that reflects 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. During EIA or IEE preparation, adequate public consultation will be carried out,[8] and the comments from the public will be reflected in the final EIA or IEE report.

35. **Developing Environmental Management and Monitoring Plans (EMMP).** An EMMP that addresses the potential impacts and risks identified by the environmental assessment shall be prepared for each Category A or B subproject. The EMMP will 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. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the project is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in this document. The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the subproject's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties", the polluter pays principle, the precautionary approach, and adaptive management. The preparation and content of the EMMP is given in ADB's SPS 2009.

36. **Occupational health and safety aspects.** The EMMP will include provisions to provide workers with a safe and healthy working environment, taking into account risks inherent to the particular sector and specific classes of hazards in the work areas. The EA and the IAs will 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

[7] The content of an EIA or IEE study and recommended formats of EIA and IEE reports are given in SPS 2009; and explained in the *Environmental Assessment Guidelines of the Asian Development Bank* available at the following URL: http://www.adb.org/documents/Guidelines/Environmental_Assessment/default.asp

[8] Two consultations will take place for EIAs and one consultation will take place for IEEs as detailed in Chapter X of EAG (2003).

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. The EA and the IAs will apply preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

37. **Community health and safety.** The EIAs and IEEs will 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 the EMMP will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts. These measures will favor the prevention or avoidance of risks and impacts over their minimization and reduction. The EA and the IAs will inform affected communities of significant potential hazards in a culturally appropriate manner. The EA and the IAs will be prepared to respond to accidental and emergency situations. This preparation will include response planning document(s) that addresses the training, resources, responsibilities, communications, procedures, and other aspects required to respond effectively to emergencies associated with project hazards. Appropriate information about emergency preparedness and response activities, resources, and responsibilities will be disclosed to affected communities.

38. If some residual impacts are likely to remain significant after mitigation, the EMMP will also include appropriate compensatory measures (offset) that aim to ensure that the project does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity, preservation of ambient conditions, and greenhouse gas emissions. Monetary compensation in lieu of offset is acceptable in exceptional circumstances, provided that the compensation is used to provide environmental benefits of the same nature and is commensurate with the project's residual impact.

39. The EMMP will define expected outcomes as measurable events to the extent possible and will include performance indicators or targets that can be tracked over defined periods. It will be responsive to changes in project design, such as a major change in project location or route, or in technology, unforeseen events, and monitoring results.

40. At times, a third party's involvement will influence implementation of the EMMP. A third party may be, inter alia, a government agency, a contractor, or an operator of an associated facility. When the third-party risk is high and the EA/IAs have control or influence over the actions and behavior of the third party, the EA/IAs will collaborate with the third party to achieve the outcome consistent with the requirements for the EA/IAs. Specific actions will be determined on a case-by-case basis.

41. The EA/IAs will use qualified and experienced experts to prepare the environmental assessment and the EMP. For highly complex and sensitive projects (if identified during implementation), independent advisory panels of experts not affiliated with the project will be used during project preparation and implementation.

42. An element of the SPS (Environment) provides that ADB address the environmental aspects of its operations through a systematic approach to the purchase of goods and

services that are thought to be less damaging to the environment[9] than other goods and services that serve the same purpose.

43. **Biodiversity Conservation and Sustainable Natural Resource Management.** The EA and the IAs, through application of the EARF provisions, shall identify measures to avoid, minimize or mitigate potentially adverse impacts and risks and, as a last resort, propose compensatory measures, such as biodiversity offsets, to achieve no net loss or a net gain of the affected biodiversity.

44. **Natural habitats.** In areas of natural habitat, the project will not significantly convert or degrade such habitat, unless the following conditions are met:
(i) no alternatives are available;
(ii) a comprehensive analysis demonstrates that the overall benefits from the project will substantially outweigh the project costs, including environmental costs; and
(iii) any conversion or degradation is appropriately mitigated.

45. Mitigation measures will be designed to achieve at least no net loss of biodiversity. They may include a combination of actions, such as postproject restoration of habitats, offset of losses through the creation or effective conservation of ecologically comparable areas that are managed for biodiversity while respecting the ongoing use of such biodiversity by Indigenous Peoples or traditional communities, and compensation to direct users of biodiversity.

