Initial Environment Examination

Project Number: 47229-001
October 2016

IND: Uttarakhand Emergency Assistance Project (UEAP)

Package No.: UK/UEAP-T(GMVN)/DDN/09/Lot C1/C2/C3/C4/C5/U1/U2/U3/U4/U5/U6 - Renovation and Up-gradation of Additional Damaged Tourism Assets in disaster Affected Districts Uttarkashi & Chamoli

Submitted by

Project implementation Unit –UEAP, Tourism (Garhwal), Dehradun

Asian Development Bank

GM/AS

PROJECT IMPLEMENTATION UNIT –Tourism (Garhwal)

Uttarakhand Emergency Assistance Project (UEAP)

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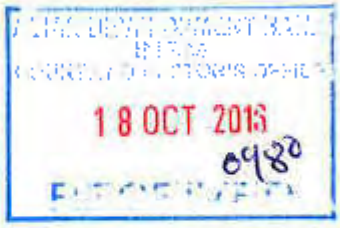
Ref.: 2077 /PIU-Tourism (Garhwal)/2016-17 Dated: 06.08.2016



To,

Country Director
South Asia Department
India Resident Mission
4, San Martin Marg, Chanakyapuri
New Delhi – 110021, India

Sub : ADB Loan No. 3055-IND, UEAP
Submission of Corrected IEE Report for Sub-Project of Renovation and Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Uttarkashi & Chamoli Districts in the State of Uttarakhand-Environmental Considerations.
Package No.: UK/UEAP-T(GMVN)/DDN/09/LOT C1,C2, C3, C4, C5,U1, U2, U3, U4, U5 & U6

Dear Sir,

This has reference to your observations mentioned in your letter dated 14.07.2016 regarding Initial Environmental Examination (IEE) Report for Renovation and Up-gradation of Additional Damaged Tourism Assets In Disaster Affected Uttarkashi & Chamoli Districts in the state of Uttarakhand – Environmental Considerations. We have incorporated the said observations and the corrected IEE Report is here by submitted for your review and approval.

Encl: As above

Yours sincerely

(Atul Kumar Gupta)
Program Manager
PIU-Tourism (Garhwal), UEAP

Copy to:

1. Program Director, UEAP/UDRP
2. Mr. A.K. Motwani, Team Leader, UEAP (Tourism), ADB
3. Mr. Girish Mahajan, Sr. Environmental Specialist, ADB
4. Mr. Ashok Srivastava, Sr. Project Officer (Tourism Sector), ADB
5. Project File

Program Manager
PIU Tourism (Garhwal), UEAP

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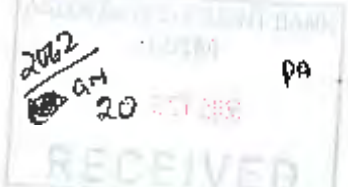

2ft copy mail on 8.08.16.

कार्यालयः निदेशक/वन संरक्षक नन्दादेवी बायोस्फियर रिजर्व, गोपेश्वर।
Email dirndbr-forest-uk@nic.in Off. Ph.&fax 01372252497

पत्रांक– 1150 /15-1 दिनांक 27 सितम्बर 2016

सेवा में,

प्रोग्राम मैनेजर
यू.ई.ए.पी.–पी.आई. यू.
जी.एम.वी.एन. बिल्डिग
74/1 राजपुर रोड, देहरादून ,उत्तराखण्ड

विषय :– **Regarding Issuance of NOC for Rnovation & Up-gradation works of Tourist Rest Houses at Badrinath.**

सन्दर्भः– आपका पत्रांक 156/ पी.आई. यू–जी.एम.वी.एन दिनांक 29.06.2016

महोदय,

उपरोक्त विषयक सन्दर्भित पत्र के क्रम में अवगत कराना है कि परियोजना कियान्वयन इकाई टूरिज्म (गढवाल) जी.एम.वी.एन. बदीनाथ स्थित पर्यटक (TRHs) भवन के आवासों की आवश्यक मरम्मत (भीतरी एवं साज–सज्जा) कार्य हेतु अनुमति प्रदान की जाती है।

(डा0सी.के.कविदयाल)
निदेशक/वन संरक्षक
नन्दादेवी बायोस्फियर रिजर्व,गोपेश्वर।

PIU-TOURISM (GARHWAL)

UTTARAKHAND EMERGENCY ASSISTANCE PROJECT
(Tourism Sector Program)
ADB LOAN No. 3055 - IND

INITIAL ENVIRONMENTAL EXAMINATION REPORT (IEER)

For

Renovation & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli
Package No. : UK/UEAP-T(GMVN)/DDN/09/ Lot C1/C2/C3/C4/C5/U1/U2U3/U4/U5/U6

The Program Manager
Project Implementation Unit (PIU),
Uttarakhand Emergency Assistance Project (Tourism Sector Program)
Garhwal Mandal Vikas Nigam Limited (GMVN),
74/1, Rajpur Road, Dehradun – 248001, UK

POINT WISE REPLIES OF QUERIES RAISED BY ADB DURING THE REVIEW OF IEE REORTS ON RENOVATION AND UPGRADATION OF ADDITIONAL DAMAGED TOURISM ASSETS IN DISASTER AFFECTED DISTRICTS UTTARKASHI & CHAMOLI, UTTARAKHAND

S.No.	Observations	Reply
1.	The IEE report prepared for the above works has confirmed (i) that except for the approach road in Badrinath that goes through the Nanda Devi Biosphere Reserve (NDBR) (Para 145 of IEE report), none of the other components of this sub-project were located inside or near designated core, buffer or eco-sensitive areas of national parks, sanctuaries, biosphere reserves, reserve forests, protected wetlands, or any other environmentally and/or ecologically sensitive areas; (ii) absence of rare, threatened, and endangered species (flora and fauna) within the zone of impact for these proposed works at all locations; and (iii) that none of the TRHs were located inside and/or near to protected monuments of archaeological importance. It is also noted that the proposed works are not expected to have any impact on the forests, and do not involve any tree cutting.	There is a correction to the statement made earlier in the IEE, the sites at Badrinath namely Travellers lodge and Yatri Niwas lie in the buffer zone of Nanda Devi Biosphere Reserve.
2	We request you to provide layout of the approach road passing though NDBR with the zone of NDBR (core, buffer and eco-sensitive) clearly marked. Further, please add a detailed note on the nature of works proposed within NDBR and environmental implications associated with such works including the applicable regulatory requirements. We note from the IEE report that the requisite applications have been submitted to the regulatory agencies for permissions. The table II-I (pertaining to applicable statutory environmental requirements for the sub-project) provided with the IEE report has stated "permissions not required", which needs to be corrected, and the table II-I shall also reflect the status of applications submitted to regulatory agencies. We further note that the IEE report has not provided any information about the other approach roads. Please provide the details of existing approach roads to the proposed sites with clear layout drawings. In case the existing approach roads need to be further strengthened or upgraded or if these roads need to be newly constructed, then please provide assessment of environmental implications related with the road works in the IEE report.	Layout drawings and map showing existing approach road and proposed sites in NDBR are provided in Annexure II and nature of works proposed are provided in Annexure III. REA checklist has been revised. Also "permissions not required" in table II -1 has been checked as Yes. It is not required for the other 9 sites. For the Badrinath sites, the details of initiating the process of seeking permission and its environmental implications are given in Annexure I consisting of "Due diligence note" and copies of permission seeking letters. The route used for transport of material to the place of work would be the main road to Badrinath shrine (NH-58), on which thousands of pilgrims travel on regular basis. There is no need for strengthening or upgrading the existing approach road nor any new road needs to be constructed.

2	We request you to provide layout of the approach road passing though NDBR with the zone of NDBR (core, buffer and eco-sensitive) clearly marked. Further, please add a detailed note on the nature of works proposed within NDBR and environmental implications associated with such works including the applicable regulatory requirements. We note from the IEE report that the requisite applications have been submitted to the regulatory agencies for permissions. The table II-1 (pertaining to applicable statutory environmental requirements for the sub-project) provided with the IEE report has stated "permissions not required", which needs to be corrected, and the table II-I shall also reflect the status of applications submitted to regulatory agencies. We further note that the IEE report has not provided any information about the other approach roads. Please provide the details of existing approach roads to the proposed sites with clear layout drawings. In case the existing approach roads need to be further strengthened or upgraded or if these roads need to be newly constructed, then please provide assessment of environmental implications related with the road works in the IEE report.	Layout drawings and map showing existing approach road and proposed sites in NDBR are provided in Annexure II and nature of works proposed are provided in Annexure III. REA checklist has been revised. Also "permissions not required" in table II -1 has been checked as Yes. It is not required for the other 9 sites. For the Badrinath sites, the details of initiating the process of seeking permission and its environmental implications are given in Annexure I consisting of "Due diligence note" and copies of permission seeking letters. The route used for transport of material to the place of work would be the main road to Badrinath shrine (NH-58), on which thousands of pilgrims travel on regular basis. There is no need for strengthening or upgrading the existing approach road nor any new road needs to be constructed.
3	The scope of work referred to in tables III-I page 23 and V-1 page 74 (renovation and up-gradation of existing TRHs with modern amenities, kitchen equipment, landscaping, and parking facilities) is not consistent with the details of works mentioned in Para 144 (the proposed LGFS, multipurpose hall, night shelter and meditation center are inside the premise of the existing TRH); Para 145 (since most of the sites are extension of existing TRHs); and Para 154 (the buildings will be constructed in vacant government lands). We note that for the TRHs in Badrinath only interior and furnishings related works would be undertaken and no fresh construction is proposed;	Corrected
4	The page 21 of table II-1 (pertaining to statutory environmental regulations) is repeated (same as page 19), and should be removed from the IEE report;	Page 21 has been removed.
5.	The reported forest area varies from 68% to 46% (36,651 km^2 to 24,508 km^2) in the IEE report (paragraphs 87 and table IV-3). This needs to be reported consistently as per the actual data;	Para 87 gives the reported forest area whereas table IV-3 is total forest cover, these are two different aspects.

6	The photographs provided under section VI-A Para 57 for the public consultations carried out at Hanuman Chatti /Syan Chatti on 16 May 2016 (page 84), at Purola on 17 May 2016 (page 85), and at Barkot on 18 May 2016 (page 86); and those provided in Annexure III (page 142) for consultations at Hanuman Chatti and Purola appear to be the same photograph. We request you to clarify in this regard;	They have been clarified, earlier were mistakenly placed, photographs of Purola and Gopeshwar have been correctly placed now.
7	Please replace the words "ambient air quality" by "ambient noise levels" in Para 78 line 10 and Para 79 line 1;	Replaced
8	The road related data provided in Para 113 pertains to period 2006-2007. This needs to be corrected with the data pertaining to period 2011-2012 provided in table IV- 13 page 65 to ensure consistency in reporting;	The road related data for the year 2013 has been provided and simultaneously the table IV-13 has also been changed to ensure consistency
9	The data pertaining to agriculture in Para 121 is for period 2001-2002 which needs to be in synchronization with the data provided in tables IV-14 page 64 and IV-16 page 70 for 2011-2012 period; and	Agriculture data upto the year 2012-2013 has been provided. This has been written in line with the NSDP.
10	The tourist related data provided in Para 130 is for period 2002-2003 (13 years old data). Please provide the latest data.	Tourist data for the year 2013 has been provided
11	We note that for implementation of some of the environmental mitigation measures specified under table VII-3 of IEE report (pages 104 to 118), the sources of funds are not stated and/or mentioned. Please update this table by clearly stating the source of funds. Please ensure that this updated table is made a part of the bid document so that the bidders are aware of their financial obligations in terms of the implementation of the environmental management and monitoring plans (EMMP).	The sources of funds have been stated.

ADB

Project Number: 3055-IND June: 2016

IND: Uttarakhand Emergency Assistance Project

Submitted by

Project implementation Unit, Tourism (Garhwal), UEAP, Dehradun

Asian Development Bank

Initial Environmental Examination

June: 2016

India: Uttarakhand Emergency Assistance Project (UEAP): Renovation and up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli, Uttarakhand.

Prepared by State Disaster Management Authority, Government of India, for the Asian Development Bank.

This initial environmental examination is a document of the State Disaster Management Authority, Government of Uttarakhand. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Abbreviations

ADB	Asian Development Bank
BOD	Biochemical Oxygen Demand
CO	Carbon Monoxide
CFE	Consent for Establishment
CH_4	Methane
CFO	Consent for Operation
DO	Dissolved Oxygen
dB	Decibel
IEE	Initial Environmental Examination
EA	Executing Agency
EIA	Environmental Impact Assessment
EC	Environmental Clearance
GoI	Government of India
GoU	Government of Uttrakhand
Ha	Hectare
H_2S	Hydrogen sulphide
HDPE	High Density Poly Ehylene
HFL	High Flood level
Km	Kilometer
Leq	Sound level
Mg	Milligram
MFF	Multitranche Financing Facility
MoEF & CC	Ministry of Environment, Forests & Climate Change
MLD	Million Litter Per day
Mn	Million
M	Meter
Mm	Millimeter
mg/l	Milligram per Liter
m^3	Cubic meter
NAAQM	National Ambient Air Quality Monitoring
NOx	oxides of Nitrogen
NA	Not Applicable
NGRBA	National Ganga River Basin Authority
OUR	Oxygen Uptake Rate
O & M	Operation and Maintenance
PMU	Project Management Unit
PVC	Poly Vinyl Chloride
PWD	Public Works Department
PIU	Project Implementation Unit
RCC	Reinforced Cement Concrete
RoW	Right of Way
RSPM	Respirable Suspended Particulate Matter
RP	Resettlement Plan
SEIAA	State Environment Impact Assessment Authority
SPCB	State Pollution Control Board
UEPPCB	Uttaranchal Environmental Protection and Pollution Control Board

SS	Suspended Solids
SBR	Sequential Batch Reactor
UEAP	Uttarakhand Emergency Assistance Project
UJS	Uttarakhand Jal Sanasthan
SPM	Suspended Particulate Matter
SO_2	Sulphur dioxide
ST	Scheduled Tribes
SC	Scheduled Castes
SOP	Standard Operational Procedures
UDD	Urban Development Department
UJS	Uttaranchal Jal Sansthan
U.P	Uttar Pradesh
UPCL	Uttaranchal Power Corporation Limited

WEIGHTS AND MEASURES

Cm	-	Centimeter
Crore	-	100 lakhs = 10,000,000
Lakh	-	100 thousand = 100,000
Km	-	Kilometer
Kph	-	Kilometer per hour
Lpd	-	liters per day
M	-	Meter
mg/l	-	milligrams per liter
Mm	-	Millimeter
MSL	-	Mean sea level
=		10^{-6} meter
$\mu g/m^3$	-	micrograms per cubic meter
=S/cm	-	micro Siemens per centimeter
NTU	-	Nephalo turbidity unit
Ppm	-	parts per million

NOTE{S}

In this report, "$" refers to US dollars. INR_and ₹_ refer to Indian rupees

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EXECUTIVE SUMMARY

1. Uttarakhand lies in the northern part of India amidst the magnificent Himalayas and dense forests. The State is bordering Himachal Pradesh in the north-west and Uttar Pradesh in the South and shares international borders with Nepal and China. The State is comprised of 13 districts divided into two regions and also called administrative divisions; the Kumaon and Garhwal.
2. Recent disaster of unprecedented floods in June, 2013 in the state of Uttarakhand, devastated many towns and villages on the banks of rivers Bhagirathi, Pindar, Mandakini, Alaknanda and Saryu. Infrastructure facilities like roads, power supply, communication, buildings, and water supply had been affected severely. Though the state government had taken up many steps to temporarily restore the facilities, it is envisaged to take up permanent measures to restore and rehabilitate the facilities.
3. Tourism was worst hit in the state with destruction of tourism infrastructure on one hand and loss of livelihoods on the other. The tragedy besides claiming thousands of lives badly hit the industry stakeholders especially, those involved in religious and adventure tourism on account of the major portion of the season of the chardham yatra being washed out. According to estimates from the Uttarakhand Hotel and Restaurant Association, the floods washed away over 100 small hotels which were constructed right on the riverbanks. Uttarakhand Tourism Department' Assets run by Garhwal Mandal Vikas Nigam (GMVN) at various locations viz TRH Rambara, TRH Syalsaur, TRH Chandrapuri were washed away and TRH Kedarnath, Gaurikund, Guptkashi, Tilwara & Jakholi and public toilets located in various locations suffered heavy damages due to flash floods incessant rain and landslides. The tragedy also brought realization that the mushrooming of hotels along river banks was triggered by tourist boom and contrary shortage of accommodation / dwelling units to meet the ever-increasing numbers of tourists. This also contributed to the mushrooming of illegal structures, some of which were constructed right on the riverbanks.
4. As a part of Tourism Restoration Drive, reconstruction and rehabilitation of damaged tourism assets in disaster affected Chamoli and Uttarkashi districts run by GMVN are proposed, so as to compensate for the loss of tourist accommodation and to provide improved accommodation facilities to the tourist / pilgrims visiting this area.
5. Consistent with the Environmental Assessment and Review Framework, the proposed subproject were screened using ADB rapid environmental assessment (REA) checklist-General (Tourism). The environmental screening revealed that only 2 sites out of 11 in the subproject at Badrinath lies in the new buffer zone of Nanda Devi Biosphere Reserve (NDBR), since the works to be done are minor works of renovation and no new construction or expansion works are to be done they will not have any serious environmental impact. All impacts are site specific; few are irreversible and can be readily mitigated supporting an environmental Category B classification.

6. **Air Quality**. The pristine environment and sparse population suggest that most part of the State have a very good air quality while noise level is calm except in central part of the Uttarkashi and Chamoli town. The baseline of air quality and noise level will be generated before commencement of the construction.
7. **Seismicity**. The State constitutes one of the most active domains of the Himalayan region. Several damaging earthquakes are recorded from this region. As such, the region is classified under high seismic zone IV & V.
8. **Forest.** Uttarakhand is ranked 9th in all-India in terms of forest covered area with 24,508 km^2 of forestland The district of Pauri Garhwal, Uttarkashi, Nainital, and Chamoli have the largest forest cover accounting for 50% of all the state's total. The State Govt. of Uttarakhand has declared the oak tree (*Quercus* sp.) as a *Kalpvriksha* or wish fulfilling divine tree often treated as the signature plant of the Kumaon Himalayas as numerous logos and insignias with a stylized version of the deodar inscribed on them.
9. **Sensitive Ecosystem:** The subproject location does not fall within any sensitive ecosystem except for **Travellers Lodge and Yatri Niwas at** Badrinath that falls in the new buffer zone (area increased in 2000) of Nanda Devi Biosphere Reserve. The area of buffer zone is 5,148.6 sq km. It surrounds the core zone on all sides. Services and activities are managed in a way that protects the core zone. There are 47 villages in the buffer zone. The services and activities include restoration, sites for enhancing value addition to the resources, limited recreation, tourism, grazing, etc., which are permitted to reduce its effect on core zone. PIU tourism has sought permission from Director, Nanda Devi Biosphere Reserve (NDBR) and Divisional Forest Officer (DFO), Chamoli district for the renovation/upgradation works in Badrinath vide letter no. 156/PIU–GMVN Tourism (Garhwal) dated 29/6/16 and 150/PIU-Tourism (Garhwal) dated 25/6/16 respectively. The contractor will be mobilized only after obtaining the requisite permission. The route used for transport of material to the place of work would be the main road to Badrinath shrine (NH-58), on which thousands of pilgrims travel on regular basis.(Layout map attached as annexure-II). There is no need for strengthening/ upgrading the existing approach road or constructing any new road.
10. The subproject involves only repair of boundary wall and gate, furnishing works of rooms like dining area, reception, kitchen and kitchen equipments. It also includes signage and internal electrification works at both sites of Badrinath. As the nature of work is repairing and furnishing of the existing facilities at Yatri Niwas (existing since 1993) and Travelers421dsf Lodge (existing since 1972) in Badrinath, it does not involve any fresh construction and no heavy machinery is required, hence no major environmental impacts are anticipated.

11. **Significant Environmental Impacts and Proposed Mitigation Measures.** No environmental impacts related to siting were identified in the environmental examination. All components of subproject are existing, no components of subproject is located inside or near a cultural heritage site, protected area, wetland, mangrove, estuarine, buffer zone of protected area or special area for protecting biodiversity. There are no rare, threatened, and endangered species (flora and fauna) within the subproject corridor of impact. The potential significant environmental impacts identified and assessed are related to construction time impacts.
12. **Information Disclosure, Consultation, Participation, and Grievance and Redress Mechanism.** Wide stakeholder consultation and participation was observed during the environmental examination of UEAP. Project affected communities, government institutions, and non-governmental organizations. Highlight of all consultations were documented and applicable recommended measures particularly in minimizing shifting of structures, potential conflict with migrant workers, and competing demand for local resources were incorporated in the design and the environmental management plan. This IEE report will be disclosed in the ADB website pursuant to the Bank's *Public Communication Policy* and in the SDMA website.
13. **Environmental Management Plan**. The Environmental Management and Monitoring Plan (EMMP), to form part of the bidding documents, adopted the procurement package scheme and facilitate subsequent compliance monitoring by the contractor.
14. **Conclusion.** In the present IEE certain baseline data is not available for water, noise, air and soil quality. Therefore it is proposed that before the start of works baseline data will be generated by the civil work contractor.

1. Introduction

A. Project Background/Rationale

15. Recent disaster of unprecedented floods in June, 2013 in the state of Uttarakhand, devastated many towns and villages on the banks of rivers Bhagirathi, Pindar, Mandakini, Alaknanda and Saryu. Infrastructure facilities like roads, power supply, communication, buildings, and water supply had been affected severely. Though the state government had taken up many steps to temporarily restore the facilities, it is envisaged to take up permanent measures to restore and rehabilitate the facilities.

B. THE UTTARAKHAND EMERGECY ASSISTANCE PROJECT (UEAP)

16. Uttarakhand being a tourist and pilgrimage State attracts a large number of tourist and pilgrims. A major disaster during 15-17 June 2013 resulted in severe damages in 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.

Based on the request of India, a Rapid Joint Damage and Needs Assessment (RJDNA) was undertaken by Asian Development Bank (ADB) and the World Bank (WB). ADB agreed to assist the Government of India (GOI) with reconstruction and rehabilitation efforts for which the Uttarakhand Emergency Assistance (Sector) Project (UEASP) has been formulated as a multi-sector emergency loan in sector loan modality. The executing agency (EA) for the UEASP will be Government of Uttarakhand (GOU) and State Disaster Management Authority (SDMA). The primary implementing agencies (IA) will be Public Works Department (PWD) for roads, bridges, urban road, and trekking routes including eco-trails Department of Tourism (DOT) through Kumaon Mandal Vikas Nigam Limited, and Garhwal Mandal Vikas Nigam Limited for tourism infrastructure, Uttarakhand Civil Aviation Development Authority (UCADA) for helipads; and Uttarakhand Jal Sansthan (UJS) for urban water supply, or any successor hereto.

C. Purpose of the Environmental Assessment

17. The purpose of the study is to identify the environmental issues to be considered at project planning and design stage, assesses environmental consequences due to project intervention and suggests mitigation measures to minimize the adverse environmental impacts, if any, associated with construction and operation.

Initial environmental examination (IEE) has four basic objectives; (i) asses relevant potential impacts and risks associated with the proposed reconstruction and rehabilitation of damaged tourism assets, (ii) assess the compliance with ADB environmental safeguard requirements and

applicable environmental laws, (iii) incorporate mitigation measures in the project design, (iv) preparation of environmental management and monitoring plan.

D. Extent of IEE

18. IEE was conducted based on preliminary Detailed Design Report (DPR). The IEE covers all activities proposed under the project. The corridor of impact is taken as direct impact of the new construction or reconstruction or rehabilitation of the project component. IEE also covers the direct impact of the sub-project component. Assessment is carried out for all components of environment covering terrestrial and aquatic ecology, soil, water, noise and socio economic aspects.

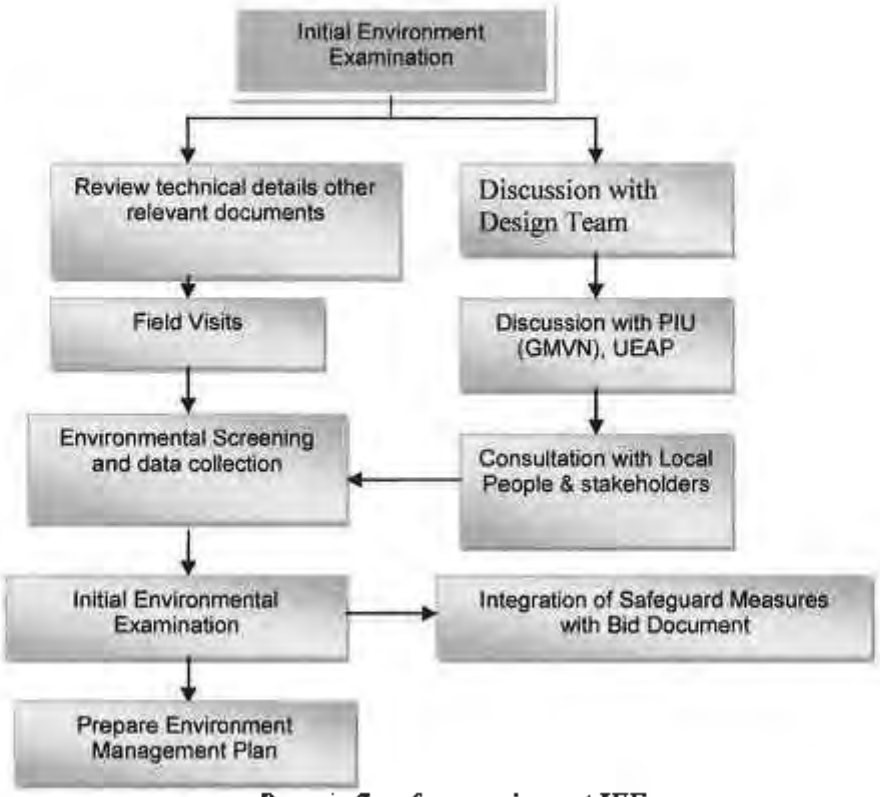
E. IEE Content

19. The IEE has been largely structured as per SPS, 2009 ADB's Environmental Assessment Guidelines (2003) and environmental safeguards- A Good Practice Source Book (December 2012). This includes following eight chapters including this introduction Chapter.

1. Chapter 1- Introduction
2. Chapter 2- Policy, Legal and Administrative Framework
3. Chapter 3- Description of Project
4. Chapter 4- Description of Environment
5. Chapter 5- Anticipated Impacts and Mitigation Measures
6. Chapter 6- Information Disclosure, Consultation, and Participation
7. Chapter 7- Environment Management Plan and Grievance Redress Mechanism
8. Chapter 8 Conclusion and Recommendation

F. Methodology

20. The following key steps were followed in this study: review of legal requirements, reconnaissance survey for identification of key issues data requirement and preliminary consultation, primary and secondary data collection, impact assessment, consultation with stakeholders, identification of impacts and mitigation measures, and institutional review.



Process flow for carrying out IEE

G. Public Consultation

21. Extensive consultations were held with all stakeholders's that includes: local residents, govt. departments/ agencies, other water users, and NGOs with intent to collect baseline information, for better understanding of the potential impacts and appreciate the perspectives/concerns of the stakeholders. Key information gathered were integrated in project design and used in formulating mitigation measures.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

22. The legal framework of the country consists of several acts, notifications, rules and regulations to protect environment and wildlife. In 1976, the 42nd Constitutional Amendment created Article 48A and 51A, placing an obligation on every citizen of the country to attempt to conserve the environment. Specifically for the UEAP, the following environmental laws and regulations are applicable:

Table II-1 Applicable Environmental National and State Requirements for UEAP

S. No	Clearances	Acts/rules/ Notification/guideline and Application to road Projects	Concerned Agency	Applicable to contract package	Responsibility	Status of Compliance
	A. Pre -Construction Stage					
1.	Environment Clearance	EIA Notification, 2006 amended till date, promulgated under Environment (Protection) Act 1986 The Notification and its latest amendment entails requirement of prior environmental clearance to the projects listed in schedule of this notification	State Environmental Impact Assessment Authority (SEIAA). If not constituted then MoEF	No	F-PIU, GMVN	Not required
2.	Forest Clearance for felling of trees and acquisition of forest land for widening.	Forest Conservation Act (1980): i) If the forest land exceeds 20 hectare then prior permission of Central Government is required; ii) if the forest and is between 5 to 20 hectare, then permission form the Regional Office of Chief Conservator is required; iii) If the forest land is below or equal to 5 hectare the State Government can give permission. If the construction area is more than 40% forest, permission to undertake any work is needed from the Central Government, irrespective of the size of the area.	District Level Committee constituted by the State Govt.	No	F-PIU, GMVN	Not required

S. No	Clearances	Acts/rules/ Notification/guideline and Application to road Projects	Concerned Agency	Applicable to contract package	Responsibility	Status of Compliance
3.	Permission for working in protected area	The Indian Wildlife (Protection) Act, 1972, amended 1993, The Wild Life (Protection) Amendment Act, 2002. This Act provides guidelines for protection of Wild animals, birds and plants and for matters connected therewith or ancillary or incidental there to. It also states the norms for hunting of wild animals, prohibition of picking, uprooting, etc., of specified plants. The Act deals with the declaration of area as Sanctuary, National Park, and closed area and also states the restriction of entire in the sanctuary.		Yes	F-PIU, GMVN	Permission seeking from Director NDBR has been initiated for 2 sites at Badrinath. Not Required for other 9 sites.
4.	Permission for working in protected area.	The Ancient Monuments and Archaeological Sites and Remains Act, 1958, and the rules, 1959 provide guidance for carrying out activities, including conservation, construction and reuse in and around the protected monuments.		No	F-PIU, GMVN	Not Required
	B. Construction Phase					
1	1. Discharge of waste water	The Water (Prevention and Control of Pollution) Act 1974 and The Water (Prevention and Control of Pollution) Rules 1975 The Act and Rules outlines the activities which are prohibited on account of their potential to cause water pollution. Pollution from various sources need to be controlled as per this Act and rules.	Uttarakhand Environmental Protection and Pollution Control Board (UEPPCB)	No	Contractor	Not Required
2.	Permission for Sand Mining from river bed	Mines and Minerals (Regulation and Development) Act, 1957 as amended in 1972.	Directorate of Mining and Geology, Uttarakhand	No	Contractor	Not Required

S. No	Clearances	Acts/rules/ Notification/guideline and Application to road Projects	Concerned Agency	Applicable to contract package	Responsibility	Status of Compliance
3.	Consents to Establish & operate Hot mix plant, Crushers, Batching	Air (Prevention and Control of Pollution) Act 1981	UEPPCB	No	Contractor	Not Required
4.	Authorization for Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989 as amended 2003	UEPPCB	No	Contractor	Not Required
5	Consent for Disposal of Sewage from Labour camps	Water (Prevention and Control of Pollution) Act 1974	UEPPCB	No	Contractor	Not Required
6.	Use of Fly ash within 100 kms around Thermal Power plant	Fly Ash Notification, 1999 as amended up to 17th August 2003;	MOEF and CC	No	Contractor	Not Required
7.	Pollution Under Control Certificate	Central Motor and Vehicle Act 1988	Department of Transport, Govt. of Uttarakhand	Yes	Contractor	
8.	Installation of Generators	The Air (Prev. & Con. of Pollution) Act, 1980	UEPPCB	Yes	Contractor	
9	Employing Labour/workers	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.	District Labour Commissioner	Yes	Contractor	

S. No	Clearances	Acts/rules/ Notification/guideline and Application to road Projects	Concerned Agency	Applicable to contract package	Responsibility	Status of Compliance
10	Permission for extraction of boulder and sand from river	Mines & Minerals (Regulation and Development) Act, 1957 and its amended in 1972	Directorate of Mining and Geology, Uttarakhand	No	Contractor	
11..	License for Storing Diesel and other explosive.	Petroleum Rules, 2002. Hazardous Waste (Management and Handling) Rules 1989.	Commissioner Explosives	No	Contractor	
	C. Implementation Stage					
12	Consent to Establish & Consent to Operate	The Air (Prev. & Con. of Pollution) Act, 1980, Water Prevention and Control of Pollution) Act 1974.	UEPPCB	Yes	F-PIU GMVN	

Table: III -1 DESCRIPTION OF THE PROJECT

A. Project Location

a. Chamoli

S.No	Location	Nature of work Proposed	Remarks
1	Kaleshwar	Renovation and Upgradation of 92 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved/ better facilities to Tourist.
2	Gopeshwar	Renovation and Upgradation of 24 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved/ better facilities to Tourist.
3	Adibadri	Renovation and Upgradation of 18 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved/ better facilities to Tourist.
4	Travellers's Lodge Badrinath	Renovation and Upgradation of 32 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved/ better facilities to Tourist.
5	Yatri Niwas, Badrinath	Renovation and Upgradation of 500 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved/ better facilities to Tourist.

b: **Uttarkashi**

S.No	Location	Nature of work proposed	Remarks
1	TRH Syanachatti	Renovation and Upgradation of 18 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist.
2	TRH Purola	Renovation and Upgradation of 38 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist.
3	TRH Hanuman Chatti	Renovation and Upgradation of 32 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping. parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist
4	TRH Barkot	Renovation and Upgradation of 20 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist
5	TRH Barkot (Annexy)	Renovation and Upgradation of 4 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist
	TRH Maneri	Renovation and Upgradation of 28 bed existing TRH with kitchen with modern amenities, Kitchen equipments, landscaping, parking facilities etc. in order to provide improved accommodation facilities to tourist.	To provide improved / better facilities to Tourist

Figure 1.: Showing Proposed location for renovation and up gradation of tourism infrastructure in District Chamoli.

Figure 2.: Showing Proposed location for renovation and up gradation of tourism infrastructure in District Uttarakhi

B. Proposed Category of the Project

23. Pursuant to the requirements of the ADB Safeguard Policy Statement (2009) proposed renovation and up gradation of tourism infrastructure in District Chamoli and Uttarkashi was screened to identify significance of potential impacts, determine the environmentally sensitive component, establish the needed level of assessment, and prescribe the information disclosure and consultations requirement to be complied by the GMVN Consistent with the Environmental Assessment and Review Framework, the subproject was screened using the ADB rapid environmental assessment (REA) checklist- General (Tourism).

24. The environmental screening revealed that no protected or sensitive areas were traversed for 9 sites. However, the sites at Badrinath are located inside the buffer zone of Nanda Devi Biosphere Reserve. There are no rare, threatened, and endangered species (flora and fauna) within the subproject corridor of impact. All impacts are site specific, and all impacts can be readily mitigated supporting a category B classification.

C. Background of the Proposed Sub-project

24. Tourism was worst hit in the state with destruction of tourism infrastructure on one hand and loss of livelihoods on the other due to heavy rains in June, 2013. The tragedy besides claiming thousands lives badly hit the industry stakeholders especially, those involved in Religious and Adventure Tourism on account of the major portion of the season of the Char Dham Yatra being washed out. According to estimates from the Uttarakhand Hotel and Restaurant Association, the floods washed away over 100 small hotels which were constructed right on the riverbanks. Uttarakhand Tourism Department's Assets run by G.M.V.N. at various locations viz TRH Rambara, TRH Syalsaur, and TRH Chandrapuri were washed away and TRH Kedarnath, Gaurikund, Guptkashi, Tilwara & Jakholi and public toilets located in various locations suffered heavy damages due to flash flood incessant rain and landslides.

25. As a part of Tourism Restoration Drive, it was decided by the Govt. of Uttarakhand that Uttarakhand Tourism Department's Assets run by G.M.V.N., damaged during disaster June 2013 in Chamoli and Uttarkashi district be reconstructed/restored/redeveloped/rehabilitated so as to compensate for loss of tourist accommodation and to provide improved accommodation facilities to the tourist/pilgrims visiting Badrinath. Now it is proposed to take up renovation/upgradation of damaged tourist assets in Uttarkashi and Chamoli, which were not be taken up in the 1st phase as the required funds are also available under the projects, in order to provide improved accommodation facilities to the tourist visiting shrines Char Dham in Garhwal region. The following assets run by GMVN are proposed to be undertaken for upgradation/Renovation works.

D. Sub project Description

1. Syanachatii

26. One of the beautiful spots to absorb the beauty of nature, Syanachatti is situated at an elevation of 2,015mts above sea level on the Barkot-Yamunotri Road in the Uttarkashi district of Uttarakhand at a distance of 22kms before Yamunotri. Sayanachatti is frequently visited by tourists in search of peace and tranquility. The place is a perfect destination to take a break from the hectic city life and enjoy some mesmerizing moments in the lap of nature. The place has been abundantly blessed by natural beauty.

27. A 18 bedded TRH at Syanachatti suffered partial damages during the disaster, hence it is proposed to renovate/upgrade the existing TRH with modern amenities, in order to provide improved accommodation facilities to tourist visiting Yamunotri Shrine.

TRII Syanachatti

2. Purola

28. Purola is quaint little town situated at an altitude of 1,524 mt, above sea level in north-west region of Uttarkashi district 112 km's from Uttarkashi. It is on the way to Har-ki-dun trek and is surrounded by mountain ranges and the Govind Wildlife sanctuary. The park occupies an area of 957.968 sq. km's. It houses a whole lot of endangered species within its premises with the most important of these being, Snow Leopard. It is popularly known as the gateway to Har-ki-Doon as it is situated on its way. It is the largest town situated near to Har-ki-Doon. Purola is surrounded by lush green mountains and Govind Wildlife Sanctuary. The picturesque views and serene environs of make Purola an ideal destination to rejuvenate. Purola is untouched by the rapid development of the hill stations and is a quaint little place

29. A 38 bedded TRH at Purola was damaged during the disaster; hence it is proposed to renovate/upgrade the existing TRH with modern amenities, in order to provide improved accommodation facilities to tourist visiting Yamunotri Shrine.

TRH PUROLA

3. Hanumanchatti

30. Hanuman Chatti is located at the confluence of the Hanuman Ganga and Yamuna rivers. Situated 13 kms before Yamunotri Dham, Hanuman Chatti (2,400mts) is a serene place offering ample amount of accommodation facilities. The river side scenic beauty at Hanuman Chatti acts as a perfect place to experience nature and countryside.

31. HanumanChatti is frequented by travelers because it is a popular trekking spot in the region. Apart from Yamunotri the best trekking excursion of Hanumanchatti is towards Darwa Top and Dodi Tal.

Hanumanchatti used to be the starting point of the trek to reach Yamunotri but now motorable roads are made up to Janki Chatti, thus shortening the distance by 7 kms. Large number of travelers and devotees visit Hanuman Chatti from May to October.

32. A 32 bedded TRH at Hanumanchatti suffered minor damages during the disaster; hence it is proposed to renovate/upgrade the existing TRH with modern amenities, in order to provide improved accommodation facilities to tourist visiting Yamunotri

TRH Hanumanchatti

4. Barkot

33. Barkot is a small town located at 30.82°N 78.20°E of Uttarkashi District in the stat of Uttarakhand, India. It is located on the banks of the Yamuna river. Barkot is located nearl west side to Uttarkashi. It has an average elevation of 1,220 metres (4,003 feet). As of 2001 India census, Barkot had a population of 16,568. Males constitute 53% of the population and females 47%. Barkot has an average literacy rate of, higher than the national average of 84.5%; with 93% of the males and 77% of females literate. 54% of the population is under 6 years of age.

34. A 20 bedded TRH Barkot and 4 bedded TRH barkot (Annexy) at Barkot suffered mino damages during the disaster; hence it is proposed to renovate/upgrade the existing TRH wit modern amenities, in order to provide improved accommodation facilities to tourist visiting.

TRH Barkot

TRH Barkot (Annexy)

5. Maneri

35. Maneri is on the way to Gangotri from Uttarkashi, 13 km from the base camp at Uttarkashi. Maneri has very recently developed as a popular tourist attraction because of the dam on the Bhagirathi River. Water is received via an 8 km long tunnel to the turbines at Tiloth. As a result, a lake has been formed at Maneri which attracts people. Maneri is a medium size village located in Bhatwari of Uttarkashi district, Uttarakhand with total 299 families residing. The Maneri village has population of 1271 of which 697 are males while 574 are females as per Population Census 2011. In Maneri village population of children with age 0-6 is 165 which makes up 12.98 % of total population of village. Average Sex Ratio of Maneri village is 824 which is lower than Uttarakhand state average of 963. Child Sex Ratio for the Maneri as per census is 941, higher than Uttarakhand average of 890.