46. **Critical habitats.** In subprojects to be implemented in areas of critical habitats[10], the EA and the IAs shall ensure that:
(i) there are no measurable adverse impacts, or likelihood of such, on the critical habitat which could impair its high biodiversity value or the ability to function;
(ii) the project is not anticipated to lead to a reduction in the population of any recognized endangered or critically endangered species[6] or a loss in area of the habitat concerned such that the persistence of a viable and representative host ecosystem be compromised; and
(iii) any lesser impacts are mitigated.

47. When the project involves activities in a critical habitat, the borrower/client will retain qualified and experienced external experts to assist in conducting the assessment.

48. **Legally protected areas.** In circumstances where some project activities are located within a legally protected area, the borrower/client will meet the following requirements:
(i) act in a manner consistent with defined protected area management plans;
(ii) consult protected area sponsors and managers, local communities, and other key stakeholders on the proposed project; and
(iii) implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area.

[9] Goods controlled (i.e., banned or scheduled to be phased out of production and use) under international environmental or public health agreements shall not be allowed. Substances controlled under these agreements are among the products most damaging to the environment and human health. These include ozone-depleting substances, asbestos, chemicals covered by Rotterdam Convention, and persistent organic pollutants covered by the Stockholm Convention. Except as ADB may otherwise agree, goods must not contain products identified on ADB's Prohibited List. Suppliers should provide such reports or information as needed to ensure that this requirement is met.

[10] Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union Classification, the Ramsar List of Wetlands of International Importance, and the UNESCO world natural heritage sites.

49. **Review of EIAs, and IEEs**. EIAs, and IEEs prepared by the EA and/or by the respective IAs, and duly vetted and endorsed by the respective environment staff at the EA and/or the IAs will be submitted to ADB for review and approval. The EIAs and IEEs will be disclosed on ADB website as per SPS 2009 and ADB's *Public Communications Policy (2011)*. The EIAs will also be disclosed for 120 days prior to award of contract for the subproject. In the event that a subproject design undergoes changes following approval of the EIA or IEE, and the new design has elements that impinge on the environmental impacts identified and addressed in the original EIA or IEE, or introduces new potential environmental impacts, the EIA or IEE must be revised by the EA and/or by the respective IA, and will be subject to re-approval by ADB, to address these new impacts. The revised or updated EIAs and IEEs will be disclosed on ADB website. Any subproject observed to be in noncompliance with ADB's guidelines or requirements will not be eligible for financing under UEAP.

50. **Supervision, Monitoring and Reporting**. The information on the implementation of the EMMP, as well as that on the environmental safeguard compliance will be systematically documented and reported to ADB by the EA as part of the semi-annual reports on the implementation of the EMMPs for environment category A subprojects, and on annual basis for environment category B subprojects. Each IA will ensure that all environmental assessment documentation, including the environmental monitoring reports, are properly and systematically kept as part of subproject specific records. All such monitoring reports will be disclosed on ADB website.

51. Since UEAP will be administered as an emergency assistance, there will be a need to implement some subprojects on an urgent basis before the onset of the next monsoon rains. The severe winter season during November to February also reduces the working period. A review of available information on the indicative list of subprojects suggests that many interventions are of similar nature, and will not have extensive or severe environmental impacts. Hence, based on environmental screening through REA checklists, sectoral (generic) IEEs may be prepared for such subprojects. However, where the REA checklists indicate environmental impacts of a serious nature, a detailed environmental assessment (an IEE or an EIA as required) will be carried out.

52. The EA and the IAs shall ensure that ADB is given access to undertake environmental due diligence for all subprojects. However, the EA and the IAs have the main responsibility for undertaking environmental due diligence and monitoring the implementation of environmental mitigation measures for all subprojects. The due diligence report as well as monitoring reports on implementation of the environmental management plan will to be documented systematically, will also be disclosed on GOU website, and will made available to the public if requested.

E. Consultation, Information, Disclosure and Grievance Redress Mechanism

A. Public Consultation

53. The JRDNA provides an overview of the total damage caused by the disaster. The analysis also indicates the type of projects that will need to be undertaken, and a prioritized list of interventions across the identified sectors has been compiled in consultation with the relevant IAs and the EA. Although these subprojects will be undertaken for the welfare of the communities, to rehabilitate, or reconstruct essential and important infrastructure, it is still likely that the environment, communities and immediate stakeholders may be affected by the reconstruction exercise. In cases, infrastructure may need to be constructed along new alignments, and locations, thereby, disturbing habitat that was previously not affected. In order to minimize any impacts on the communities and the environment rendered fragile by the devastating calamity, it is important to involve communities in the reconstruction process through a system of consultation.

54. The EA and the IAs will ensure that meaningful public consultations[11] are undertaken during the assessment process for the subprojects with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. According to ADB's SPS, public consultation is mandatory as part of environmental assessment of subprojects, and best practice approaches should be followed. Public consultation for category A subprojects need to be carried out during the early stage of environmental assessment preparation and throughout the project implementation to address any environmental issues that affect the local communities, NGOs, governments, and other interested parties. For all category A subprojects, the SPS requires public consultation at least twice: once during the early stages of EIA field work and once when the draft EIA report including EMMP is available, and prior to loan appraisal by ADB (since UEAP is an EAL, the draft EIA reports will be prepared during implementation and discussed with local communities and other stakeholders prior to submission to ADB for approval). For category B subprojects it is recommended that public consultation be carried out during the early stages of the environmental assessment process and throughout the project implementation to address any environmental issues that affect the local communities, NGOs, governments, and other interested parties. It is important that consultation with stakeholders occurs at an early stage of environmental assessment preparation, and throughout project implementation. The EA and the IAs will ensure that the consultation process with the local communities and other stakeholders is continued throughout during the implementation phase. The concerns raised by the local communities shall be addressed by the EA/IAs through proper implementation of EMMPs and grievance redress systems.

55. A variety of approaches can be adopted, which are described in detail in the ADB Environmental Assessment Guidelines (2003). Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report.

56. Consultation will be based on the following principles:

(i) early start in the individual project preparation stage and continuation throughout the project cycle;
(ii) timely disclosure of relevant information to affected people in a comprehensible and readily accessible format in local language;
(iii) ensuring the absence of intimidation or coercion during public consultation;
(iv) gender inclusive and responsive with focus on disadvantaged and vulnerable groups, and
(v) enabling the integration of all relevant views of affected people and stakeholders into decision-making.

B. Information Disclosure

57. The project and subproject related information shall be disclosed through public consultation and more formally by making documents and other materials available in a form and at a location in which they can be easily accessed by stakeholders. This normally involves making draft reports available at public locations in the subproject locations and providing a mechanism for the receipt of comments, and making documents available more widely by lodging them on the ADB and the EA's and IAs' websites. The EA and the IAs will

[11] Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (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 and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

submit to ADB the environmental assessment documents and monitoring reports for disclosure on ADB's website. Since UEAP is an EAL, the EARF will be disclosed before project appraisal, where applicable.

58. The information disclosure related requirements for UEAP are:

(i) overall responsibility for ensuring that the environmental requirements of the Project set forth in ADB‟s SPS 2009 and statutory environmental regulations of India lies with the EA and the IAs for the respective subprojects;
(ii) the EA is primarily responsible for ensuring that all environmental assessment documentation, including the environmental due diligence and monitoring reports, are maintained properly and systematically documented as part of the Project record;
(iii) all environmental documents are subject to public disclosure, and are therefore to be made available to public, if requested;
(iv) all environmental assessment documentation for category B subprojects (IEEs) will be posted on the ADB website upon approval of IEEs by ADB;
(v) under the SPS (2009), If any category A subprojects are identified, the draft EIA is to be prepared, and posted on the ADB website 120 days before board approval;[12] Since the UAEP is an EAL, the EIA report will be disclosed on ADB website 120 days prior to award of contract of the subproject;
(vi) the reports on the implementation of EMMPs submitted by the EA to ADB (semi-annual for environment category A and annual for environment category B subprojects; and the third party semi-annual reports submitted by the external environment experts will be disclosed on ADB website.

59. The EA and the IAs will provide relevant environmental information, including information from the documents above in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

C. Grievance Redress Mechanism

60. Since UEAP centers around destroyed or damaged infrastructure, it is anticipated that there could be complaints from the communities at various levels pertaining to the environmental impacts of the infrastructure being rehabilitated or reconstructed.