36. Maneri village has higher literacy rate compared to Uttarakhand. In 2011, literacy rate of Maneri village was 86.17 % compared to 78.82 % of Uttarakhand. In Maneri Male literacy stands at 95.92 % while female literacy rate was 74.09 %. As per constitution of India and Panchyati Raaj Act, Maneri village is administrated by Sarpanch (Head of Village) who is elected representative of village.

37. A 28 bedded TRH at Maneri which was constructed in May 2014, is proposed to be renovated/upgraded by making provisions for furnishing the TRH, kitchen equipments, landscaping, parking facilities etc in order to provide improved accommodation facilities to tourist visiting Gangotri Shrine.

TRH Maneri

Proposed Project Area in the district Chamoli

6. Kaleshwar

38. Kaleshwar is a beautiful village located at the left bank of Alaknanda River and is 5 km from Karanprayag. It is enroute to one of the holiest shrine in Hindu mythology "Badrinath Dham" which is 120 km from Kaleshwar.

TRH Kaleshwar

39. A 92 bedded TRH at Kaleshwar suffered minor damages during the disaster, hence it is proposed to renovate/upgrade the existing TRH with modern amenities in order to provide improved accommodation facilities to tourist visiting Badrinath Shrine and Hemkund Saheb.

7. Gopeshwar

40. Gopeshwar is located at 30.42°N 79.33°E. It has an average elevation of 1,293 m (4,242 ft). Gopeshwar is said to be able to captivate any visitor with its mystic charm and pristine beauty. There are many snow-capped hills and peaks that can be witnessed from Gopeshwar.

41. Gopeshwar is a township in Garhwal hills and a municipal board in Chamoli district. It is the administrative headquarters of the Chamoli District of Uttarakhand in India. Located 1400 meters above sea level, it is famous for its weather (pleasant most of the year, but very cold in December and January) and its temples. It is largest town in Chamoli district. Famous places at Gopeshwar are Pt. Deendayal Park, Kunds, Gopinath temple, telephone tower house. The only T.B. Hospital in Chamoli district is situated here. A sports stadium in the form of the land forming part of police ground is also situated here. Major colonies are PWD colony, Jal Nigam, Wireless colony, police colony, kund colony, post office, basant bihar, saraswati bihar, subhash nagar, haldapani, negwar, Mandir colony, teacher colony, hospital colony, polytechnic colony.

TRII Gopeshwar

42. A 24 bedded TRII at Gopeshwar suffered minor damages during the disaster, hence it is proposed to renovate/upgrade the existing TRII with modern amenities in order to provide improved accommodation facilities to tourist visiting Badrinath and Hemkund Saheb.

8. Adibadri

43. Adi Badri, one among the Panch Badri pilgrimages in Dev Bhoomi Uttarakhand state of India is a group of 16 temples with the main Narayan temple dedicated to lord Vishnu situated 17Km from Karnaprayag in Uttarkashi district. As the name suggests, Adi or Aadi Badri is the ancient abode of lord Vishnu who is called with the name 'Badri' in Badrikshetra – Uttarakhand state. It is believed that lord Vishnu resided in Adi Badri during Satya, Treta and Dwapar Yugas (eras) and shifted to Badrinath in Kali Yuga. Prophecy says, lord Vishnu will shift his abode to Bhavishya Badri in Satya Yuga after completion of the running era– Kali Yuga.

44. First Badri abode among Sapta Badri and one among the Panch Badri, Adi Badri bestowes religious significance and is visited by thousands of pilgrims every year. Religious significance of Adi Badri is heightened with a belief that Maharshi Veda Vyas (the sage who divided Veda

into four Vedas namely Rigveda, Samveda, Yajurveda and Atharvaveda) wrote Shree M Bhagwat Geeta (delivered by the God himself) at Adi Badri. Adi Badri pilgrimages are situat 3,133 meters above sea level.

45. Adi Badri pilgrimages' construction was initiated by Aadi Guru Shankaracharya in t 8th century. Every year in the Akshya tritiya of Baisakh (April-May) month of Hindu c'lend there is a huge gathering of pupils to pay devotional visit to Adi Badri. On Kartik (Novemb December) Purnima (full moon day) of Hindu calendar, huge mass gather to participate Kapal Mochan fair in Adi Badri. The devotees take holy dip in Kapal Mochan kund, worship t idols in temples and celebrate the fair.

46. Among the 16 temples in Adi Badri premises, Narayan temple dedicated to lord V. .nu considered as the main temple. A raised pyramidal platform distinct the Narayan temp fr other temples in Adi Badri. A temple dedicated to lord Shiva, another dedicated to Mant'a D and a Kund in the premises is considered as the origin point of Saraswati river are the m honored Dhams (pilgrimages) in Adi Badri.

47. It is believed that Saraswati River originates from Adi Badri. Rigveda states that Saraswa River is "the one who goes pure from the mountains as far as the sea".

48. A 18 bedded TRH at Adibadri which was constructed in May 2014, is propose. to renovated/upgraded by making provisions for furnishing of TRH, kitchen equi ner landscaping, parking facilities etc in order to provide improved accommodation faci'ies tourist from Kumaon region visiting Badrinath and Hemkund Sahib.

Adibadri

9. Badrinath

49. Badrinath is a holy town and a Nagar Panchayat in Chamoli district in the st of Uttarakhand, India. It is the most important of the four sites in India's Char Dham pil_ ima and gets its name from the Holy temple of Badrinath.

50. The Badrinath temple is the main attraction in the town. According to legend Shankara discovered a black stone image of Lord Badrinarayan made of Saligram stone in the Alaknanda River. He originally enshrined it in a cave near the Tapt Kund (hot springs). In the sixteenth century, the King of Garhwal moved the murti to the present temple. The temple is approximately 50 ft (15 m) tall with a small cupola on top, covered with a gold gilt roof.[The facade is built of stone, with arched windows. A broad stairway leads up to a tall arched gateway, which is the main entrance. The architecture resembles a Buddhist vihara (temple), with the brightly painted facade also more typical of Buddhist temples. Just inside is the mandapa, a large pillared hall that leads to the garbhagriha, or main shrine area. The walls and pillars of the mandapa are covered with intricate carvings

Traveller's Lodge, Badrinath

Yatri Niwas, Badrinath

51. A 32 bedded Travellers lodge and 500 bedded Yatri Niwas at Badrinath, suffered minor damages during the disaster, hence it is proposed to renovate / upgrade the existing TRH with modern amenities in order to provide improved accommodation facilities to tourist visiting Badrinath Shrine.

E. Project Implementation Schedule

52. The implementation period for the UEAP is around 3 years with a construction period of aroun 3 years. All UEAP components are expected to be completed by December 2017.

TECHNICAL FEATURES:

A) Seismic resistant structure:

53. The works under the project are proposed to be designed as per norms/direction recommended by Govt. of India such as BIS, Forest conservation act, ADB safeguard policy (Environment) Union Government's lows policies and regulation, sate Govt. policies safeguard policies.

The design elements which will be addressed during the design process will be false ceili design colour schemes of the entire room's courtesy different finishes available acrylic pain emulsion, wall paper, micas teak ply and fabricates etc. furthermore the design of furniture along with the quality and texture of fabric will be taken care of an addition to this at some places different type of lightning along with fixture will also be used to generate a special ambience.

- Testing standards:

As specified in Design code AS/NZS 4600:2005 (Steel Structure Buildings LGFS) To determin the Load Bearing Capacity of the structural strength the following tests are conducte Compressive Strength (N/sq mm), Strength in axial (Tension)(N), Strength in bendin (Compression) (N/sq mm), Strength in axial (N).

IV DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

54. This section presents a brief description of the existing environment, including its physical, ecological resources, and socio-economic development of Sub project of Chamoli and Uttarkashi . Broad aspects on various environmental parameters such as geography, climate and meteorology, physiography, geology, seismology, ecology, socio-cultural and economic development parameters that are likely to be affected by the proposed rehabilitation and reconstruction of damaged tourism assets in Chamoli and Uttarkashi are presented. Secondary information was compiled from relevant government agencies like the Forest Department, Wildlife Department, State Environment Protection, and Pollution Control Board and Metrological Department.

i. Geography

55. Uttarakhand lies in the northern part of India amidst the magnificent Himalayas and dense forests. The State is bordering Himachal P radesh in the north-west and Uttar Pradesh in the South and shares international borders with Nepal and China. The State is comprised of 13 districts, these are; Pithoragarh, Almora, Nainital, Bageshwar, Champawat, Uttarkashi, Udham Singh Nagar, Chamoli, Dehradun, Pauri, Tehri Garhwal, Rudraprayag, and Haridwar. Geographically, the state lies in the northern Himalayas between 28^0 53' 24" to 31^0 27 50" North latitude and $77^0$34"27' to $81^0$0 2^0 22" East longitude. The State has an area of 53,484 sq. km. and a population of about 8.48 million as per census 2001.

Figure IV-1 Districts of Uttarakhand

56. Uttarakhand is divided into two regions and also called administrative divisions, basically following terrain: the Kumaon and Garhwal. The Kumaon division located southeast of the state and composed of Almora, Bageshwar, Champawat, Nainital, Pithoragarh, and Udham Singh Nagar. The Kumaon region is part of the vast Himalayan track and and the sub-mountains of

Terai and Bhabhar. The region is drained by Gori, Dhauli, and Kali from the Tibeta.. mountains, and Pindari and Kaliganga which ultimately joins Alaknanda River. The Garwha division is composed of Chamoli, Uttarkashi, Rudraprayag, Tehri Garhwal, Pauri, Dehradur and Haridwar districts.and is entirely on rugged mountain ranges dissected by valley, and deer gorges. The Alaknanda River, the main source of the Ganges, traces its headwaters in this region.

57. The State is part of the Western Himalaya is further divided into four zones namely, the Tarai-Bhabar-Shivalik (Sub-Himalayas), Lesser-Himalayas, Greater-Himalayas, and Trans Himalaya (Tethys).

About District Chamoli:

58. Chamoli district is the second largest district of Uttarakhand state of India. It is bounded by the Tibet region to the north, and by the Uttarakhand districts of Pithoragarh and Bageshwar to the east, Almora to the south, Garhwal to the southwest,Rudraprayag to the west, and Uttarkashi to the northwest. The administrative headquarters of the district is Gopeshwar. Chamoli hosts a variety of destinations of pilgrim and tourists' interest. Badrinath, Hemkund Sahib, Valley of Flowers and Auli. Chamoli also happened to be a birthplace of "Chipk movement". Chamoli proved itself "the most spectacular in its natural assets; be it scenery valley aspects, water-edges, floristic varieties, dramatic landform or the climatic cardinalities" The district is also inhabited by Bhotiya ethnic group who adhere to Hinduism.

59. According to the 2011 census Chamoli district has a population of 391,114 roughly equal to the nation of Maldives.[3] This gives it a ranking of 559th in India (out of a total of640). The district has a population density of 49 inhabitants per square kilometre (130/sq mi). Its population growth rate over the decade 2001-2011 was 5.6%. Chamoli has a sex ratio of 1021 females fo every 1000 males,[2] and a literacy rate of 83.48%.

About District Uttarkashi:

60. Uttarkashi District is a district of Garhwal division of the Uttarakhand state northern India, an has its headquarters atUttarkashi city. It has six Tehsils named after Badkot, Bhatwadi, Chinya Sour, Dunda, Purola, Mori. Uttarkashi District town lies high in the Himalaya range, and the district contains the source of both the Ganges and Yamunarivers, which attract thousands of Hindu pilgrims. The town lies on the main route to Gangotri, has many Hindu temples, and is also considered an important Hindu pilgrimage centre. The district is bounded on the nort by Himachal Pradesh state, on the northeast by Tibet, on the east by Chamoli District, on th southeast by Rudraprayag District, on the south by Tehri Garhwal District, and on the we by Dehradun District.

61. According to the 2011 census Uttarkashi district has a population of 329,686, roughly equal to the nation of Belize. This gives it a ranking of 567th in India (out of a total of 640). The district has a population density of 41 inhabitants per square kilometre (110/sq mi Its population growth rate over the decade 2001-2011 was 11.75%. Uttarkashi has a sex ratio of 959 females for every 1000 males, and a literacy rate of 75.98%.

ii. **Geology**

62. The geology of the region shows that the Himalayas are the young mountains in the world. During early Mesozoic times, or the secondary geological period, the land mass now covered by them was occupied by the great geosynclinal Tethys sea . The probable date of the commencement of the elevation of the Himalayas is about the close of the Mesozoic period, but the unraveling of the story of their structure has only just begin, and in many cases no dating of the rocks is yet possible, though they include ancient and relatively recent crystalline intrusive, rocks and sediments allied to the peninsular part of India. The section of the range in the district is deeply cut into by the headwaters of the Alaknanda river, this trunk stream seeming to have reached a latter stage of development than its tributaries. This much, however, is known that there has been intense metamorphosis. In some parts uplift has been considerable since the midpleistocene period, in others there are great stretches of high but subdued topography and elsewhere there are the deepest gorges.

Geologically, Chamoli and Uttarkashi district comprises of diverse rock types ranging in age from Palaeoproterozoic to Mesoproterozoic in age.

63. The rock sequences exposed between Main Boundary Fault (MBF) and Main Central Thrust (MCT)- Constituting the Lesser Himalaya. The rock sequences exposed to the north of Main Central Thrust (MCT) Constituting the Higher Himalaya The rock sequences exposed between Main Boundary Fault (MBF) and Main Central Thrust (MCT) in Chamoli district are of Mesoproterozoic Period and are exposed at different structural levels and individually occupy very small areas. Regionally metamorphosed rocks, along with granitoids occur as Klippen, over the sedimentary sequence, towards south of Main Central Thrust (MCT) in the district. The Central or Higher Himalayas in Rudraprayag district consists of metamorphosed rock sequences of Palaeoproterozoic age and are of green schist to amphibolite facies.

64. The rock sequences of Higher Himalaya and most of the Lesser Himalaya are mainly of :

Proterozoic age. Lithologically these sequences are regionally metamorphosed rocks emplaced by granitoids of various ages and weakly metamorphosed to unmetamorphosed sedimentaries comprising of quartzites with interbedded volcanics, carbonate rocks associated with slate, quartzite and shale. The ages of regionally metamorphosed sequence is not well known and has been inferred by the ages of intrusive granitoids.

65. **Rocks of Palaeoproterozoic** (2500-1600 Ma) Period: The metamorphic rocksassociated w..h granites, gneisses and migmatites have been referred as Central Crystallines in the Himalay.. Region. Generally, these Crystallines occurs as thrust sheets over metasedimentaries of Less.. Himalaya in varied tectonic setting. South of Main Central Thrust (MCT), the crystalline rocks occur in two settings

1) Bounded by the Main Central Thrust (MCT) on the north and thrust over the sedimentaries of Garhwal Group and

2) As a Klippe occurring over the rocks of Garhwal Group.

66. The Period is characterized by extensive development of quartzite with penecontemperanec.. volcanic flows and carbonates. The section is well exposed in the inner part of the Less.. Himalayas the belt bounded by North Almora Thrust in the south and Main Central Thrust in the north.

Granitoids of Mesoproterozoic Period: The granitoids of Chamoli and Uttarkashi district occur at different tectonic levels. Granitoids emplaced in the regionally metamorphosed rocks commonly known as Crystallines of Proterozoic age occur as Klippe in the Lesser Himalay.. Zone locally known as Volcanics of Garhwal Group. Granitoids also occur associated w.. volcanic sedimentary sequences, emplaced in the rocks of Garhwal Group such as Chandrap.. Granite of age 1595 Ma (Pandey, 1981).

Central Crystallines: The Central Crystallines from the basement of Martoli Group and Tethyan Sediments. Central Crystallines probably represent the oldest rocks exposed in Higher Himalaya and thrust over the rocks of Lesser Himalaya along the Main Central Thrust (MCT). These are the metamorphic rocks associated with granites, gneisses and migmatites.

67. ***Bhilangana Formation:*** The Bhilangana Formation is bounded by Main Central Thrust on .. north and consists of quartzite schists and granite gneisses. It is thrust over the rocks of Garhw.. Group. This formation also includes quartzite, schist, carbonaceous phyllites, limestones and some metapeltic rocks.

68. ***Agastmuni Formation:*** It is the name given to schist, schistose quartzites and thin bands of dolomite exposed in the Mandakini valley. The metamorphosed sequence of orthoquartzite, slates with penecontemperaneous flows has been emplaced by the Chandrapuri gneisses. Many workers consider the Agastmuni Formation as the base of Garhwal Group.

69. ***Rautgara Formation:*** The Rautgara Formation is well exposed along the Srinagar-Rudrapray.. section in the Alaknanda valley. Its the name given to a sequence of massive cream coloured, purplish and brownish fine grained quartzite interbedded with purple green mottled slate and calcareous phyllites exposed in Saryu valley of Pithoragarh district by Valdiya (1962). The Rautgara Formation is best developed and mapped by Gopendra Kumar and Agarwal (1975) in

the Alaknanda valley. ***Granitoids of Chandrapuri:*** These intrusive granitoids of plutonic origin are best exposed in Chandrapuri area of Rudraprayag district. The granitoid is mainly of tourmaline biotite granite and is made up of hypidiomorphic granular aggregate of feldspars (microcline and plagioclase) and quartz with subordinate greenish biotite. ***Volcanics of Garhwal Group:*** The granitic intrusive in the Grahwal Group is of Biotite granite type and intrudes the Rautgara Formation towards west of Tilwara. The volcanic are composed of very coarse grained, non-foliated, rich in biotite and generally porphyrytic. They are also exposed in Pokhri area of Rudraprayag district.

iii. Physiography

70. Uttarakhand lies in the Northern part of India amidst the magnificent Himalayas and dense forests. The state is bordering Himachal Pradesh in the north-west and Uttar Pradesh in the South and has international borders with Nepal and China. The State today with 13 Districts can be grouped into three distinct geographical regions, the High mountain region, the Mid-mountain region and the Terai region. Uttarakhand consists of 13 districts viz., Pithoragarh, Almora, Nainital, Bageshwar, Champawat, Uttarkashi, Udham Singh Nagar, Chamoli, Dehradun, Pauri, Tehri Garhwal, Rudraprayag and Haridwar. The project roads fall in Western Himalayas Physiographic Zones. Physiographically the Chamoli and Uttarkashi district, which lies in a region of tectonic or folded and overthrust mountain chains, has strata are structurally marked by complex folds, reverse faults, overthrusts and nappes of great dimensions, all these as well as frequent earthquake of varying intensity give region to believe that the region is still unstable.

B. Pedology

71. Dynamic, heterogeneous, non-renewable resource, which support plant and animal life. The tract of Chamoli and Rudraprayag district consists of outward succession of ridges viz; Greater Himalaya and Lesser Himalaya of decreasing height. These hills posses very little level land. The soils have developed from rocks like granite, schist, gneiss, phyllites, shales, slate etc. under cool and moist climate. Very steep to steep hills and Glacio-fluvial valleys are dominantly occupied with very shallow to moderately shallow excessively drained, sandy-skeletal to loamy-skeletal, neutral to slightly acidic with low available water capacity soils. They have been classified as Lithic/Typic Cryorthents. These soils are in general under sparse vegetation. Soil types of Chamoli and Uttarkashi district as follows:

S.No	Soil Type	Characteristics
1	Brown forest soil and residual sandy loam	Acidic, rocky, stone and gravel and poor moisture regime

0The baseline data on soil quality will be generated by the contractor before commencement o. construction works.