61. The EA will establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance. Field level grievances will be addressed through Grievance Redress Committees (GRC) to be formally constituted at each IA comprising of members of local government, member of the environment regulatory agency if required, NGOs, project staff, and representatives of the affected people. The environment staff of the IA would be the nodal officer responsible for management of complaints pertaining to environmental aspects. A complaint register would be maintained at each site for a subproject. The GRCs will be formally notified and established at the project sites, and will function as open forums for hearing complaints and exploring quick resolutions to resolving conflicts. Each GRC will record its deliberations and inform the concerned parties of a resolution within 2 weeks of its findings and recommendations. Communities will be informed about the GRC through the outreach mechanism of the EA and the respective IAs. If the grievance cannot be resolved within 2 weeks, the EA is notified to further advise on the situation with higher government bodies. The grievance mechanism will address the concerns and complaints using an

[12] Since the UAESP is an EAL, in line with relevant operational procedures for EAL, a procedural flexibility has been requested for the disclosure requirements of EIA reports for the subprojects in category A. The disclosure requirement for the EIA report will be changed from the 120 days prior to board approval to 120 days prior to award of contract of the subproject.

understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The mechanism developed will be in a manner that it shall not impede access to the existing judicial or administrative remedies.

F. Institutional Arrangement and Responsibilities

62. A project management unit (PMU) will be established in the SDMAfor the UEAP. The PMU will consist of officials from GOU for project and financial management. The PMU will be assisted by experts for project preparation and implementation.

63. The EA will work closely with the IAs for effective implementation of environmental safeguards related requirements. The institutional arrangements and responsibilities are detailed below.

64. The PMU will be responsible for ensuring compliance of subprojects with (i) ADB's SPS 2009 and India's statutory environmental regulations at the national, state and local levels; and (ii) day-to-day coordination with the project implementation units (PIUs) established within respective implementing agencies. The PIUs will be responsible for supervision and monitoring of day-to-day implementation of subprojects. The responsibility of preparing environmental assessment reports will be shared by the EA and the IAs. Academically qualified staff having appropriate professional experience in the area of management of environmental safeguards will be engaged in the PMU and in each PIU on full-time basis till completion of the UEAP. The environment staff in the PMU may be supported by environmental expert. The EA and the IAs will ensure that the environment staff is provided with all requisite infrastructure support (dedicated office space, dedicated vehicle for field visits, laptop, communication facilities, administrative support, etc.) and associated budget for effective supervision and monitoring of implementation of environmental safeguards.

65. The IAs will be supported by design and supervision consultants (DSC). Each DSC will have one environmental specialist on full-time basis till the completion of its contract. Since the works are spread across a number of districts in hilly areas, these environmental specialists would be supported by junior level environmental staff on full time basis if deemed necessary during implementation or during reviews by ADB. The senior engineers of the IAs (in-charge of site works) or their nominated engineering field staff will be trained on key environmental management aspects by the PMU and respective PIU environment staff, and will be assigned the task of monitoring day-to-day implementation of the EMMPs in the field.

66. For monitoring of environmental parameters as outlined in the ADB approved EMMPs, appropriate monitoring agencies would be engaged by the contractors (cost to be included in each contract based on subproject specific monitoring plans) or by the IAs for the monitoring works not included in the civil works contracts (cost included in the budget given in table 3).

67. For environment category A subprojects, external environment expert(s) will be engaged by the EA for third party monitoring. These experts will undertake periodic field visits, review implementation of EMMPs, develop corrective action plans if required and discuss those with the environment and field staff of the contractors, DSCs, the respective IAs and the EA. These experts would also review the corrective actions implemented in their subsequent follow-up visits. These experts will submit their semi-annual reports on the implementation of EMMPs directly to ADB.

68. The IAs will be responsible for:

(i) appointing an environment officer as a full-time staff to monitor the implementation of environmental management measures required for each subproject.
(ii) preparing documentation for statutory environmental and forest clearances, permissions, consents, etc. for all projects; following up with respective regulatory agencies (environment and forest departments at the state and central government, UEPPCB, etc.) and responding to their queries; ensuring compliance with the terms and conditions mentioned in the clearances, permissions, consents, etc.; and renewing these within the validity period as mandated under the then prevailing rules and regulations;
(iii) ensuring that all regulatory clearances are obtained before starting civil works for the subproject or the relevant stretches (in case of linear activities like roads, pipelines, etc.);
(iv) ensuring that for each subproject environment classification process is completed and approved by ADB, relevant environmental assessment documents (EIA or IEE) are prepared including the EMMPs, and appropriately disclosed;
(v) ensuring that contractors have access to the EIA, or IEE reports and EMMPs for the relevant subprojects;
(vi) ensuring that contractors understand their responsibilities to mitigate environmental problems associated with their construction activities;
(vii) ensuring that the EMMPs, including all proposed mitigation measures and monitoring programs are properly implemented;
(viii) undertaking monitoring of subprojects and preparing environmental monitoring reports to be delivered to ADB;
(ix) informing ADB immediately in the case of unpredicted environmental impacts occurring during project implementation; preparing and implementing a environmental emergency plan in consultation with relevant government agency, the EA and ADB;
(x) conducting field visits for compliance verification, preparing and ensuring implementation of corrective action plans (including those developed during ADB review missions);
(xi) in the case that a subproject needs to have its siting or alignment changed during implementation, review the environmental classification, obtain its confirmation from ADB (through PMU), reviewing it to determine whether a supplementary study (IEE or EIA) is required. If so, prepare TOR for undertaking a supplementary IEE or EIA, and require an environment specialist to carry out the study, and implement any amendments to the original EMMP.
(xii) preparing a project specific EMMP for the operations that includes a sub-plan for each of the work areas.
(xiii) providing awareness training in environmental management for all employees working on the subproject.
(xiv) ensuring that meaningful public consultations (including both men and women) are undertaken with affected groups and local NGOs. The list of people attending the consultation, time and locations, subjects discussed during consultation will be recorded in a systematic manner.
(xv) sharing information and disclosure of environmental safeguard documents (including any corrective action plans prepared in cases of change to original project design) as required.