The proposed locations of soil quality monitoring at pre construction stage (baseline data) are a' follows as per

S.No	Name of Subproject	No of Samples	Sampling Location
1	Renovation/ Upgradation of TRH Kaleshwar	01	TRH Kaleshwar
2	Renovation/ Upgradation of TRH Gopeshwar	01	Gopeshwar
3	Renovation/ Upgradation of TRH Adibadri	01	TRH Adibadri
4	Renovation/ Upgradation of Travellers's lodge Badrinath	01	TRH Badrinath
5	Renovation/ Upgradation of Yatri Niwas, Badrinath	01	Yatri Niwas, Badrinath
6	Renovation/ Upgradation of TRH Syanchatti	01	TRH Syanachatti
7	Renovation/ Upgradation of TRH Purola	01	TRH Purola
8	Renovation/ Upgradation of TRH Hanuman Chatti	01	TRH TRH Hanuman Chatti
9	Renovation/ Upgradation of TRH Barkot	01	TRH Barkot
10	Renovation/ Upgradation of TRH Barkot (Annexy)	01	TRH Barkot (Annexy)
11	Renovation/ Upgradation of TRH Maneri	01	TRH Maneri

During construct ion the sampling locations proposed are, where the construction/ restorat. .l/ repair work will be done.

C. **Climate and Meterology**

72. With its highly varying topographical features, has shown an equally variegating c. .iati condition, ranging from hot and sub-humid tropical in the southern tract of Bhab' 'r t temperate, cold alpine, and glacial climates in the northern part of the high mountains.

Factors such as elevation, slope, proximity of glaciers, forests, mountain peaks and ridg's an direction of mountain ranges together give rise to the great variations in climatic conditions even at the micro and local levels. These attributes determine the temperature range as well a the distribution of rainfall. However, the overall climatic condition in the State is governed b the southwest monsoon. It has a sub-tropical to temperate climate, with three pron .nce seasons; summer, winter, and monsoon. The hilly terrain of the Himalayan region ha: mo cover and is severely cold during winter with snowfall normally occurring during the mo' hs c December to March. The climatic conditions of Almora, Nainital, Pithoragarh, Ch mol Uttarkashi, Pauri and Dehradun are humid and cold.

73. The climate of Chamoli and Uttarkshi district according to Central Ground water board varies from Sub-tropical monsoon type (mild inter, hot summer) to tropical upland type (mild winter, dry winter, short warm summer). The northern, northwestern, northeastern and western part of the district is perennially under snow cover: here the climate is sub-arctic type as the area is represented by lofty Himalayan Range. Severe winter and comparatively higher rainfall are the characteristic features of the northern part. The year may be divided into four seasons viz. the cold winter season, (December to February), the hot weather season (March to May), southwest monsoon season (June to September) followed by post monsoon season (October to November). Larger part of the district is situated on the southern slopes of the outer Himalayas, monsoon currents can penetrate through trenched valleys, the rainfall reaches its maximal in the monsoon season that spans betweens June to September. Rainfall, spatially, is highly variable depending upon the altitude. In the Lesser Himalayan Zone (1000-3000m amsl) maximum rainfall occurs about 70 to 80% in southern half. August is the rainiest month. Rainfall rapidly decreases after September and it is the least in November. About 55 to 65% rainfall occurs in the northern half in Central Himalayan Zone. About 17% of the annual precipitation occurs in winter season. The winter precipitation is in association with the passage of the western disturbances and is mostly in the form of snowfall, particularly at higher elevations. The precipitation during the premonsoon month, which is about 7% of the annual total and the post-monsoon months, is frequently associated with thunderstorms.

D. Ambient Air Quality and Noise Level

74. The pristine environment and sparse population suggest that most part of the State have a very good air quality. Any point or non-point pollution sources of air pollution were not observed throughout the survey period. It was observed that the traffic on the roads is too low to cause unbearable air pollution due to vehicular exhaust. Finally, there are no industries recorded in or along the subproject area and hence any other source of atmospheric air pollution is not expected.

The air pollution level is well within the permissible limits because there are no major sources of pollution in the region. The baseline data on ambient air quality Monitoring will be generated by the contractor before commencement of construction works. The proposed locations of air quality monitoring at pre construction stage (Baseline data) are as follows as per CPCB guideline monitoring location as follows.

S.No	Name of Subproject	No of Samples	Sampling Location
1	Renovation/Upgradation of TRH Kaleshwar	01	TRH Kaleshwar
2	Renovation/Upgradation of TRH Gopeshwar	01	Gopeshwar
3	Renovation/Upgradation of TRH Adibadri	01	TRH adibadri
4	Renovation/Upgradation of Travellers's lodge Badrinath	01	TRH Badrinath
5	Renovation/Upgradation of Yatri Niwas, Badrinath	01	Yatri Niwas, Badrinath
6	Renovation/Upgradation of TRH Syanchatti	01	TRH Syanchatti
7	Renovation/Upgradation of TRH Purola	01	TRH Purola
8	Renovation/Upgradation of TRH Hanuman Chatti	01	TRH Hanuman Chatti
9	Renovation/Upgradation of TRH Barkot	01	TRH Barkot
10	Renovation/Upgradation of TRH Barkot (Annexy)	01	TRH Barkot (Annexy)
11	Renovation/Upgradation of TRH Maneri	01	TRH Maneri

During renovation the sampling will be conducted where the renovation/up gradation work will be done.

Ambient Noise Level

75. Generally, noise pollution is not a problem in the state except in the urban areas like Dehradun Traffic, industrial, and festival/cultural noises, along with noise generated from constructic activities, DG sets etc., are the most prominent sources of noise in the urban areas. Overall noise level in the town is calm except on the busy roads of Chamoli and Uttarkashi.

During the construction period, a temporary increase in the noise levels are expected as there will be movement of construction machineries and construction activities to be done in the proposed rehabilitation of water supply system. Suitable noise barriers in the form of vegetation and timely scheduling of construction activities will help minimize these effects better. It was observed that ambient noise scenario in residential, commercial, and sensitive areas in the study area are quite low in general. The baseline data on ambient noise levels will be generated by collection of representative samples by the contractor before commencement of construction works. The selection of sampling location will be representative of residential, commercial, institutional, industrial and sensitive locations.

76. The proposed locations of noise monitoring at pre construction stage (Baseline data) are as follows as per CPCB guideline monitoring location as follows:

S.No	Name of Subproject	No of Samples	Sampling Location
1	Renovation/Upgradation of TRH Kaleshwar	01	TRH Kaleshwar
2	Renovation/Upgradation of TRH Gopeshwar	01	Gopeshwar
3	Renovation/Upgradation of TRH Adibadri	01	TRH adibadri
4	Renovation/Upgradation of Travellers's lodge Badrinath	01	TRH Badrinath
5	Renovation/Upgradation of Yatri Niwas, Badrinath	01	Yatri Niwas, Badrinath
6	Renovation/Upgradation of TRH Syanchatti	01	TRH Syanchatti
7	Renovation/Upgradation of TRH Purola	01	TRH Purola
8	Renovation/Upgradation of TRH Hanuman Chatti	01	TRH TRH Hanuman Chatti
9	Renovation/Upgradation of TRH Barkot	01	TRH Barkot
10	Renovation/Upgradation of TRH Barkot (Annexy)	01	TRH Barkot (Annexy)
11	Renovation/Upgradation of TRH Maneri	01	TRH Maneri

E. Hydrology

77. Uttarakhand has tremendous water resources such as glaciers, lakes, rivers and other water bodies. Most of these have tourism importance like Milam, Pindari, Sunder Dhunga and Heeramani Glaciers; Seven Lakes in Nainital; and some wetlands. However these water bodies are located far from the Project area. Generally, there has been an overall decline in water resources in the State. Hydrological studies over the last decades confirm the diminishing water resources and the worsening crises (Rawat et. al) as caused by the following factors which have resulted in the decrease in underground seepages. These have directly contributed to the reduction of water availability in and reduction of discharge in nallas as well as extensive disappearance of spring' the regions primary source of drinking water.

There has been a diminishing regulatory effect of glaciers of the Great Himalayan zone.

- There is a long-term decreasing trend of stream discharges.
- The capacities of the lakes have dwindled.
- Surface runoff on the hillsides has shown high increase.
- There has been an increase in floodwater and decrease in base flow water in channels and rivers.
- Extensive soil erosion and landslips are recurring phenomena in the region.

i. **Water Drainage**

78. The region of Uttarakhand is well drained by numerous rivers and rivulets locally known a Gad, Gadhera and Naula. The water resources of this region are of singular importance not only for the region but also for the whole Gangetic plains of north India. There are three main river systems are: (i) the Bhagirathi Alaknanda basin Ganges basin, (ii) The Yamuna Tons basin, and (iii) the Kali basin. The Ganges system drains the major part of the region covering the whole of the Garhwal, except the western part of Uttarkashi district, and the western part of Garhwal Himalayas from an altitude of 7,138 m meet at Devprayag and flow as the Ganges thereafter. The Bhagirathi is the main stream while the Alaknanda, Saraswati, Dauli

79. Ganga, Berahi Ganga, Nandakini, Mandakini, Madhu Ganga, Pindar, Atagad, Bhilangana, Jad Ganga, the Kaldi Gad and the Haipur are the main tributaries to the Alaknanda and/or Bhagirathi, ultimately contributing to the waters of Ganges. The Nayar, which drains more than a half area of the Garhwal district, is an important tributary of the Ganga. The Yamuna-Tons system is also located in the Garhwal region. The Yamuna river rises at Yamunotri and is joined by important tributaries such as the Giri and more importantly, the Tons, which is its biggest tributary with 2.7 times greater volume of water than the Yamuna. The River Yamuna flows out of the hill areas through the Doon valley and the Shivaliks, into Haridwar district, being joined in the Doon valley by several streams.

ii. **Water Quality**

80. There is very little documentation on the pollution status of the river in the upper reaches of Himalayas and other small water bodies. In terms of quality, the surface water of the State is unprotected from untreated wastewater, and runoffs from chemical fertilizers and pesticides. No proper sewage treatment facilities exist in the project area. The increasing pollution of water bodies constitutes the biggest threat to public health. At present, there is limited information available on the quality of fresh water resources in the State.

Based on limited records, the water quality of Uttarakhand's rivers, rivulets, and other natural water sources is generally good and no major source of water pollution was found. The hand pumps, natural water seeping out from mountains locally called as Naula, and natural water springs locally called as, Gadher, represent the ground water sources in the hills. There are no major sources of water pollution in terms of point or non- point sources aside from natural landslides leading to deposition of debris instreams. The baseline data on water quality will be generated by collection of representative samples by the contractor before the commencement of construction activity.

The proposed locations of water quality monitoring in pre construction stage are as follows as per CPCB guideline monitoring location as follows:

S.No	Name of Subproject	No of Samples	Sampling Location
1	Renovation/Upgradation of TRH Kaleshwar	01	TRH Kaleshwar
2	Renovation/Upgradation of TRH Gopeshwar	01	Gopeshwar
3	Renovation/Upgradation of TRH Adibadri	01	TRH adibadri
4	Renovation/Upgradation of Travellers's lodge Badrinath	01	TRH Badrinath
5	Renovation/Upgradation of Yatri Niwas, Badrinath	01	Yatri Niwas, Badrinath
6	Renovation/Upgradation of TRH Syanchatti	01	TRH Syanchatti
7	Renovation/Upgradation of TRH Purola	01	TRH Purola
8	Renovation/Upgradation of TRH Hanuman Chatti	01	TRH TRH Hanuman Chatti
9	Renovation/Upgradation of TRH Barkot	01	TRH Barkot
10	Renovation/Upgradation of TRH Barkot (Annexy)	01	TRH Barkot (Annexy)
11	Renovation/Upgradation of TRH Maneri	01	TRH Maneri

During construction the sampling will be conducted where the construction/ restoration/ repair work will be done.

F. MINERAL RESOURCES

81. Uttarakhand state is not rich in mineral resources. Moreover, it is also part ecologically sensitive area, extensive quarrying is not practiced in the state. However, there are some mineral sparsely distributed in the state. It includes limestone, Gypsum, Iron Ore, Graphite and Copper. It has been estimated that there are deposits of 100 million tonnes of limestone, 35 million tonnes of dolomite, 21 million tonnes of magnesite, 9.0 million tonnes of rock phosphate, 4.0 million tonnes of gypsum, and 8.8 million tonnes of soap stone in different areas of the State. Some of the major mineral deposits are indicated in the succeeding Table.

Table: IV-2: Availability of Important Minerals (million tonnes)

Sl. No.	Mineral	Quantity
1	Limestone	430.5
2	Marble	6.4
3	Rock Phosphate	25.0
4	Barytes	0.085
5	Graphite	10.7

6	Dolomite(superior)	30
7	Magnesite	70.294
8	Copper	1.6
9	Soap stone	26.64
10	Gypsum	0.195

Source: http://rrtd.nic.in/Uttrakhand.htm)

The minerals that are found in the district are the following-

Asbestos-This is of the amosite variety and can be used for the production of asbestos, cement bricks, laboratory asbestos sheet and paper, but is not considered to be of economic importance

Magnestie - This is of an average quality is crystalline in nature, and is found associated with crystalline dolomites and sometimes with soapstone. The Magnesium carbonate found here is also of average quality and its mineralisation has also been reported to occur in the district.

Soapstone or Steatite - This white saponaceous stone resembling pipe clay is obtained in a lenticular body and is associated with mineral pyrites, which adds a color to it, and in plac with magnesite. it can be mined for use as filler in soap and in the cosmetic industries. In the past various utensils were made of it which, when polished, had the appearance of marble.

Copper - The copper mines in the district are extensive and of reputed during the period of Hindus and The Gorkhas rules. All the rich mines have since being exhausted and at present they do not offer a fair field for the employment of capital.

Iron - Small and sporadic occurrence of iron are known to occur in several parts of district bu are of hardly any economic important. Iron ore, rich in haematite, and magnetic ore, wi haematite and siderite, also occur in the district.

Graphite - In the past this mineral, also known as plumbago, found mostly in patti Lohba, was used as a dye but no large deposits have been noticed for a long time. **Gypsum** - This mineral is found on the bank of some river and was used in the past for the manufacture of saucers and bowls .when ground to a fine powder it is known as Plaster of Paris and can be used for a number of purposes.

Lead - Deposits of this metal were fairly numerous in the past but it is found in somewhat inaccessible places and has long since ceased to be worked.

Slate - This dense, fine grained metamorphic rock, which is produced from a fine clay, can be split into thin, smooth plates and is quarried throughout the district. It is suitable for roofing purposes, the thin dark blue slates being somewhat inferior in quality.

Building Stone - Stone which can be used for building purposes is available in most parts of the district. Sand stone is found in abundance in the lower hills. Gneiss and chlorite schists which are available throughout the district are frequently used for building purposes.

Sulphur - This yellow mineral, also known as brimstone is found in the district as green sulphate of iron and is obtainable from iron pyrites and copper mines, its presence being characterised by a small as of rotten eggs. Sulphur springs also occur in many parts in the district.

Bitumen - The brownish white natural sulphate of alumina known as Shilajit is found in rocks at a fairly high altitude and occur in small lumps which generally have an admixture of red sand and micaceous stone embedded in them. It is used in Ayurvedic medicine and during the season when there is an influx of pilgrims, it fetches good income to those who deal in it.

Some other minerals found in the district are Antimony, Arsenic, Lignite or Brown Marble, Mica and silver.

G. Seismology

82. The main tectonic elements of the region include the (i) central thrust and (ii) boundary fault. Several NE-SW lineaments are also known from the area and these traverses different tectonic zones across.

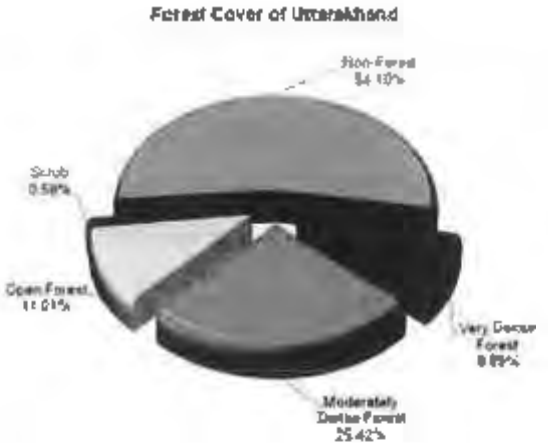
Figure IV-2 Seismic Zone of India

83. State constitutes one of the most active domains of the Himalayan region. Several recorded from this region. As such, the region is classified under high seismic zone IV and V. The modified metrically intensity broadly associated with the zone V is IX. The above Figure shows the seismic zones of India

H. Ecology

1. Forestry

84. According to The India State of Forest report 2015, the recorded forest area of the Uttarakhand state is 34,651 km^2 which constitutes 45.32% of its geographical area. Very-dense forest constitute 8.89%, moderately dense constitutes 25.42%, Open Forest constitutes 11.01% and scrub constitute 0.58% of total forest area.



85. The distribution of forest cover by district is presented in the succeeding Figure and Table. The Garhwal region has more forest cover with 14,498 km^2 compared to the Kumaon region with 9,742 km^2. However, they are almost equal in terms of distribution over its territory with 45% and 47% of covered with forest. The district of Pauri Garhwal, Uttarkashi, Nainital, and Chamoli have the largest forest cover accounting for 50% of all the state's total.

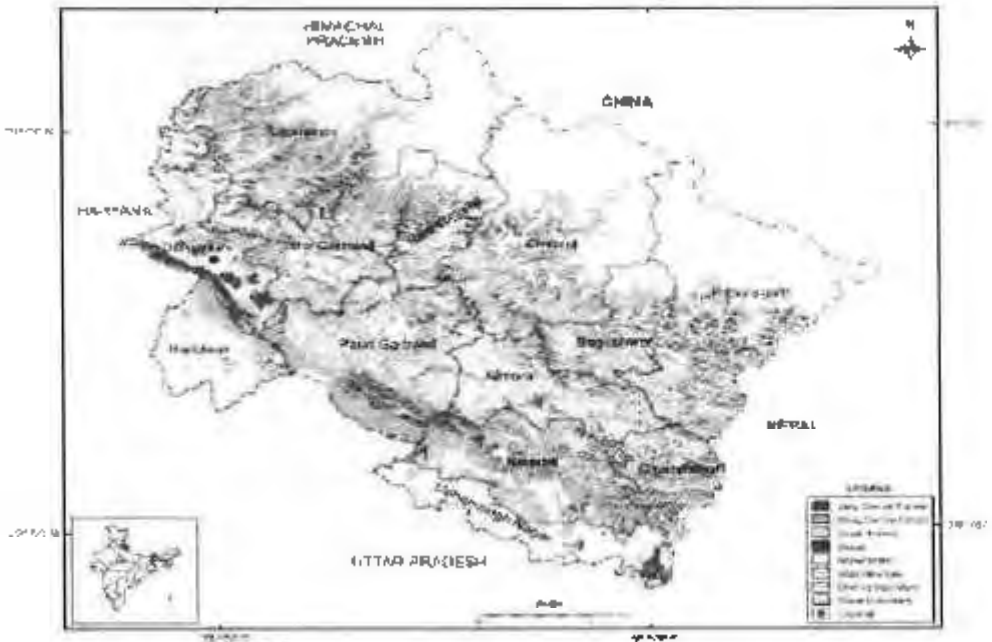


Figure IV-4 Uttarakhand's Forest Cover Map

Table IV-3 District-wise Forest Cover, Uttarakhand

Region	District	Geographic Area (GA)	Forest Cover			Total Forest	% of GA
			Very Dense	Moderate Dense	Open Forest		
Garhwal	Uttarkashi	8,016	570	1,778	724	3,072	38.32
	Rudraprayag	1,984	241	591	298	1,130	56.96
	Chamoli	8,030	441	1,561	679	2,681	33.39
	Pauri Garhwal	5,329	519	1,954	796	3,269	61.34
	Tehri Garhwal	3,642	296	1,239	621	2,156	59.20
	Dehradun	3,088	620	647	335	1,602	51.88
	Haridwar	2,360	25	301	260	588	24.92
Kumaon	Pithoragarh	7,090	509	1,013	580	2,102	29.65
	Bageshwar	2,246	200	834	329	1,363	60.69
	Almora	3,139	224	929	430	1,583	50.43
	Nainital	4,251	602	1,939	463	3,004	70.67
	Champawat	1,766	348	570	266	1,184	67.04
	Udham Singh Nagar	2,542	157	246	103	506	19.91
Total		53,483	4,754	13,602	5,884	24,240	45.32
Note	Very Dense Forest – All lands with tree cover of canopy density of 70% and above, Moderately Dense Forest Canopy density between 40%-70%, Open Forest – Canopy density between 10%-40%						

Source: State of Forest Report, 2015

86. Forest type mapping using satellite data has been undertaken by Forest Survey of India with reference to Champion and Seth (1968) classification. As per this assessment, the state has 34 forest types which belong to eigth forest type groups, *viz.* Tropical Moist Deciduous, Tropical Dry Deciduous, Subtropical Pine, Himalayan Moist Temperate Forests, Himalayan Dry Temperate Forests, Sub-Alpine Forests, Moist Alpine Scrub and Dry Alpine Scrub. Percentage wise distribution of forest in different forest type groups found in the state is given in the pie diagram.