69. The PMU within the EA will be responsible for the following responsibilities:

(i) appointing an environment expert as a full-time staff to provide guidance and coordinate with the IAs in the implementation of environmental safeguards for UEAP (may be supported by project support office funded under technical assistance);
(ii) preparing environmental screening checklists for each subproject after due consultation with implementing agencies, and submit to ADB for approval;

(iii) based on the environment category approved by ADB for the subproject, preparing terms of reference (TOR) to conduct IEEs or EIAs; preparing EIAs or IEEs and relevant EMMPs in consultation with the IAs as per ADB's SPS (2009) and India's statutory environmental requirements, and submit to ADB for its approval;.
(iv) ensuring that EMMPs and other specific conditions, if any, are included in bidding and subsequently in contract documents;
(v) submitting the environmental monitoring reports to ADB after review and endorsement;
(vi) conducting field visits for compliance verification, preparing and ensuring implementation of corrective action plans (including those developed during ADB review missions);
(vii) conducting capacity building programs in consultation with ADB for strengthening of environmental assessment , management, and monitoring capability of the staff from PMU, PIUs, the EA, the implementing agencies, other line agencies as deemed necessary, DSCs, and contractors; and
(viii) ensuring that external environmental expert(s) is/are engaged for monitoring of all category A subprojects; submission of a external monitor's report covering all environment category A subprojects directly to ADB on semi-annual basis; implementation of corrective actions (through IAs) recommended by the external monitor or by ADB.

70. The proposed institutional arrangements are given below:

Table 2: Proposed Institutional Arrangements

Unit	Designation	Remarks
PMU at the EA	Environmental Expert	Full-time
PIUs in respective Implementing Agencies	Environmental Officer	Full-time
Design and Supervision Consultants (DSCs)	Environmental Specialist	Full-time in each DSC
	Environmental Assistant	1 in each DSC, full time if deemed necessary
External Monitor (in EA)	Environment Monitoring Specialist	Intermittent Inputs (18 person-months over 36 months)

71. ADB will take the following responsibilities:

(i) review the REA checklists submitted for the subprojects, and confirm environment categorization;
(ii) in case of EIAs and IEEs prepared for each subproject (both new or updated as applicable), review them as a basis for the approval of subprojects;
(iii) review of any corrective action plan prepared for environmental safeguards during project implementation, as well as environmental monitoring reports;
(iv) disclose the EIAs and IEEs and the environmental monitoring reports on ADB web site in line with disclosure requirements outlined in SPS 2009;
(v) monitor the implementation of the environmental assessment procedures described above and the approved EMMPs;
(vi) conduct environmental safeguards due diligence as part of project review missions;
(vii) provide assistance to the EA and the IAs, if required, in carrying out their responsibilities; and
(viii) provide resource persons during environment capacity building events to deliver lectures on ADB specific requirements.

A. Staffing Requirements and Budget

72. One environmental expert will be based in PMU of the EA and each of the respective PIUs of implementing agencies. Consultant support for environmental management and monitoring will be provided to enhance the existing resources of each of the PIUs. UEAP's costs will incorporate a budget and resources needed to (i) implement the environmental review and screening procedure, (ii) undertake the environmental assessment studies for the subprojects, (iii) monitor the implementation of EMMPs, and (iv) undertake environmental mitigation measures as required.

73. A timeframe of 21 person-days is considered sufficient to prepare an IEE report, and up to 120 days is considered sufficient for an EIA report as per ADB requirements. Hence the budget allocation as per the local rates would be in the range of $4,000 for an IEE and $15,000 for an EIA. At present no data is available in terms of the number of subprojects that would qualify as of environment category A (requiring an EIA) and of category B (requiring an IEE). It is also possible to bunch the subprojects falling in one geographical area, and prepare consolidated EIA or IEE reports. Based on the indicative list of subprojects, about 30 consolidated reports (both EIA and IEEs put together) are envisaged, and a budget provision of $250,000 is considered.

74. Sufficient budget funds and resources have been incorporated into UEAP to cover costs to (i) implement the environmental review procedures, (ii) conduct IEEs and EIAs for the follow up subprojects, (iii) monitor the implementation of the EMMPs, and (iv) undertake environmental monitoring by PIUs.

75. The cost of conducting training, undertaking monitoring of environmental parameters through recognized laboratories (part of civil contract), hiring environmental consultants, and implementing the EARF will also be incorporated in UAESP.

76. Implementation of the above environmental assessment and review procedures would require the following budget:

Table 3: Estimated Cost for Implementation of Environmental Management and Monitoring Plans

Item	No. of Units	Rate per Unit ($)	Budget (USD)
Environmental expert attached to PMU in the EA	1 person x 36 months	2,000 per month	72,000[13]
Environmental officers attached to PIU in each IA	3 persons x 36 months	2,000 per month	216,000
Environmental specialists attached to the DSCs	3 persons x 36 months	4,000 per month	432,000[14]
Environmental assistants to support the Environmental specialists within the DSCs (if deemed necessary)	3 persons x 36 months	1,800 per month	194,400[15]
Environment monitoring specialist (external monitor) in the EA for third party monitoring of category A subprojects.	0.5 persons x 36 months	5000 per month	90,000[16]
Preparation of environmental	Lumpsum	250,000	250,000[17]

[13] May be supported by the technical assistance for project support office
[14] The cost is supported by the consultancy contracts.
[15] The cost is supported by the consultancy contracts
[16] May be supported by the technical assistance for project support office
[17] May be supported under consultancy contracts or project support office budget

Item	No. of Units	Rate per Unit ($)	Budget (USD)
assessment reports (EIAs and IEEs)			
Office expenditure related to preparation of environmental assessment reports and EMMPs.	Lumpsum	25,000	25,000
Provision of travel budget and expenditure of monitoring the implementation of EMMPs	Lumpsum	1000 per month per PIU and PMU for 36 months	144,000
Capacity building programs (3 per year for 3 years)	Lumpsum	50,000	50,000
Contingency			26,600
TOTAL			1,500,000

G. Monitoring Environmental Performance and Supervision

77. Environmental assessment will include environmental monitoring plans identifying environmental monitoring activities to ensure that negative environmental impacts are being addressed effectively through implementation of EMMPs. An environmental monitoring plan will be prepared for each subproject. It will identify environmental parameters to be monitored; describe sampling stations, frequency of monitoring, applicable standards, agencies and institutions responsible for monitoring; and provide indicative monitoring costs. The extent of monitoring activities, including their scope and periodicity, will be commensurate with the project's risks and impacts. The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the monitoring plan prepared as part of the EMMP. Implementation of the EMMP during construction will be done by the contractor and supervised by the DSC's environment specialist. The IAs will monitor contractor's environmental performance. The budget for environmental monitoring shall be included as part of civil works and DSC contracts. This plan will require environmental monitoring mechanisms to be used to indicate the effectiveness of the EMMP in mitigating negative impacts identified in the EIA or IEE report. The EA has the overall responsibility of fulfilling environmental requirements of the GOI and GOU, and monitoring the implementation of the EMMPs for all subprojects under UEAP. The PMU at the EA would be assisted by the respective PIU in each IA. The DSCs would provide support to the respective IAs in this regard.