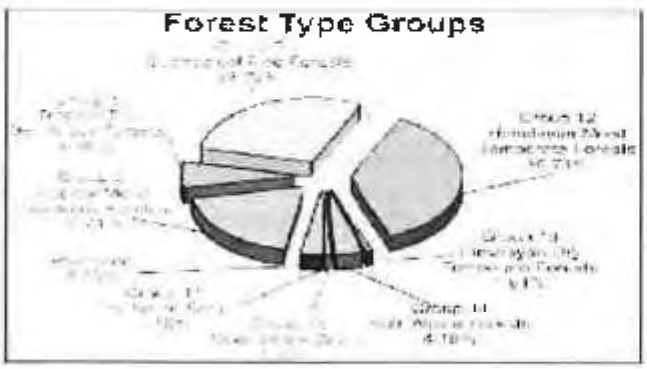


Figure IV-6. Forest type groups of Uttarakhand

87. A wide variety of tree species is found in the mountains of Uttarakhand and enumerated in the succeeding Table according to altitude location. Some notable tree species are Poplar (*Populus ciliata*) and Eucalyptus (*Eucalyptus citriodora*) due to their fast growing and large market demands, and Khair (*Acacia catechu*) and Seesam (*Dalbergia sissoo*) for their ecological and economic importance. Sal (*Shorea robusta*), which is highly adapted to sandy soil are being used to stabilize river banks and islands in river beds. Oak (*Quercus* sp.) is another important species considered to be amongst the best wood in the world specially for making agriculture implements due to its very heavy hard with twisted fibers. The State Govt. of Uttarakhand has declared the oak tree (*Quercus* sp.) as a *Kalpvriksha* or wish fulfilling divine tree often treated as the signature plant of the Kumaon Himalayas as numerous logos and insignias with a stylized version of the deodar inscribed on them. Deodar grows in the temperate to alpine climate that is found between 3500 and 12000 feet in this region. Finally Chir pine (*Pinus roxburghii*) a source of resin, which is used for producing resin and terpentine.

Table IV-4: Predominant top Canopy (Tree) Species According to Altitude

Sl. No.	Common name	English Name	Botanical Name	Altitude (m)
1	Kachnar	Orchid tree	*Bauhinia variegate*	600-900
2	Cheed	Chir Pine	*Pinus roxburghii*	600-900
3	Shal tree	Shal tree	*Shorea robusta*	600-750
4	Banj	Oak tree	*Quercus incana*	1700-2000
5	Kail	Blue pine	*Pinus wallichiana*	1800-2400
6	Buransh	Rose tree	*Rhododendron arboretum*	200-2100
7	Deodar	Cedar tree	*Cedrus deodara*	1800-2400
8	Raga	Himalayan fir-low level	*Abies pindrow*	2100-2900
10	Raga	Himalayan fir-high level	*Abies spectabilis*	2900-3600
11	Spruce	Spruce	*Picea smithiana*	2400-2900
12	Thuner	Himalayan Yew	*Texus baccata*	2400-2700
13	Surai	Cypress	*Cupressus torulosa*	2300-2400
14	Pangar	House Chestnut	*Aesculus indica*	1800-2100
15	-	Strawberry tree	*Cornus capitata*	2000-2300
16	Bhojpatra	Betula	*Betula utilis*	3000-3500
17	Buransh	Rose Wood	*Rhododendron arboreum*	1700-2000
18	Simaru	Rose Wood	*R. campanulatum*	2200-3000
19	Moru	Oak tree	*Quercus dilatata*	2000-2500
20	Kharsu/Khoru	Oak tree	*Quercus semicarpifolia*	2200-2400

2. Biodiversity

88. The State of Uttarakhand is endowed with rich bio-diversity as manifested by its approximately 64 percent forest cover. The State has established six national parks and six wildlife sanctuaries

for the conservation of flora and fauna. Such areas include the Nanda Devi National Park, Valley of Flowers, Gangotri National Park, Govind Pashu Vihar National Park, Rajaji National Park, Jim Corbett National Park, Kedarnath Wildlife Sanctuary, Askot Musk Deer Sanctuary, Mussoorie Sanctuary, Binsar Wildlife Sanctuary, Sanadi Sanctuary, and Govind Wildlife Sanctuary—all of which are being looked after by the Uttarakhand government. A positive remark on the State is that it maintains rich wildlife outside their protected areas.

Table IV-5: Wildlife in Uttarakhand

Sl. No.	Protected Areas	Year	Unit	Statistics
1.	**National Parks**			
	(i) Number	2011-12	No.	6
	(ii) Area	2011-12	Sq. Km.	4915
2.	**Wildlife Sanctuaries**			
	(i) Number	2011-12	No.	6
	(ii) Area	2011-12	Sq. Km.	2420
3.	**Important Wild Animals**			
	(i) Tiger	2008	No.	178
	(ii) Leopard	2008	No.	2335
	(iii)Elephant	2008	No.	1346
	(iv) Musk Deer	2008	No.	376
	(v) Black Bear	2008	No.	1935
	vi) Sloth Bear	2008	No.	172
	vii) Brown Bear	2008	No.	14

Source: Wildlife and Protected Areas, ENVIS, 2014

89. The Himalayas represent one of the most fascinating biota (fauna and flora) all over the world, both in terms of quality and quantity. This is evident from the fact that more than50 percent of all biota can be found only in the Himalayan region. Such fact is brought about by the region's uniqueness in terms of favorable climatic conditions, natural habitats, and soil types.

90. The State of Uttarakhand is represented by Biogeographic Zones 2B Western Himalaya and 7B Siwaliks in this region. About 18.7% of the total area under the Forest Department has been clearly earmarked for biodiversity conservation by the creation and management of 12 Protected Areas (PA) and a biosphere reserve in the State.

Table IV-6. National Parks in Uttarakhand

Sl. No.	National Park	Year of Establishment	Area (sq.km)	District
1.	Corbett NP	1936	521	Nainital and Pauri
2.	Nanda Devi NP	1982	630	Chamoli
3.	Valley of Flower NP	1982	87	Chamoli
4.	Rajaji NP	1983	820	Dehradun and Haridwar
5.	Gangotri NP	1989	2390	Uttarkashi
6.	Govind NP	1990	472	Uttarkashi

Source: Wildlife and Protected Areas, ENVIS, 2002

Negi, A.S., Status, Distribution and Management of Mountain Ungulates in Uttaranchal, Envis Bulletine, 2002

Table IV-7 Wildlife Sanctuaries in Uttarakhand

Sl.No.	Sanctuary	Year of Establishment	Area (sq.km.)	District
1.	Govind WLS	1955	521	Uttarkashi
2.	Kedarnath WLS	1972	957	Chamoli
3.	Askot WLS	1986	600	Pithoragarh
4.	Sonanadi WLS	1987	301	Garhwal
5.	Binsar WLS	1988	46	Almora
6.	Musoorie WLS	1993	11	Dehradun

Source: Wildlife and Protected Areas, ENVIS, 2002

91. Variations in the topography of high mountain ranges and deep valleys and altitudes from sea-level portions give the project districts different habitats for a variety of fauna and in turn resulted in the enriched biodiversity in the region. The common wildlife reported from the forests includes Tigers, Panthers, Civet Cats, Leopard Cats, Jungle Cats, Himalayan Silver Fox, and the Jackal. Various species of deer including the Musk Deer and the Barking Deer also roam in the districts. Sambhar and Gural as well as the Bear and the Porcupine are also found in the project area. The flying mammal Bat is also common in the area. Other animals in the region include the Chipmunk, the Rhesus Monkey and the Flying Squirrel. Discussion with local people during the survey process generated reports on the presence of Leopards, Deers, Foxes, and Wild Pigs. Some important information about wildlife of Uttarakhand is given in the Table below.

Table IV-8 List of Major Flora

Sr No	Local Name	Scientific Name
Trees		
1	Buransh	*Rhododendron arboretum*
2	Deodar	*Cedrus polycarpos*
3	Chir	*Pinus roxburghii*
4	Surai	*Cupressus tourulose*
5	Padam	*Prunus cornuta*
6	Mehal	*Pyrus pashia*
7	Otis	*Alnus nepalensis*
8	Ayar	*Lyonia ovalifolia*
9	Kafal	*Myrica sapida*
10	Akhrot	*Juglana regia*
11	Bhimal	*Grewia optiva*
12	Ritha	*Sapindus mukorossi*
13	Tun	*Toona ciliate*
14	Nimla	*Ficus auriculata*
15	Timur	*Zanthoxylum tamala*
16	Kharik	*Celtis eriocarpa*
17	Chamkhirik	*Carpinus viminea*
18	Katmon	*Betula alnoides*
19	Kajal	*Acer acuminatum*
20	Katoj	*Castanopsis tribuloides*
21	Kirmola	*Acer oblongum*
22	Kandru	Ilese dipyrene
23	Banj	*Quercus semicarpifolia*
Shrubs		

1	Kala Hisalu	*Rubus lasiocarpus*
2	Karoz	*Carissa spinarium*
3	Kobra Plant	*Arisama helleborifollium*
4	Kandali	*Urtica parviflora*
5	Satavar	*Asparagus racemosus*
6	Dudhi	*Hollerrhena antidysentrier*
7	Bajradanti	*Potentilla fulgens*
8	Banfasa	*Viola surpans*
9	Bach	*Acorus calamus*
10	Nakol	*Urticor dioica*
11	Patyura	*Pteraacanthus angustifrons*
12	Dudhia	*Taraxacum officinale*
13	Vatula	*Flemingia fruticulose*
14	Belmur	*Flacourtia indica*
15	Nirghesi	*Delphinium denudatum*
16	Silfoda	*Bergenia gossypina*
17	Jula	*Gerbera grassypina*
18	Jatamasi	*Nardostachys grandiflora*
Grasses		
1	Dub	*Cynodon dactylon*
2	Kush	*Sucharum spontanour*
3	Gol ringal	*Chimonobambusa falcate*
4	Tachita	*Apluda mutier*
5	Dev ringal	*Thamnocalamus faclouri*
6	Jhugra ringal	*Arundinaria jaunsarensis*

Table IV-9 List of Major Fauna

Sl. No.	Wild Animals		Birds	
	Local Name	Scientific Name	Local Name	Scientific Name
1	Guldar	*Panthera Pardus*	Chir Fijent	Catreus wallichii
2	Kala Bhalu	*Selenarctos thibetanus*	Kalij Fijent	*Lophura Leucomelana*
3	Ghural	*Memorhaedus goral*	Koklaj Fijent	*Pucrassia macrolophus*
4	Kakar	*Muntiacus muntjak*	Kala Irgal	*Letinaetus makavensis*
5	Khirao	*Capricornis sumatraensis*	Karorla	*Urocissa erythsorhyncha*
6	Jangli Suar	*Sus-scrofa cristatus*	Ullu	*Strix aluco nivicola*
7	Chitrola	*Martes flarigula*	Baaj	*Flaco severans*
8	Langoor	*Presbyits entallus*	Kala Titar	*Francolinus francolinus*
9	Khargosh	*Lepus nigricollis*	Papiha	*Cuculus varius*
10	Sehi	*Hystrix indica*	Tota	*Psittacula humalayana*
11	Gidar	*Canis aureus indicus*	Chakor	*Alectoris graeca chuker*
12	Jangli Billi	*Felis chaus*	Hariyal	*Treron spenura*
13	Gilehri	*Eurambulus pennanti*	Pashchimi Tregopan	*Tragopan meloccephalus*
14	Bandar	*Macaques mulatta*	Bulbul	*Pyconotus cafer*
15			Maina	*Aeriocheres tristis*
16			Fakhta	*Streptobelia orientalis meena*
17			Gidh	*Gyps himalayensis*
18			Kauwa	*Carvus macrornynchos*
19			Saat Bahen	*Teyrdoides striatus*
20			Neelkanth	*Garrulus Lanaclatus*

Biosphere Reserves

92. The Biosphere Reserve is the top category after Wildlife Sanctuary and National Park in the Country. Out of the 14 Biosphere Reserves situated in India, the Nanda Devi Bio-sphe Reserve (NDBR) established second among the 14 is situated in the State of Uttarakhand. extends in the three districts of Chamoli (Garhwal), Pithoragarh, and Bageshwar (Kumaon). Th Nanda Devi National Park (NDNP) and the Valley of Flowers are UNESCO World Heritag Site declared in 1988. The NDNP is located in the transition range between the Zanskar ange and Himalayan foothills with 97 species of plants including many rare and almost extinct plant like *Saussurea sudhanshui*, *Nardostachys grandiflora*, *Picrorhiza kurroa*, *Cypripedium e' gan C. himalaicum*, *Dioscorea deltoidea* and *Allium stracheyi*. There are also 83 animal species including the Bharal (*Pseudois nayaur*), Himalayan Musk Deer (*Moschus chrysogaster* Mainland Serow (*Capricornis sumatraensis*), Himalayan Tahr (*Hemitragus jemlahicus*), Gor (*Nemorhaedus goral*), Snow Leopard (*Panthera uncia*), Common Leopard (*Panthera pardus* Himalayan Black Bear (Selenarctos thibetanus), Common Langur (Presbytis entellus,, an Rhesus Macaque (*Macaca mullata*). Also, there are about 114 avian species and 27 spe es butterflies in the NDNP.

93. The Rajaji National Park was established in 1983 protecting sections of the tropical deciduou forest area of the Shivalik Hill range on the Himalayan foothills. The Park covers 820.42 squar kms, along the Haridwar, Dehradun and Pauri Garhwal. The park has a vast Sal forest, an mixed forest mostly covered with *Acacia catechu* and *Vetiveria zizanioides*. It is refuge t approximately 49 species of mammals, 315 species of birds, 49 species of reptiles, 10 species o amphibians and 49 of Piscean species. This park has the largest population of elepha ts i Uttarakhand and a large population of tigers and leopards. Noteable animals seen in the r ar the Wild Cat, Goral, Rhesus Macaque, Himalayan Yellow Throated Marten, Monitor, Lizar Indian Hare, Sloth, Himalayan Black Bear, King Cobra, Jackal, Barking Deer, Sambar. Wi boar, Indian Langur, Indian Porcupine and Pythons. The population of birds consists of th Great Pied Hornbill, Himalayan Pied Kingfisher, Sparrows, Fire Tailed Sunbird and the Peacoc (Indian National Bird).

The Jim Corbett National Park covers 520 sq kms of Savannah-type grasslands and Sal forest Declared as a Tiger Reserve in 1973, the Park has a rich diversity including the White Tige Throated Martem, Himalayan Palm Civet, Indian Grey Mongoose, Para, Kakka, Ghora' Ba headed Goose, Duck, Grepe, Snipe, Turtles, Python, Common Otter, Porcupine, Clack-tape Hare, Chital, Spotted Deer, Viper, Cobra, Krait, King Cobra, Tortoise, Graylag, Sandpiper, Gul Cormorants and Egrets. There are 488 species of flora found protected in the Park including Sa

Savannah Grass, Anogeissus- *Acacia catechu* forests, *Mallotus philippensis*, Jamun and *Diospyros tomentosa*.

94. The Govind National Park covers an area of 957 sq. kms in Uttarakashi and a sanctuary for the endangered Snow Leopard and some other 15 species of mammals and 150 species of birds that includes the Himalayan Black bear, Brown bear, Musk deer, Bharal, Himalayan Tahr, Serow and Common leopard. The endangered birds found in this region are Monal Pheasant, Koklas Pheasant, Bearded Vulture Himalayan Snow Cock, Golden Eagle, Western Tragopan, Steppe Eagle and Black Eagle. Other varieties of birds include Owls, Pigeons, Minivets, Thrush, Warblers, Bulbul, Cuckoo and Finches.

95. The Valley of Flowers is a World Heritage Site located in Chamoli. There are hundreds of species mostly being Orchids, Poppies, Primula, Calendulas, Iris, Lily, Roses, Violets, Rhododendron, Angelica, Himalayan Fritillary, Daisies and Anemones and also supports a variety of mammals like the Himalayan Tahr, Snow Leopard, Musk Deer, Red Fox, Common Langur (a type of monkey), Bharal, Serow, Himalayan Black Bear, Himalayan Brown Bear, Pica (Mouse hare). A huge variety of butterflies and birds are also found in the valley including Himalayan Golden Eagle, Griffon Vulture, Snow Partridge, Himalayan Snow Cock, Himalayan Monal, Snow Pigeon, and Sparrow Hawk.

4. Fishery

96. Fish abound in almost all streams of the district and riparian villages find in it an important supplement to their ordinary food. The common species found here are asela or saul, mahasher, kalabans or karaunch and fucta or phar kata. Other species found in the district include gadara, gadiyal or guluwa, tarra, symplu and nama, nawoo or japa. No interference with fishery activities is envisaged by execution of the proposed subprojects.

Socio-Economic

1. Social and Cultural Development

97. The State of Uttarakhand occupies a total land area of 53,483 sq. km. which is 1.73 percent of India's total land area. The native people of Uttarakhand are generally called either Garhwali or Kumaoni depending on their place of origin in either the Kumaon or Garhwal region. According to the 2011 census of India, Uttarakhand has a population of 10,116,752 comprising 5,154,178 males and 4,962,574 females, with 69.45% of the population living in rural areas. The state is the 20th most populous state of the country having 0.84% of the population on 1.69% of the land. The population density of the state is189 people per square kilometre having a 2001-2011 decadal growth rate of 19.17%. The gender ratio is 963 females per 1000 males. The crude birth

rate in the state is 18.6 with the total fertility rate being 2.3. The state has an infant mortality rate of 43, a maternal mortality rate of 188 and a crude death rate of 6.6.

98. The State is divided into Garhwal and Kumaon divisions. Administratively, the State is divided into 13 districts, 49 tehsils and 95 blocks. Garhwal division has seven hill districts with one located in the foothills (Haridwar). Kumaon division, on the other hand, has six districts one in the foothills (Udham Singh Nagar). There are 16,177 villages in the State and 7,227 gram panchayats. Of the total number of villages, 5,868 are not connected to all weather roads.

99. According to the 2011 census Chamoli district has a population of 391,114, roughly equal to the nation of Maldives. This gives it a ranking of 559th in India (out of a total of 640). The district has a population density of 49 inhabitants per square kilometre (130/sq mi) Its population growth rate over the decade 2001-2011 was 5.6%. Chamoli has a sex ratio of 1021 females for every 1000 males, and a literacy rate of 83.48%.

100. According to the 2011 census Uttarkashi district has a population of 329,686, roughly equal to the nation of Belize. This gives it a ranking of 567th in India (out of a total of 640). The district has a population density of 41 inhabitants per square kilometre (110/sq mi) Its population growth rate over the decade 2001-2011 was 11.75%. Uttarkashi has a sex ratio of 959 females for every 1000 males, and a literacy rate of 75.98%.

2. Land Use and Land Use Pattern

101. The land use pattern of Uttarakhand is strongly governed by the following: elevation, climate mountainous terrain, lithological type, topography, surface hydrology, sunlight in the fields of forestry and agriculture, alpine meadows, sparse vegetation (scrub), grazing land, barren land, and human settlement. The human settlements are mainly located in the shallow water zones or around the localities nearet to springs.

Forest is the main land use in the State and nearly 64 % of the geographical area is under the varying forest densities (cover). Tree line is clearly demarcated above 2900 m elevation. Agriculture is confined to areas of low reliefs which are underlined by weak rock formation (i.e schists, phyllites, weathered gneisses, and crushed quartzite). The cultivated land, approximately 11.5 % of the total geographical area, is either terraced/semi-terraced or plain. Other land use categories such as meadows, grazing lands, and scrubs do not exhibit definite relationship with lithology. It is also observed that the south-facing hill slopes are covered by lush green forests.