78. During the design and preconstruction stage, monitoring will be the responsibility of the IAs supported by the EA. This is mainly in the form of review and verification of designs and incorporation of mitigation measures into design and contract documents. Mitigation measures to be taken during the construction stage will be mostly implemented by the main contractor. The PIUs will also monitor the environmental performance. During the defect liability period, monitoring will be the responsibility of the respective IAs. .During the operation stage, monitoring will be the responsibility of the facility owner or the operator, such as the urban local body or line department or agency. The SPCB may carry out third-party monitoring in line with the regulatory requirements of India. Although sufficient care and appropriate mitigation will be incorporated into the design of these facilities, performance monitoring during operation will be essential to making the investments environmentally suitable and socially acceptable. Therefore, environmental parameters to be monitored during the subproject lifecycle will be identified and during environmental assessment and recorded in the EIA or IEE reports prepared for the subprojects.

79. Reports on the implementation of environmental management and environmental monitoring plans need to be documented systematically. The EA and the IAs shall ensure

that ADB is given access to undertake environmental review of any subproject, as and when required. When unexpected environmental impacts are encountered during implementation, the EA and the IAs will inform ADB immediately, and in close consultation with ADB, shall undertake remedial measures to mitigate those impacts at the earliest opportunity. These environmental mitigation measures shall be implemented by the respective IAs and thoroughly monitored by the EA. The actions and the results shall be recorded in writing and included in the environmental monitoring report. The IAs will prepare quarterly reports for subprojects that will capture the status of implementation of mitigation measures and monitoring carried out thereof and submit to the EA. The EA will consolidate reports received from each IA, and submit the consolidated report semi-annually for category A subprojects and annually for category B subprojects to ADB, which will be disclosed on ADB website. If the EA finds any issues that need further environmental monitoring and/or mitigation measures, it will give instruction to IAs, and inform ADB. ADB will review the implementation of the EMMP, both through semi-annual /annual reports from the EA, and through its review missions.

80. ADB will require the EA and respective implementing agencies to:

(i) establish and maintain procedures to monitor the progress of implementation of EMMPs;
(ii) verify the compliance with environmental measures and their progress toward intended outcomes;
(iii) document and analyze monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports;
(iv) follow up on these actions to ensure progress toward the desired outcomes,
(v) retain qualified and experienced external experts to verify monitoring information for projects classified as of environment category A;
(vi) use independent advisory panels to monitor project implementation for highly complex and sensitive projects (if identified during implementation); and
(vii) submit periodic monitoring reports on safeguard measures as agreed with ADB.

81. During review missions, ADB will assess environmental compliance with all environmental requirements. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental impacts;
(ii) conduct supervision missions with detailed review by ADB‟s safeguard specialists/officers for sub-projects with significant adverse environmental impacts;
(iii) review the semi-annual and annual monitoring reports submitted by the EA to ensure that adverse impacts and risks are mitigated as planned and as agreed with ADB;
(iv) work with the EA and respective IAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to reestablish compliance as appropriate; and
(v) prepare project completion reports that assess whether the objective and desired outcomes of the EMMPs have been achieved, taking into account the baseline conditions and the results of monitoring.

82. This EARF has been formulated for the use of the EA and the IAs to ensure that the subprojects will be prepared and implemented in accordance with the statutory environmental regulations at the national, state and local levels, and ADB's *SPS 2009*, as amended from time to time.

Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	India /Uttarakhand Emergency Assistance Project
Sector Division:	

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause…			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?			
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?			

Screening Questions	Yes	No	Remarks
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?			
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ dislocation and compulsory resettlement of people living in right-of-way?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?			
▪ increased noise and air pollution resulting from traffic volume?			
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?			
▪ social conflicts if workers from other regions or countries are hired?			

Screening Questions	Yes	No	Remarks
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.			

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	REMARKS
• Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (eg., increased erosion or landslides could increase maintenance costs, permafrost melting or increased soil moisture content could affect sub0-grade).			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (eg., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by encouraging settlement in areas that will be more affected by floods in the future, or encouraging settlement in earthquake zones)?			

Note: Hazards are potentially damaging physical events.

Appendix I: Environments, Hazards and Climate Changes

Environment	Natural Hazards and Climate Change	Example Impact on Roads and Highways
Arid/Semi-arid and desert environment	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.	Reduced availability of water for compaction during construction, increased sand on carriageways reduce road safety, road alignment may need to be reviewed where, for example, agriculturally productive zones are shifting.
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.	Increased landslides and mudflows disrupt road networks, Increased moisture content in the subsurface can result in increased penetration of water into the fill, which may also collapse, Reduced effectiveness of drainage which results in a reduction in the bearing capacity of the soils which become saturated
River valleys/ deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.	Same as above
Small islands	Small islands generally have land areas of less than 10,000km^2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.	Increased salinity increases corrosion of materials which can break-down, Road is eroded by increased wave action, Increased flooding from overtopping of sea-water over road or salt-water intrusion in to groundwater,
Mountain ecosystems	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.	Damage to infrastructure from landslides and mudflows, permafrost melting causes damage to roads, glacial lake outbursts wash out river-crossings.
Volcanic	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often	Damage and loss of roads, insecuirity for