Table IV-10 Land Utilisation in Uttarakhand

Sl. No.	Land-use	Period / Year	Unit	Statistics
1.	Total Reported Area	2010-11	Hectare	5,672636
2.	Forest Area	2010-11	Hectare	3484803
3.	Culturable Waste Land	2010-11	Hectare	310390
4.	Fallow Land	2010-11	Hectare	127793
	(i) Current Fallow	2010-11	Hectare	43295
	(ii) Fallow Land other than Current Fallow	2010-11	Hectare	84498
5.	Barren & Uncultivable Land	2010-11	Hectare	224764
6.	Land under Non-agricultural Uses	2010-11	Hectare	217648
7.	Permanent Pasture & Other Grazing Land	2010-11	Hectare	198526
8.	Land under Misc., Tree Crops and Groves not included in Net Area Sown	2010-11	Hectare	385548
9.	Net Area Sown	2010-11	Hectare	723164

Source: Uttarakhand at a Glance 2012-13, Govt. of Directorate of Economics and Statistics

E. Health

102. The Infant Mortality Rate is 36 and Maternal Mortality Ratio is 359 (SRS 2007 - 2009) which are higher than the National average. The Sex Ratio in the State is 963 (as compared to 940 for the country). Comparative figures of major health and demographic indicators are as follows :

Table IV-11 Demographic, Socio-economic and Health profile of Uttarakhand State as compared to India figures

Indicator	Uttarakhand	India
Total Population (In Crore) (Census 2011)	1.01	121.01
Decadal Growth (%) (Census 2011)	19.17	17.64
Crude Birth Rate (SRS 2011)	18.9	21.8
Crude Death Rate (SRS 2011)	6.2	7.1
Natural Growth Rate (SRS 2011)	12.8	14.7
Infant Mortality Rate (SRS 2011)	36	44
Maternal Mortality Rate (SRS 2007-09)	359	212
Total Fertility Rate (SRS 2011)	NA	2.4
Sex Ratio (Census 2011)	963	940
Child Sex Ratio (Census 2011)	886	914
Schedule Caste population (In Crore) (Census 2001)	0.15	16.67
Schedule Tribe population (in crore) (Census 2001)	0.02	8.43
Total Literacy Rate (%) (Census 2011)	79.63	74.04
Male Literacy Rate (%) (Census 2011)	88.33	82.14
Female Literacy Rate (%) (Census 2011)	70.70	65.46

Source: RHS Bulletin, March 2007, M/O Health & F.W., GOI

103. The health infrastructure of the State is described in succeeding Table. There are only 14 Obstetricians / Gynecologists and 20 Pediatricians in the State. Such numbers are way below the estimated State requirement of 59 each. Some of the essential requirements of the new State include basic primary health care, pre and post-natal care, and nutritional status and preventive

care. Accessibility to health services with the aid of improved road conditions is essential to put progress in the health indicators of the State.

Table IV-12 Health Infrastructure of Uttarakhand

Indicators	Required	In position	Shortfall
Sub-centre	2341	1848	493
Primary Health Centre	351	257	94
Community Health Centre	87	59	28
Health worker (Female)/ANM at Sub Centres & PHCs	2105	2016	*
Health Worker (Male) at Sub Centres	1848	184	1664
Health Assistant (Female)/LHV at PHCs	257	88	169
Health Assistant (Male) at PHCs	257	29	228
Doctor at PHCs	257	205	52
Obstetricians & Gynecologists at CHCs	59	14	45
Pediatricians at CHCs	59	20	39
Total specialists at CHCs	236	51	185
Radiographers at CHCs	59	17	42
Pharmacist at PHCs & CHCs	316	292	24
Laboratory Technicians at PHCs & CHCs	316	81	235
Nursing Staff at PHCs & CHCs	670	243	427

(Source: RHS Bulletin, March 2012, M/O Health & F.W., GOI)

F. Cultural and Archeological resources

104. The State of Uttarakhand has a great range of cultural practices. Festivals and cultural activities are being celebrated throughout the year in the State. The major fairs and festivals of the Garhwal region include the Hatkalika Fair, Tapkeshwar Fair, Surkhanda Devi Mela, Kunjapuri Fair, Lakhawar Village Fair, and Mata Murti Ka Mela. On the other hand, major fairs and festivals in the Kumaon region consist of Uttarayani Mela, Shravan Mela (Jageshwar), Kartik Poornima at Dwarahat, Kasar Devi fair, and Nanda Devi melas.

105. Living in the mountains mostly in places that are not easily accessible the people of the district have been able to preserve their culture, folklore, folksongs and folkdances, the last, a distinctive feature of the district, being seasonal, traditional and religious, some of the better known being described below - The Thadiya dance, which is accompanied by song, is performed on Basant Panchami, the festival celebrating the advent of spring, the Mela, another dance, is perform on Deepawali and the Pandava during the winter after the harvesting of the crop and depicts the principal events of the Mahabharata. Other folk dances are Jeetu Bhagdawal and Jagar or Ghariyali. These dances enact mythological stories, the participants, both men and women, put

on their traditional colorful dress and dance to the tune of drums and Ransinghas. Another dance perform during the fairs and accompanied by song is the Chanchari in which both men and women participate. Folk songs are usually traditional and are sung particularly by the woman, who works very hard in the fields from morning till night in all kind of weather. During the month of Chaitra the women of the village gather at a central place and sing traditional song which generally relates deeds of heroism, love and the hard life which they have to lead in the hills. In the district, fairs, festivals, religious and social gatherings are the main occasions for recreation and amusement. On special occasions people arrange Swangs (open air dramatic performances) particularly depicting scenes or legends connected with Shiva and Parvati.

106. The houses in the district have not been build according to any town planning scheme but have been up haphazardly in clusters on level ground at places where water springs are accessible or on the bank of the river in the valley. The houses are build of stones and are generally double storeyed, a few having three to five storeys, the very low rooms on the ground floor, which are usually 1.8 mrts. high being used for housing the cattle. Each house has in front of it a courtyard called a Chauk. A mud or stone staircase or a wooden ladder leads to the upper storey, the roof being of wood. The height of the upper storey is generally 2.1 mtrs. and the roof is usually a sloping structures of timber covered with Patals (quartzite slabs), the well off use corrugated galvanized iron sheets. Generally the upper storey has a Verandah in front of the upper rooms.

107. The houses in the higher regions are two to three storeyes with balconies all round and paved courtyard in front where people do their threshing, weaving, spinning and other house hold works. A few houses have five or six storeyes, the topmost being used as the kitchen. At times the cattle sheds are made at some distance from the villages. The houses are built in rows of half a dozen or so and strikingly picturesque in their fort like appearance.

108. The staple grains consumed by the people of the district are wheat, rice, maze, mandua and jhanjora, the last three being coarse grains generally eaten by the poorer sections. The pulses consumed are urad, gahat, bhatt, soontha, tur, lopia and masor. The hindus of the district mostly vegetarian by habit and preference and although the Muslims, Christians and Sikhs are generally non vegetarian, those not able to afford eating meat daily due to want of fund or local unavailability often resulting to a vegetarian diet.

109. There is no Archaeological Survey of India (ASI) listed heritage sites within the study area.

G. Economic Development

1. Transportation and Communication

110. Transportation system is a key factor in the socio-economic development of any State. Roads are logically the critical inputs to the growth of all the sectors. Aside from road systems, the State of Uttarakhand is connected to other states via rail and air transportation systems.

Dehradun, Haridwar and Kathgodam are the major railway stations connected to various parts of the country. Jolly Grant near Dehradun is the lone airport present in the State. As per statistical data from 2013, Uttarakhand has a total road network of 28,198.92 km of which 2,773.82 km comprises the National Highway (1,150.82 km with State PWD and 1623.00 km with BRTF); 3,788.20 km comprises the State Highway; 3,289.74 km covers the MDR; 2,945.04 km comprises the ODR and 15,402.12 km of Village Road.

111. Density of road length per 100 sq. Km. is 45 km which is very low compared to the national average of 97 km. Only about seven percent of the roads in the State are built in two-lane standards while 50 percent are paved. About a third of the higher class paved roads are in poor condition and over 70 percent of the light-vehicle roads need to be repaired or rehabilitated. Due to the lack of road connectivity, vast areas of the State are inaccessible. Such problem influences the population to chunk in far flung areas of the State remaining to be under-developed and devoid of educational and health facilities and employment opportunities.

112. The road density per 100 sq. km. of the total area in Garhwal region is 30 km whereas road density in Kumaon region is 37 km. In terms of population, Garhwal region has 234 km of roads per lakh and the corresponding figure in Kumaon is 266 km. Motor vehicles has increased with the annual growth rate of 11 percent accounting to 44,7000 vehicles in 2003. PWD is the principal agency responsible for the management of roads in the State.

Table IV-13. Transportation of Uttarakhand state.

S.No.	Category of Roads	Year	Total Length (In k.)	
1	Border Roads Organization (BRO)	2013	1,623.00	
3	National Highway (NH)	2013	1,150.82	
3	State Highway (SH)	2013	3,788.20	
4	Major District Roads (MDR)	2013	3,289.74	
5	Other District Roads (ODR)	2013	2,945.04	
6	Village Roads (VR)	2013	11,158.36	
	Villages Roads (PMGSY)	2013	4,243.76	
	Total		28,198.92	
Postal and Communication Services				
1	Post Offices	2011-12	No.	2718
2	Telephone Exchanges	2011-12	No.	477
3	Telegraph Offices	2011-12	No.	2
4	PCOs	2011-12	No.	8429
5	Telephone Connections (Including WLL) by BSNL	2011-12	No.	278751
6	Mobile phone by BSNL	2011-12	No.	1360674

2. **Industrial Development**

113. The State has very few industrial units mainly because of lack resources. In the hilly terrains, industries promoted include food processing, fruit processing, medicinal/herbal plants, and horticultural/floriculture-based industries. In the plain districts of Haridwar, Udham Singh Nagar, and other places, capital intensive and high-value addition industries are being encouraged by the government.

114. In recent years, Uttarakhand has emerged as one of the most attractive industrial destinations in India. In this regard, the government is encouraging private participation in all industrial activities in the State. The New Industrial Policy announced in 2003 by the State government puts in place the regulatory framework for Uttarakhand's industrialisation. The New Industrial Policy indicates that private resources may be tapped while promoting integrated Industrial States in Uttarakhand. The State government provides assistance in establishing small and medium sized agro parks, food parks, and the likes which in turn are expected to provide common infrastructure facilities for storage, processing, grading, and marketing.

115. Main and traditional business of the state is, Handicrafts, Handlooms, Wool Based Industry, Khadi and Village Industries. Hydro Power, tourism are the backbone of economic development in the state. No recognizable industry is located along the project corridor.

3. **Agriculture, Forestry and Fishery**

116. Agriculture is the main economic activity in the State as per latest land-use statistics. The total reported area for agricultural activity is 55.66 lakh hectares. In the hills, the major crops grown include wheat, paddy, mandua, ramdana and potato whereas in the plains the major crops are wheat, paddy, pulses, and sugarcane.

117. The pattern of land ownership is unlike that found in the rest of India. Most of the Uttarakhand farmers are owner-cultivators. Tenant farming and sharecropping are rare while landholdings are generally small and limited to family farms' approximately 50 percent of all landholdings are less than 0.5 hectares in size and 50 percent under one hectare. As such, the zamindari system of big landholders is limited to the plains. Both the geography and the Pahari cultural heritage have played roles in maintaining a traditionally more equitable, if impoverished, land distribution in Uttarakhand.

118. Agriculture in Uttarakhand is very complex and is interlinked with crop husbandry, animal husbandry and forestry to form a production system. Agriculture is the main source of employment in Uttrakhand and around 58 per cent of workers earned their livelihood from this sector in 2011. Like all India scenario, proportion of workers was the highest in agriculture followed by other workers and household industry workers. Contribution of agriculture to the Net State Domestic Product (NSDP) during the year 2001-02 was about 30 percent and its share

showed a continuous decline having a percentage of 24.89 (2004-05), 17.80 (2009-10), 14.97 (2011-12), 14.71 (2012-2013) and 14.73 (2013-2014). Agriculture in the State is characterized by the following:

i. Out of 7.93 lakh hectare of agriculture land, hilly region covers 56.8 percent and plain region covers 43.2 percent.
ii. The cropping intensity in Uttarakhand is 163.79, which is much higher than country's average of 129.
iii. Both rain-fed and irrigated agriculture is practised in the State. Cereals are emphasised in the irrigated agriculture and two crops are taken in an agriculture year. In the rain-fed system millets, pulses and tuber crops are grown.
iv. Monocropping is a common practice in the irrigated areas whereas mixed cropping is common in rainfed areas.
v. 85 percent of the gross cultivated area is used only for growing food grains where value addition is low.
vi. More than 62 percent of the State Net Domestic Product comes from the three major towns of Dehradun, Nainital, and Haridwar.

119. In the mountain regions and the Himalayan agriculture specifically, farmers deviate substantially from the kinds practiced in less precipitous altitudes. Hill farmers have adapted to the difficult geography, and the terrain has likewise influenced cultural modes in mountain societies. Patterns of land ownership, subsistence versus surplus production, and level of market penetration have also been decisively affected. However, traditional Himalayan agricultural systems and knowledge-base are being steadily eroded by market pressures, bringing both economic and cultural changes in Uttarakhand. Age-old self-reliance has given way to dependency on imports from the productive plains that bear pesticide/chemical fertilizer-enhanced yields. Cultural domination from the plains also threatens Uttarakhand's traditional foods as an increasing taste for mill-polished rice is outcompeting mountain crops. Activists in the hills have responded with a Save the Seeds movement and are raising awareness about the need for agricultural biodiversity.

Figure IV.6. Agricultural Map of Uttarakhand State

120. Agriculture is also practiced in the river valleys of Uttarakhand a small 10-15 percent of the total land area. Over hundreds of years, many of the slopes have been cut into field terraces, a common characteristic of mountain agriculture throughout the world. The region's farmers have also developed advanced manure, crop rotation, and intercropping systems. Most of the land on hilly slopes is non-irrigated. Three types of agriculture can be found in most river valleys with each particularly suited to the type of land. These are as follows:

- Katil (Forest edge land)
- Hoe cultivation, with a standard rotation of 3 crops in 5 years
- Major crops are Finger millet/Mandua *(Eleusine coracana)*, Barnyard millet/Jhangora *(Echinochloa frumentesia)* and Chaulai/Ram Dana *(Amaranthus polygamous, Amaranthus blitum)*
- Upraon (Hillside land)
- Permanently terraced but unirrigated
- Major crops are Finger millet/Mandua *(Eleusine coracana)*, Barnyard millet/Jhangora *(Echinochloa frumentesia)* and Chaulai (*Amaranthus polygamous*) *etc.*
- Talaon (Valley bottom land)
- Paddy cultivation, low-lying, irrigated, double cropped
- Major crops area Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*), Sugarcane (*Saccharum officinarum*) *etc.*

Table IV-14. Area under Principal Crops and Productivity in Uttarakhand

Sl. No.	Items	Year/ Period	Unit	Statistics
Area Under Principal Crops (Provisional)				
1.	Cereals	2011-12	Hectare	896774
	(i) Rice	2011-12	Hectare	280108
	(ii) Wheat (*Triticum aestivum*)	2011-12	Hectare	369209
	(iii) Barley (*Hordeum vulgare*)	2011-12	Hectare	22508
	(iv) Maize (*Zea mays*)	2011-12	Hectare	28038
	(v) Finger millet (*Eleusine coracana*)	2011-12	Hectare	125163
	(vi) Sanwan	2011-12	Hectare	63002
	(vii)Other	2011-12	Hectare	8746
2.	Pulses	2011-12	Hectare	55690
	(i) Urad (*Phaseolus radiatus*)	2011-12	Hectare	12980
	(ii) Lentil (*Lens esculenta*)	2011-12	Hectare	12295
	(iii) Pea (*Pisum sativum*)	2011-12	Hectare	3451
	(iv) Gahat (*Mycrotoma biflorum*)	2011-12	Hectare	12033
	(v) Rajma (*Dolichos lablab*)	2011-12	Hectare	4614
	(vi) Gram			766
	(vii) Bhatt (Black Soyabeen)	2011-12	Hectare	5734

	(viii) Others	2011-12	Hectare	3817
3.	Oil Seeds	2011-12	Hectare	29705
	(i) Mustard (*Brassica compestris*)	2011-12	Hectare	14294
	(ii) Seasmum (*Sesamun indicum*)	2011-12	Hectare	2020
	(iii) Groundnut (*Arechis hypogea*)	2011-12	Hectare	1112
	(iv) Soyabean (*Glycin max*)	2011-12	Hectare	12279
4.	Other Crops	2011-12		
	(i) Sugarcane (*Saccharum officinarum*)	2011-12	Hectare	108255
	(ii) Onion (*Allium cepa*)	2011-12	Hectare	2353
Agriculture Productivity (Provisional)				
1.	Cereals	2011-12	Qtl./Hectare	22.03
	(i) Rice	2011-12	Qtl./Hectare	21.20
	(ii) Wheat (*Triticum aestivum*)	2011-12	Qtl./Hectare	23.80
	(iii) Barley (*Hordeum vulgare*)	2011-12	Qtl./Hectare	12.64
	(iv) Maize (*Zea mays*)	2011-12	Qtl./Hectare	14.66
	(v) Finger millet (*Eleusine coracana*)	2011-12	Qtl./Hectare	13.92
2.	Pulses	2011-12	Qtl./Hectare	8.15
	(i) Urad (*Phaseolus radiatus*)	2011-12	Qtl./Hectare	8.13
	(ii) Lentil (*Lens esculenta*)	2011-12	Qtl./Hectare	8.19
	(iii) Pea (*Pisum sativum*)	2011-12	Qtl./Hectare	9.54
	(iv) Gahat (*Mycrotoma biflorum*)	2011-12	Qtl./Hectare	8.04
	(v) Rajma (*Dolichos lablab*)	2011-12	Qtl./Hectare	10.27
	(vi) Gram		Qtl./Hectare	7.85
	(vii) Bhatt (Black Soyabeen)	2011-12	Qtl./Hectare	9.83
3.	Oil Seeds	2011-12	Qtl./Hectare	8.34
	(i) Mustard (*Brassica compestris*)	2011-12	Qtl./Hectare	8.00
	(ii) Seasmum (*Sesamun indicum*)	2011-12	Qtl./Hectare	2.26
	(iii) Groundnut (*Arechis hypogea*)	2011-12	Qtl./Hectare	12.72
	(iv) Soyabean (*Glycin max*)	2011-12	Qtl./Hectare	14.46
4.	Other Crops	2011-12	Qtl./Hectare	
	(i) Sugarcane (*Saccharum officinarum*)	2011-12	Qtl./Hectare	609.33
	(ii) Onion (*Allium cepa*)	2011-12	Qtl./Hectare	55.69

Table IV-15. Ecological Sub-Regions and Altitude-wise Major Agriculture Crops

Sl. No.	Ecological Sub-Region	Altitudinal Gradient(m)	Major Agriculture Crops
1.	Lower Dun, Terai	300 - 600	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*) and Sugarcane (*Sachharum officinarum*).
2.	UpperDun,Bhabar, lower Shivaliks	600 - 1,200	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*), Maize (*Zea mays*) Chaulai (*Amaranthus* species) Finger millet/ Mandua (*Eleusine coracana*) and Barnyard millet (*Echinochloa frumentesia*)

3.	Middle Garhwal-Kumaon	1,200 - 1,800	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*), Cheena (*Panicum miliaceum*), Potato (*Solanum tuberosum*), Barley (*Hordeum vulgare*), Finger millet (*Eleusine coracana*) and Barnyard millet (*Echinochloa frumentesia*),
4.	Upper Garhwal-Kumaon	1,800 - 2,400	Wheat (*Triticum aestivum*) Barley (*Hordeum vulgare*) Potato (*Solanum tuberosum*), Chaulai (*Amaranthus* species), Cheena (*Panicum miliaceum*) and Phaphra (*Fagopyum tataricum*)
5.	Cold Zone	2,400 - 3,600	Summer Crops: Wheat (*Triticum aestivum*), Barley (*Hordeum vulgare*) Potato (*Solanum tuberosum*), Phaphra (*Fagopyum tataricum*) Chaulai (*Amaranthus* species), Kauni (*Setaria etalica*) Ogal (*Fagopyrum esculentum*) and Uva Jau (*Hoycleum himalayanse*)

121. Various pulses (*e.g.*, "Masur" - *Ervum lens*; "Kulat" *Mycrotoma biflorus*) are grown intercropped during the two harvest seasons early winter after the rainy season (millet), and midsummer before the hot dry season (barley-wheat). Dry and wet rice, taro, pumpkins, beans, corn, ginger, chili, cucumbers, leafy vegetables, and tobacco are also grown in the area. Likewise, potatoes have become an important cash crop being grown in areas unsuitable for other plants (Berreman, 1963).