Environment	Natural Hazards and Climate Change	Example Impact on Roads and Highways
environments	fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.	roadworks crew and maintenance

Rapid Environmental Assessment (REA) Checklist

Instructions:

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(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India /Uttarakhand Emergency Assistance Project

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
B. Potential Environmental Impacts Will the Project cause…			
▪ pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?			

Screening Questions	Yes	No	Remarks
▪ hazard of land subsidence caused by excessive ground water pumping?			
▪ social conflicts arising from displacement of communities ?			
▪ conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?			
▪ unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?			
▪ delivery of unsafe water to distribution system?			
▪ inadequate protection of intake works or wells, leading to pollution of water supply?			
▪ over pumping of ground water, leading to salinization and ground subsidence?			
▪ excessive algal growth in storage reservoir?			
▪ increase in production of sewage beyond capabilities of community facilities?			
▪ inadequate disposal of sludge from water treatment plants?			
▪ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?			
▪ impairments associated with transmission lines and access roads?			
▪ health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.			
▪ health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ noise and dust from construction activities?			
▪ increased road traffic due to interference of construction activities?			
▪ continuing soil erosion/silt runoff from construction operations?			

Screening Questions	Yes	No	Remarks
▪ delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?			
▪ delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?			
▪ accidental leakage of chlorine gas?			
▪ excessive abstraction of water affecting downstream water users?			
▪ competing uses of water?			
▪ increased sewage flow due to increased water supply			
▪ increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
• Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g.,high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?			

* Hazards are potentially damaging physical events.

Appendix I: Environments, Hazards and Climate Changes

Environment	Natural Hazards and Climate Change	Example Impact on Water Supply
id/Semi-arid and desert environments	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.	Reduced availability of water due to reduced precipitation, increased temperatures, increased water demand and evaporation
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.	Increased landslides and mudflows disrupt water supply networks, water seepage into storage tanks during floods, increased sedimentation and runoff reduce storage capacity and increase maintenance costs
River valleys/deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.	Increased salinity of ground and surface water supplied caused in part by salt water intrusion, contamination of water supplies, physical damage to infrastructure caused by earthquakes
Small islands	Small islands generally have land areas of less than 10,000km2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.	Same as above
Mountain ecosystems	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these	Erratic water supply caused by glacial melting, loss of infrastructure investment resulting from rockfalls

Environment	Natural Hazards and Climate Change	Example Impact on Water Supply
	environments.	
Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.	Damage and loss of infrastructure, insecurity for local communities and settlements.

Rapid Environmental Assessment (REA) Checklist

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(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	India /Uttarakhand Emergency Assistance Project
Sector Division:	

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Legally protected Area (core zone or buffer zone)			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Special area for protecting biodiversity			
C. Potential Environmental Impacts Will the Project cause…			
▪ impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to physical cultural resources?			
▪ disturbance to precious ecology (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?			

Screening Questions	Yes	No	Remarks
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased air pollution due to project construction and operation?			
▪ noise and vibration due to project construction or operation?			
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			
▪ generation of solid waste and/or hazardous waste?			
▪ use of chemicals?			
▪ generation of wastewater during construction or operation?			

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?			
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?			

Appendix I: Environments, Hazards and Climate Change

Environment	Natural Hazards and Climate Change
Arid/Semi-arid and desert environments	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.
River valleys/ deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.
Small islands	Small islands generally have land areas of less than 10,000km^2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.
Mountain ecosystems	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.
Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.

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(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India /Uttarakhand Emergency Assistance Project

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
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▪ impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to physical cultural resources?			
▪ disturbance to precious ecology (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?			

Screening Questions	Yes	No	Remarks
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased air pollution due to project construction and operation?			
▪ noise and vibration due to project construction or operation?			
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			
▪ generation of solid waste and/or hazardous waste?			
▪ use of chemicals?			
▪ generation of wastewater during construction or operation?			

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Appendix I: Environments, Hazards and Climate Change

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Small islands	Small islands generally have land areas of less than 10,000km^2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.
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Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.