122. The irrigation facility is only available adjoining to rivers in valleys. The irrigation and drainage system in Uttarakhand is described below.

Table IV-16. Mode of Irrigation and Drainage System in Uttarakhand

Sl. No.	Items	Year/ Period	Unit	Statistics
Net and Gross Irrigated Area				
1.	Canals	2011-12	Hectare	83687
2.	Tube Wells	2011-12	Hectare	216100
3.	Other Wells	2011-12	Hectare	11519
4.	Tanks/ Ponds	2011-12	Hectare	83
5.	Other Sources	2011-12	Hectare	24747
6.	Net Irrigated Area (NIA)	2011-12	Hectare	336136

7.	Gross Irrigated Area (GIA)	2011-12	Hectare	561733
Irrigational Infrastructure				
1.	Length of Canals	2011-12	Km.	11588
2.	Length of Lift Canals	2011-12	Km.	242
3.	Tube Wells (State)	2011-12	No.	1110
4.	Pump Sets (Boring/ Free Boaring)	2011-12	No.	54642
5.	*Hauj*	2011-12	No.	32850
6.	*Gool*	2011-12	Km.	26365
7.	Hydrum	2011-12	No.	1547
8.	C.C.A. Under State Canal	2011-12	Lakh Hect.	3.302
9.	Revenue Collection by Irrigation	2011-12	Rs. Lakh	252.27

Fisheries

123. The State has great potential for the development of fisheries. The State abounds in perennial and seasonal water bodies which hold high promise for the growth of fishery. Golden Mahseer (*Tor putitora*), one of the main game and food fish in the central Himalayan region, has decreased significantly. The fish migrate considerable distances upstream in search of suitable spawning grounds. Stocks of the Himalayan mahseer are depleted and it is now considered an endangered species. Catch data from the major rivers are not available while studies are characterized as sporadic and preliminary in nature. According to available statistics, the Himalayan mahseer contributes significantly only in one river comprising 32.8% of the catch from the Nayar River, 9.7% from Song River, and 0.83.1% from other rivers. The important fishes commonly found in the Himalayan river basins are *Catla catla*, *Labeo rohita*, *Labeio calbase*, *Cirrihinus mirigale*, Clarius, batrachus, *Rita rita*, *Heteropneuptus fonilis*, *Notopterus nontopterus*, *N. Chitala*, *Macrobrachum rosenbergii*, *M. malconsoni*, *M. Chapral*, *Channa punctatus*, *C. gachua*, and *C. striatus*.

I. Energy and Electric Power Potential

124. Uttarakhand has an estimated hydro power potential of approximately 20,200 MW. However, only 1,130 MW has been tapped at present. Meanwhile, 4,170 MW projects are under implementation and 3,800 MW projects are allotted to Central, State and private sectors. Thirty-nine projects with a potential of 6,374 MW have been identified for PFR under PMs Hydro Initiatives.

125. Although Uttarakhand is a power surplus State, a lot needs to be done to harness the untapped potential and sale the surplus power to make this a GDP driver sector for the State.

J. Aesthetic and Tourism

126. Tourism is one of the strong pillars of the State economy. The State has high growth potential for tourism, be in nature, wildlife, adventure or pilgrimage tourism. The State received 10.5 million domestic tourists in the year 2000-01, 11.6 million in the year 2001-02. and 12.9 in the year 2002-03, 22.1 million in the year 2007 and 20 million in the year 2013. Expenditure on schemes for tourism development and promotion in the State has progressively increased over the years. In the current five year plan, about Rs. 860 million have been spent, which is about 10 times the amount spent during 1980-85. Some of the major destinations with tourism potential include Haridwar (called The Gateway of God), Rishikesh (the birth place of Yoga), Dehradun, Mussoorie, Almora, Kedarnath, Badrinath, Yamunotri, Gangotri, Jim Corbett National Park, Nainital, Ranikhet, and Pithoragarh.

127. Tourist travelling to Chamoli can visit shrine named Badrinath. Guarded on either side by the two mountains Nar and Narayan, the Neelkanth Peak provides a splendid backdrop to Badrinath, one of the 'Four Dhams'. One of the ,ost celebrated pilgrim spots in the country, it plays host to the famous Badrinath Temple. Legend has it that Lord Vishnu came to the area, called 'Badri Van', 33or the berry garden, to meditate after Narad rebuked the Lord for being immersed in worldly pleasures. The main deity is a meditating Lord Vishnu.

128. Yog Dhyan Badri, one of the five Badris is located at Pandukeshwar (1920 m), just 24 km short of Badrinath on Rishikesh-Badrinath highway.

129. The second largest district of Uttarakhand state, 8,030 square kilometers of area spread over 800 to 8000 meters above sea level, the snow clapped Himalayan peaks in Chamoli district are Nanda Devi, Nanda Ghunti, Trishul, Hathi parvat, Mrigthuni, Neelkanth. The fascinating glaciers like Doonagiri cuddling through and in between the Himalayan peaks and trekking ranges like Dronagiri and Kuari Pass offer heavenly pleasure to the nature lovers. Adding to the fun, Chamoli district houses Auli bugyal for adventure sports lovers who want to do skiing as a learner or professional. Different tributaries of holy Ganga like Alaknanda, Ramganga, Dhauli Ganga, Birhi Ganga, Nandakini, Khilrawan and Pindar rivers flow in Chamoli district contributing to its beauty and significance. Mountains and plains covered with variety of flora and fauna are other assets of Chamoli district. Valley of Flowers National Park is showcase of hundreds of varieties of wild flowers providing shades of colorful flowers- your heart will leap up with joy and you will look towards the sky to thank God that you are at the place at least once in your life. Nanda Devi Biosphere Reserve preserves wide variety of tree species and wild animals.

130. The himalayan forest consists of many types of trees depending upon altitude - Pine, Deodar, Spruce, Birch, Juniper etc. The higher altitude has alpine pastures. The rivers Bhagirathi and Yamuna originate from here. Uttarkashi (~ 1352 m) is situated near the Varuna Parvat between two rivers: Varunaand Asi, whose water flow into the Bhagirati river from either side of the town. The town is located on the bank of river Bhagirathi. Skanda Purana has called this place as Varunavata.

131. Gangotri: The temple of Devi Ganga is situated on the right bank of river Bhagirathi in the Gangotri village. There is a stone slab near the temple where king Bhagirath meditated to bring Ganga to earth. The stone slab is called Bhagirath Shila.

132. Yamunotri: River Yamuna originates near Yamunotri. The river actually flows from Kalind Parvat in the Bandar Poonch range.The temple of Devi Yamuna is situated here. One has to trek from Hanuman Chatti to Yamunotri, a distance of 13 km along the right bank of the river. (The route on the left bank goes to Kharsali)

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

133. The assessment for environmental impacts due to the implementation of this project has been carried out for potential impacts during the following stages of the project planning and implementation:

- **Location impacts.** Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities
- **Design impacts.** Impacts arising from project design, including the technology used, scale of operations, discharge standards, etc
- **Construction impacts.** Impacts resulting from construction activities including site clearance, earthworks, civil works, etc
- **O&M impacts.** Impacts associated with the operation and maintenance of the infrastructure built in the project.

134. The ADB Rapid Environmental Assessment Checklist for Tourism as per EARF is used during preparation of this IEE to screen the subproject for environmental impacts and categorization of the project (Appendix 2). Table V-1 provides the potential environmental impacts and the mitigation measures including the responsibilities for implementing the same. Subproject components are assessed to have similar impacts and hence are grouped together.

A. Land Acquisition and Resettlement

135. The proposed subproject locations are within the lands available with the government. There are no impacts envisaged on land acquisition or resettlement due to the proposed subproject components.

1. Land Ownership

136. The sub-project area is covering 2 Districts of Garhwal region in Uttarakhand namely-Chamoli and Uttarkashi. A total of 10 locations are proposed for renovation & up gradation of Tourism Assets in Disaster Affected Districts Chamoli and Uttarkashi under UEAP (Tourism). The District wise list of locations as per the land availability with ownership status was finalized after site visits by the environmental experts of PIU/PMU/ADB.

137. There is no case of private land acquisition. All the proposed sites are the property of Garhwal Mandal Vikas Nigam campus.

138. There is no resettlement issue envisaged in case of all 10 locations for the sub project. Since there is no encroachment noticed during site visit, also there is no livelihood loss of the community due to the construction of these structures, social due diligence is not needed to be prepared for these locations as per ADB safeguard Policy Statement 2009.

139. The location selected for renovation and up gradation was with an objective to restore tourism in the affected areas. The selection criteria are as follows:

- Land Availability- Department land
- Easy access
- Easy access to basic facilities like- water supply, electricity.

- Long term sustainability of the structure and proper maintenance.

2. Impact on existing or proposed land use

140. The proposed renovation/upgradation works of damaged tourist assets in Chamoli and Uttarkashi are inside the premise of the existing Tourist Rest Houses. In order to provide improved accommodation facilities to the tourist visiting shrines Char Dham in Garhwal region the renovation and upgradation works are been taken up. Land acquisition is not involved and there is no scope for change in land-use pattern. Hence the land use pattern in the locality will not change.

B. Environmental Impacts

i. Location Impacts

141. The locations considered for the subproject are within the areas designated for eco-tourism as part of developing Uttarakhand's conservation, heritage, natural and cultural attractions (...l o the sites are existing Tourist rest houses), and are outside areas demarcated for habitat prot tio and conservation. The subproject location does not fall within any sensitive ecosystem e cep for Badrinath subproject that falls under Nanda Devi Biosphere Reserve. The area of buffe zone is 5,148.6 sq km. It surrounds the core zone on all sides. Services and activities ar managed in a way that protects the core zone. There are 47 villages in the buffer zone. Th services and activities include restoration, sites for enhancing value addition to the resources limited recreation, tourism, grazing, etc., which are permitted to reduce its effect on core .one There would be no impact on flora & fauna of the area as no fragmentation of habitat is .cin in the zone and there is no dense forest in this zone. Hence no habitat issue occurring in the rea PIU tourism has sought permission from Divisional Forest Officer (DFO), Chamoli distric and Director, Nanda Devi Biosphere Reserve (NDBR) for the renovation/ upgradation works i Badrinath vide letter no. 150/PIU-Tourism (Garhwal) dated 25/6/16 and 156/PIU-GMVN Tourism (Garhwal) dated 29/6/16 respectively. The contractor will be mobilized only afte obtaining the requisite permission. Influx of labour population is likely to occur which may impart pressure on the local resources of the area. However, the nature of impacts wou d b intermittent & temporary. The vehicles transporting the material for the renovation work shal strictly confirm to CPCB standard. There is an existing Sewerage system at Badrina h fo disposal of sewerage. A Sewage Treatment Plant is also sanctioned under National Ganga Rive Basin Authority (NGRBA) program to cater the sewage of Badrinath Town.

Table V-1: Location Impacts for Tourism Assets in District Chamoli and Uttarkashi

S.No	District	Land Availability	Location Impacts
A	Chamoli and Uttarkashi	Govt. owned land	Implementation of the project will not have any bearing on ecology and environment of the locality. Since renovation and up gradation of the existing TRH building inside GMVN campuses is proposed, it will not involve any displacement of people or disruption of any economic activities. All the TRH to be renovated/ upgraded are outside the ecological sensitive area. The project will not involve influence the flora or fauna of the locality in any way. The subprojects will comply with environmental requirement specified in ADB'S Safeguard Policy statement 2009 and those specified in countries requirement regulation

142. The proposed renovation/upgradation works of damaged tourist assets in Chamoli and Uttarkashi are inside the premise of the existing Tourist Rest Houses, priority is to locate construction work camps, stockpile areas, storage areas, and disposal areas near the subproject area. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and resultant destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near the sensitive areas. All locations will be included in the design specifications and on plan drawings.

2. Design Impacts and Pre-Construction Impacts

143. Impacts arising from the inappropriate designs of proposed facilities would in general include the inadequate drainage provisions, contemporary designs for the traditional and cultural environment, etc. Selection of materials, if not carefully chosen, will adversely impact the aesthetic appeal of the surroundings. The results of interventions are unobtrusive and will be integral part of the overall ambience so as to avoid impacts on the aesthetics of the site.

144. All component designs will be worked out to minimize any impacts on the adjoining properties, and considering the drainage and sewerage connections on the road. Given that the there is a need for disposal of construction wastes, the contractors will be required to consult with the Field Project Implementation Unit- GMVN (PIU) and Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) for safe disposal sites.

3. Construction Impacts

145. The impacts are generic to the construction activities, in all subproject locations. All construction activities to be undertaken at the site will be approved by competent authority before start of any

such activity in the vicinity of the site so that the history and sanctity as well as the usability of the site are not hampered. Hence, the EMMP emphasizes on the construction impacts and necessary mitigation measures to be strictly followed by the contractor. Key impacts during construction are envisaged on the following aspects: (i) drainage, (ii) quarry/borrow pit operations, (iii) slope cutting and slope Stability (iv) water bodies and drainage courses dust generation, air and noise from construction activities, (vi) handling of construction materials at site, (vii) adoption of safety measures during construction: and community health and safety

4. Operation and Maintenance Impacts

146. As only renovation/up-gradation of existing 10 TRH which are already being operated and maintained by GMVN, proposed in Uttarkashi and Chamoli district so, after completion of renovation/upgradation work of TRHs, GMVN will continue to operate and maintain the 10 TRHs.

147. During the natural calamity/Emergency time the district administration will have the sole right for use of GMVN TRHs and GMVN will abide by the instructions of the SDMA and district administration regarding the use of TRH.

C. Benefits

Renovation and up-gradation of tourism assets in Disaster affected district Uttarkashi and Chamoli

148. Primary beneficiaries would be the communities of the affected district in the state and the tourist visiting Char Dham shrines that would benefits from the increased accommodation capacity of the region. And improved accommodation facilities for tourist/pilgrim. Despite increased accommodation facilities for tourist, it would generate direct and indirect employment for the locals.

D. Cumulative Impact Assessment

149. The cumulative impact assessment (CIA) examined the interaction between the subproject's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseeable future projects or activities. Site-specific mitigation measures will be implemented during construction to address temporary disruptions to land use, limitations on access to roads, sidewalk closures, parking modifications, and increased volumes of construction related traffic. During operations of the improved infrastructures and services, added residential developments, commercial and business facilities increased densities are expected to develop and enhance the subproject area. This can be considered a long-term cumulative benefit of the subproject.

150. Increased tourist influx is expected to impact the environment but at the same time the routes to these destinations are open for a limited time with limited number of tourists. As the locations

are mainly en route to pilgrim centres it is used by trekkers and adventure lovers, who have a different mindset towards outdoors and love for nature. This will be further addressed by the project through regular orientation programs designed both for the tourists and facility providers, and dissemination of awareness material highlighting the environmental importance of the area.

151. Implementation of the project will not have any bearing on ecology and environment of the locality. Since the all the assets are existing TRH buildings and it will not involve any displacement of people or disruption of any economic activity. The project will not influence the flora or fauna of the locality in any way.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Public participation during the preparation of the IEE

152. The public participation process included identifying interested and affected parties(stakeholders); informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; creating opportunities and mechanisms whereby they can participate and raise their viewpoints.

Table VI-1 List of Stakeholders Consulted

S.No	Date	Place	People Consulted	Designation/Occupation
1	14/05/2016	Kaleshwar	Girish Vashist	Manager, TRH
2			Pushkar Singh Rauthan	Room Boy, TRH
3			Vijay Purohit	Room boy, TRH
4			Pratap Singh	Farmer
5			Nand Lal Pallavi	Farmer
6			Mohan	Ward member
7			Rahul dev	Student
8			Sunil	Farmer
9			Sukhbir Singh Rawat	Shop Keeper
10			Vinod Rawat	Service
11			Vikram Lal	Gram Pradhan
12	14/05/2016	Gopeshwar	Chandan Kandari	Manager, TRH
13			Receptionist	TRH
14			Ramesh Purohit	Room Boy TRH
15			Dayal Singh	Cook
16			Manu Singh	Local Resident
17			Brij Mohan kothiyal	Waiter
18			Harsh Singh Negi	Waiter
19			Sispal Singh Negi	Local Resident,
20			Subodh Kumar	Shopkeeper
21	14/05/2016	Adibadri	Arvind Benjwal	Manager TRH
22			Shankar Singh Panwar	Room Boy, TRH
23			Naresh Barmola	Shopkeeper
24			Nayan Singh	Social worker
25			Sandeep Shah	Shopkeeper
26			Brijesh Nainwal	Advocate
27			Basan Shah	Reporter Amar Ujala,
28			Dham Singh Panwar	Pradhan
29	12/05/2016	Badrinath Yatriwas/ Badrinath Traveller Lodge	Pan Singh Bisht	Manager TRH
30			Bhagwat Singh Panwar	Guard
31			Kamal Kishore Dimri	Receptionist
32			Suresh Pokhriyal	Shopkeeper
33			Harish Bhatt	Room Boy
34			Gambhir Negi	Business
35			Pankaj Rawat	Business
36			Bhagat Singh	Shopkeeper

37	17/05/2016	Purola	Sundela	House wife
38			Kavita	Post Master
39			Sanjay	Business
40			Karishama	Teacher
41			Poonam Negi	Teacher
42			Anil Kumar	Service
43			Anuj Sing Farmer	
44	18/05/2016	HanumanChatti /Syanchatti	Brij Mohan	JE GMVN
45			Rahul Sharma	SDO Uttarkashi
46			Manoj	Farmer
47			Pankaj Semwal	Farmer
48			Rameshwar Shah	Fabricator Uttarkashi
49			Anil Kumar	Fabricator Uttarkashi
50			Mohd. Aakib	Farbricator
51			Manish Khanduri	Teacher
52			Vineet rajput	Teacher
53			Dinesh Rajput	Teacher
54	21/05/2016	Barkot/ Barkot Annexy	Brij Mohan	JE PIU GMVN Barkot
55			R. B Bhandari	Manager GMVN
56			Khajan Singh	Chokidar
57			Mahabir Singh	Room Boy, GMVN
58			Prem Singh	Farmer
59			Ashish Rawat	Business
60			Nikhil Joshi	Army
61			Mohan Pant	Police Man
62	22/12/2015	Maneri	Ritu Joshi	Doctor
63			Teena Thapliyal	Doctor
64			Ravi Nautiyal	Hotel Owner
65			Ramesh Singh	Business
66			Sunil Rawat	Student
67			Bhupendra Singh	Business
68			Manish Negi	Student
69			Mahindra Singh	Farmer
70			Shailendra Rayal	Service
71			Sanjay Thapliyal	Service
72			Ambika Semwal	Local Residence
73			Harshman Bhandari	Local Residence

153. Stakeholders feedback on process findings and recommendations; and ensuring compliance to process requirements with regards to Stakeholder consultation and participation with various stakeholders is an integral part of the environmental and social impact assessment and also part of regulatory requirement of EIA Notification, 2006 and ADB requirements. The stake holders of the project include project affected communities and institutional stake holders such as PCB, local bodies, Water Resource Department, Environmental Department, Mines and Geology Department, Forest Department, etc. Consultations at micro-level and macro-level (e.g. District/State level institutional consultations) helped planners to integrate the short term

and long terms requirements of the local, regional, state and national goals in to the planning process.

During Project preparation, consultations have been held with the EA, IA, Garhwal Mandal Vikas Nigam (GMVN), District Administration and other agencies on selection of subprojects and identification of key issues including addressing the current gaps in provision of basic services and improvement of tourist infrastructure.

Place: Kaleshwar
District: Chamoli
Date : 14/05/2016
Participant: GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Gopeshwar
District: Chamoli
Date: 14/05/2016
Participant: GMVN official and local people

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Adibadri **District: Chamoli** **Date: 14/05/2016** **Participant : GMVN official and Villagers**	
1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Badrinath
District: Chamoli
Date: 12/05/2016
Participant : GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Hanukanchatti/Syanchatti
District: Uttarkashi
Date: 18/05/2016
Participant : GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Purola
District: Uttarkashi
Date: 17/05/2016
Participant : GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Barkot/Barkot Annexy
District: Uttarkashi
Date: 18/05/2015
Participant : GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

Place: Maneri
District: Uttarkashi
Date: 22/05/2016
Participant : GMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to renovation and up-gradation • People's expectation for employing generation during renovation and up-gradation. • Any nuisance or health hazard due to construction activity • Any impact on any historical, cultural or religious monument. • Any loss of housing agriculture land and other property of displacement of people fully or partially. • Lack of accommodation tourist during pilgrim season.
2	**Stakeholder's Response:** • No any major impact on Environment, flora and Fauna due to construction activity but due care should be taken to preserve flora. • Villagers think for better livelihood and overall and development. • Villagers want employment for local villages people for construction • Construction activity is not causing any major health hazard. • More structure should be built to accommodate tourist during peak season time
3.	**Recommendation and Suggestion** • Local labor should be engaged during renovation and up-gradation.

B. Future Consultation and Information Disclosure

154. The public consultation and disclosure program will remain a continuous process throughout the subproject implementation and shall include the following

C. Consultation during Detailed Design

155. Focus-group discussions with affected persons and other stakeholders to hear their views and concerns, so that these can be addressed in subproject design wherever necessary. Regular updates on the environmental component of the subproject will be kept available at the PIU/PMU of UEAP.

156. PIU/PMU will conduct information dissemination sessions at major intersections and solicit the help of the local community leaders/prominent citizens to encourage the participation of the people to discuss various environmental issues.

157. The PIU/PMU, will conduct information dissemination sessions in the subproject area. During EMP implementation PIC, and PMU shall organize public meetings and will apprise the communities about the progress on the implementation of EMP in the subproject works

D. Consultation during Renovation

158. Public meetings with affected communities (if any) to discuss and plan work programs and allow issues to be raised and addressed once construction has started. Smaller-scale meetings to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation.

E. Project Disclosure

159. A communications strategy is of vital importance in terms of accommodating traffic during road closure. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. For the benefit of the community the IEE will be disclosed to the affected people and other stakeholders in a form and language(s) understandable to them at an accessible place in a timely manner and made available at: (i) PIU/PMU office; (ii) District Magistrate Office; and, office. It will be ensured that the hard copies of IEE are kept at such places which are conveniently accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE will be placed in the official website of the SDMA UEAP and the official website of ADB after approval of the IEE by ADB. The PIU will issue Notification on the locality-wise start date of implementation of the subproject. Copies of the IEE will be kept in the PMU/PIU office and will be distributed to any person willing to consult the IEE.

VII. ENVIRONMENTAL MANAGEMENT PLAN AND GRIEVANCE REDRESS MECHANISM

A. Environmental Management and Monitoring Plan (EMMP)

160. The EMMP designed will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between the Design & Supervision Consultants (GMVN) also an Engineer for the project, Contractors, and Field-Project Implementation Unit (F-PIU)/Project Management Unit (PMU). The EMMP identifies the three phases of development as:

(i) Pre-Construction (ii) Construction Phase; and (iii) Post-Construction/Operational Phase.

161. The purpose of the EMMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of: (i) providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with.

162. A copy of the EMMP must be kept on site during the construction period at all times. The EMMP will be made binding on all contractors operating on the site and will be included within the Contractual Clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance. It shall be noted that the Supreme Court of India* mandates those responsible for environmental damage must pay the repair costs both to the environment and human health and the preventive measures to reduce or prevent further pollution and/or environmental damage.

163. The Contractor is deemed not to have complied with the EMMP if:

a. Within the boundaries of the site, and site extensions, there is evidence of contravention of clauses;
b. If environmental damage ensues due to negligence;
c. The contractor fails to comply with corrective or other instructions issued by the Engineer/F-PIU/PMU within a specified time; and
d. The Contractor fails to respond adequately to complaints from the public.

B. Institutional Arrangements

164. The institutional arrangements specify the arrangements for the implementation of environmental provisions of the proposed subproject. The Executing Agency (EA) State Disaster Management Authority (SDMA) will work closely with the Implementing Agency (IA) Garhwal Mandal Vikas Nigam (GMVN) Limited for effective implementation of environmental

safeguards related requirements of the tourism infrastructure sub-projects. The institutional arrangements and responsibilities are detailed below.

165. The sub-project will be implemented and monitored by the F-PIU, GMVN under Uttarakhand Emergency Assistance Project (UEAP), which will be supported by GMVN (also working as Engineer) and overall management support shall be provided by PMU, UEAP, SDMA.

166. The Safeguard Staff of UEAP, SDMA (EA) in PMU, and IA will monitor the implementation of environmental covenants.

167. UEAP, SDMA (EA) shall be responsible for ensuring compliance to environmental requirements of the ADB as well as central/state governments and reporting the same to ADB. An Environmental Management and Monitoring Plan (EMMP) will be a part of contract with the civil works contractors engaged for execution of the works. The primary responsibility of implementation of EMMP is of the IA during pre-construction and operation and maintenance phases; and of the civil works Contractor during the construction phase as defined in the EMMP. The responsibility of supervision of EMMP implementation is of the GMVN; and it would guide the IA and the civil works contractors in this regard. , GMVN with IA and EA, UEAP will act as monitoring agency as delegated in EMMP. All applicable statutory environmental clearances, consents, and/or permits (at national, state and local levels) as required for the implementation of the sub-project would be obtained by the IA or by the civil works Contractor in line with India's national/state/local laws and regulations, and in accordance with ADB's SPS 2009 requirements.

I) **UEAP, SDMA (PMU)**

- Complies with all applicable legislation and is conversant with the requirements of the EMMP;
- Assesses all activities requiring special attention as specified and/or requested by the Engineer (GMVN) and/or Safeguards Staff of UEAP, SDMA for the duration of the Contract;
- May, on the recommendation of the Environmental Expert (EE), GMVN and/or Safeguards Staff of UEAP, SDMA, through the GMVN order the Contractor to suspend any or all works on site if the Contractor or his subcontractors/ suppliers fail to comply with the said contractual stipulations with respect to environment and EMMP; and
- Act as overall monitoring agency.
- Addressing complaints and redressal of grievances.

II) **UEAP, IA & F-PIU)**

- Ensures along with Engineer (PIU) that EMMP and all necessary environmental stipulations are carried in bidding documents and Contract documents with Contractor.

- Complies with all applicable legislation and is conversant with the requirements of the EMMP;
- Assesses all activities requiring special attention as specified and/or requested by the Engineer (GMVN) and/or Safeguards Staff of UEAP SDMA for the duration of the Contract;
- Ensures that the Contractor conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, as advised by the Engineer and/or Safeguards Staff of UEAP SDMA;
- May, on the recommendation of the EE, GMVN and/or Safeguards Staff of UEAP, SDMA, through the GMVN order the Contractor to suspend any or all works on site if the Contractor or his sub-contractors/ suppliers fail to comply with the said contractual stipulations with respect to environment and EMMP; and
- Act as supervising & monitoring agency as delegated in EMMP.

III) The Engineer PIU GMVN

- Guides EA, IA, F-PIU and Contractors with respect to environmental regulations and associated requirements, and facilitates ensuring compliance with those;
- Arranges information meetings for and consults with interested and affected parties about the impending construction activities;
- Maintains a register of complaints and queries by members of the public at the site office. This register is forwarded to the Project Manager of F-PIU on weekly basis;
- Enforces and monitors compliance the requirements of the EMMP on site;
- Assesses the Contractor's environmental performance in consultation with Environmental Expert; and
- Documents in conjunction with the Contractor, the state of the site prior to commencing construction activities.

IV) Environmental Safeguard Expert (PIU)

- Briefs the Contractor about the requirements of the Environmental Specification and/or EMMP, as applicable;
- Facilitates statutory compliance related activities for the IA and contractors;
- Advises the Engineer about the interpretation, implementation and enforcement of the Environmental Specification and other related environmental matters;
- Monitors and report on the performance of the Contractor/project in terms of environmental compliance with the EMMP to the Engineer and UEAP, SDMA ; and
- Provides technical advice relating to environmental issues to the Engineer.

V) **The Contractor**

- Appoints one full-time suitably qualified and experienced Environmental Safeguard Officer for implementation of EMMP including Environment Health & Safety (EHS) measures, community liasoning, reporting and grievance redressal on day to day basis
- Complies with all applicable legislation, is conversant with the requirements of the EMMP, and briefs staff about the requirements of same;
- Ensures any sub-contractors/ suppliers who are utilized within the context of the contract comply with the environmental requirements of the EMMP. The Contractor will be held responsible for non-compliance on their behalf;
- Supplies method statements for all activities requiring special attention as specified and/or requested by the Engineer or Environmental Expert (of Engineer) during the duration of the Contract;
- Provides environmental awareness training to staff;
- Bears the costs of any damages/ compensation resulting from non-adherence to the EMMP or written site instructions;
- Conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment;
- Ensures that the Engineer is timely informed of any foreseeable activities that will require input from the Environmental Expert (of Engineer);
- Receives complaints/grievances from public, discuss with GMVN, F-PIU & IA and take steps for implementation of remedial measures in consultation with the Engineer (GMVN), and reports to the Engineer (GMVN) on the status in its each monthly report till satisfactory resolution.

168. The proposed sub-project will be implemented by the F-PIU, Tourism (GMVN). The F-PIU will be responsible for supervision and monitoring of day-to-day implementation of subprojects including EMMP.

169. For monitoring of environmental parameters as outlined in the EMMP, appropriate monitoring agencies would be engaged by the contractor (cost has been included in each contract based on sub-project specific monitoring plans) or by the IAs for the monitoring works not included in the civil works contracts.

C. Environment Management

170. All works undertaken towards protection of environmental resources as part of the EMMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise

specified explicitly. The costs towards environmental management as per EMMP unless otherwise provided as a separate head, will be deemed to be part of the BOQ of the project. The scope of works of the Contractor towards the implementation of the environmental provisions shall be as follows:

a. Abide by all existing Environmental Regulations and requirements of the Government of Uttarakhand and Government of India, local level ULBs and Gram Sabha etc. during implementation.
b. Compliance with all mitigation measures and monitoring requirements set out in the EMMP.
c. Submission of a method statement detailing how the subproject EMMP will be complied with. This shall include methods and schedules of monitoring.
d. Monitoring of project environmental performance including performance indicators defined therein, and periodic submission of monitoring reports.
e. Compliance with all measures required for construction activities in sensitive areas, in line with the regulatory requirements of these protected areas, and the guidelines set forth in the management plans for these areas.
f. Compliance with all regulatory requirements associated with proximity of the sub-project to the International Borders based on assessment of Contractor in consultation with the Engineer GMVN.
g. Compliance of all safety rules and regulations applicable at work, and provision of adequate. Health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities besides all social and community related requirements as stipulated in EMMP.

171. The detailed provisions for specific environmental issues shall be as outlined in the EMMP table on impacts and mitigation measures. Key clauses are outlined in the following sections.

Quarry and Borrowing

172. The Contractor will identify and seek prior approval of the Engineer for quarrying and borrowing operations. Quarry and borrowing will be carried only from locations approved by the Department of Geology & Mining and State Pollution Control Board and no new quarries will be opened for the purposes of the project. Any deviation from the provisions will be immediately notified and approval of the Engineer is to be sought.

173. The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas so as to assure the stability and safety of the works and that any adjacent feature like houses and community assets especially along hill slopes are not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion. Stockpiling of materials (topsoil, fill material, gravel, aggregates, and other construction materials) shall not be allowed during

rainy season unless covered by a suitable material. Storage on private property will be allowed if written permission is obtained from the owner or authorized lessee.

174. Borrow areas and quarries shall be sited, worked, and restored in accordance with the specifications and as per the closure plan (approved by Engineer). Spoils shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements.

Debris Disposal

175. Dismantling of existing structures: Debris Disposal shall be maximum utilized and disposed as per norms after consultation with GMVN/F-PIU/PMU Safeguard Specialist. Due care shall be taken that any material falling under hazardous waste category is disposed in accordance with Hazardous Wastes (Management, Handling and Transboundary movement) Rules, 2008 and amendments till date Hazardous Wastes (Management, Handling and Transboundary movement) Rules, 2008 and amendments till date & applicable norms.

Precautions for Protection of Environmental Measures

176. The Contractor shall ensure that construction activities do not result in any contamination of land, air or water by polluting substances or cause noise generated by the activities. For cleaning activities and operation of equipment, the Contractor will utilize such practical methods and devices as are reasonably available to control, prevent and otherwise minimize air/noise pollution.

177. Unless otherwise provided in the specifications, the Contractor shall ensure that no trees or shrubs or other vegetation are felled or harmed except those required to be cleared for execution of the works for which all statutory permissions have been obtained. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer.

Air, Water & Noise Pollution, and Soil Contamination

178. All works will be carried out without unreasonable noise and air, water and soil pollution. Subject and without prejudice to any other provision of the Contract and the law of the land and its obligation as applicable, the Contractor will take all precautions outlined in the EMMP to avoid the air, water, soil and noise pollution. The Contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer. The Contractor shall reduce the dust emission due to construction activities by regular water sprinkling in the affected areas.

179. All the construction equipment and vehicles shall have Pollution under Control (PUC) Certificate to ensure that no air pollution is caused due to operation of their equipment and vehicles. All the construction equipment and vehicles should remain all time in good conditions up to satisfaction of site engineers.

180. The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

Occupational & Community Health and Safety during Construction

181. The Contractor shall, in accordance with the safety and health provisions specified in the EMMP, provide workers with a safe and healthy working environment, in the work areas, through application of preventive and protective measures consistent with international good practices, as reflected in internationally recognized standards. The contractors, Engineer, IAs and the EA will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by: Providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; Providing appropriate equipment to minimize risks and requiring and enforcing its use; Training workers and other staff; and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; Documenting and reporting occupational accidents, diseases, and incidents; Having emergency prevention, preparedness, and response arrangements in place; Provide First Aid facilities in all the work sites and workers camp and having qualified first aider to give first aid at the time of any accident. Contractor shall also organize periodic visits by a qualified registered medical practitioner to the site and workers camp. Contact information of Doctor, availability & location of first aid box shall be displayed in appropriate language both at work site and workers camp; Contractor should provide safe drinking water, clean eating and resting areas, separate toilets for male and female work force and sufficient amenities at work site and workers camps as per prevalent Labour law and EMMP. Contractor will ensure proper sanitation and would provide soak pits and septic tanks for disposal of waste water and sewage; Contractor should have prepared emergency response plan (to be approved by Engineer) with full details and methods of emergency response during any accident and shall have and display the emergency contact numbers at site; and Contractor should follow all the applicable rules and regulations for workers health and safety. The Contractor will also ensure that the interests of the community are disturbed to the minimum as envisaged in the EMMP. Provide barricade, signage and safety information in and around the construction site and also to prevent local people entering into the construction site.

Post-Construction Clearance

182. On completion of work, wherever applicable, the Contractor shall clear away and remove from the sites all constructional plant, surplus materials, rubbish, scaffoldings, and temporary works

of every kind and leave the whole of the sites and works in a clean condition as per agreed redevelopment plan to the satisfaction of the Engineer.

183. Construction camp sites and any other sites temporarily occupied during construction shall be cleared as specified in the contract and handed over to the Owner. It will be ensured by the Contractor that the site handed over is in line with the conditions of temporary acquisition signed by both parties. Contractor would obtain and furnish (to F-PIU) a certificate to this effect from the Owner.

D. Environmental Monitoring Plan

184. To ensure the effective implementation of mitigation measures and Environmental Management Plan during construction and operation phase of the sub-project, it is essential that an effective Environmental Monitoring Plan be followed as given in table below.

185. Monitoring is an essential component for sustainability of any developmental project. It is an integral part of any environmental assessment process. The monitoring program consists of performance indicators, reporting formats and necessary budgetary provision. The contractors monitoring methods and parameters should be in accordance with the norms prescribed by the Central Pollution Control Board (CPCB) standards for air, water, soil, and noise. Indicators and Targets for Environmental Performance are provided in the annexed table (No.) in Section E of this EMMP. The frequency of sampling and selection of sampling sites are sub-project specific.

186. The monitoring will be carried out by the contractor through approved agency accredited by National Accreditation Board for Testing and Calibration Laboratories and will be supervised by the Environmental Expert of the Design & Supervision Consultant. The monitoring plan is outlined in Table 1 below.

Table: VII-1. Environment Monitoring Plan

Indicators	Parameters to be Monitored	Frequency	Responsibility
Pre- Construction Stage			
Legislation, permits and Agreements	Permissions,/ NoCs/Consents other statutory requirement	Once in Pre-Construction Stage	Contractor, GMVN, IA & EA
Environmental Baseline Data Generation	Ambient Air Quality, Noise level, Water Quality & Soil characteristics as per parameters outlined in EMMP	Once in Pre-Construction Stage	Contractor
Debris disposal	Safe disposal of construction wastes including bituminous wastes (Authorized vendor)	Random checks	Contractor
Construction Stage			

Legislation, permits and Agreements	Permissions,/ NoCs/Consents other statutory requirement	Continuous	Contractor, GMVN, LA & EA
Dust suppression	No. of tankers for water sprinkling, Timing of sprinkling, Location of sprinkling (log books to be maintained)	Random checks	Contractor
Ambient air quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO.	Once in a Quarter where work is in progress and near sensitive receptors; and at the construction camp sites (except monsoon) for the entire construction period	Contractor, to be monitored through NABL Accredited Laboratory
Ambient noise	Equivalent Day & Night Time Noise Levels (Leq)	Once in a quarter where work is in progress and near sensitive receptors during construction stage.	Contractor, to be monitored through NABL Accredited Laboratory
Water Quality	pH, Conductivity, Colour, Odour, Turbidity, Total Hardness($CaCO_3$) BOD, Iron (as Fe) m Chloride as (Cl), Residual Free Chlorine. Calcium Hardness, (as Ca) Magnesium Hardness (as Mg) Copper as Cu, Total dissolved Solid, Total Coliform E. Coli.	Once in a quarter where work is in progress and near sensitive receptors during construction stage	Contractor, to be monitored through approved NABL Accredited Laboratory
Soil	pH, Conductivity, Chloride as Cl, Potassium as K, Organic Matter , Available Nitrogen, Phosphorus, Sulphate as SO_4, Water Holding Capacity, Porosity heavy metals (including Lead, cadmium, Zinc and Pesticides)	Once in a quarter where work is in progress and near sensitive receptors during construction stage	Contractor, to be monitored through NABL Accredited Laboratory
Heritage Protection, if needed	Visual Inspection of works, compliance with ASI regulations and norms	Continuous	ASI/E-PIC
Supply of PPE	Usage of PPE on site, adequacy of equipment	Continuous	Contractor
Establishing Medical facilities	Access to health facilities for the construction workers	Continuous	Contractor

Accident record	No. of fatal accidents at work site, No. of injuries, No. of disabilities	Continuous	Contractor
Post construction clearance of site	Physical field verification and Satisfaction certificate from owner: Whether temporary locations for workers camp, site office, batching plant and other construction locations are restored to pre-project conditions as per approved closure plan	Post-construction	Contractor
Operation & Maintenance Stage			
Water quality	All parameters as per CPCB standards	Once in year during operation stage	PMU, SDMA
Disposal of Solid Waste	Proper disposal of Solid Waste (domestic) generated shall be ensured in accordance with the prevalent norms		

Budget covered in subsequent cost Table, however, would be finalized based on subproject specific requirements at IEE stage. Contractor will obtain a copy of approved IEE and keep available at construction site and site office(s) for proper implementation of IEE & EMMP.

E. Environmental Budget

187. As part of good engineering practices in the project, there have been several measures as erosion prevention, rehabilitation of borrow ar eas, safety, signage, provision of temporary drains, etc., the costs for which will be included in the design costs (site development cost) of specific subprojects. Therefore, these items of costs have not been included in the IEE budget. Only those items not covered under budgets for construction are included in the IEE budget.

188. The Contractor's cost for site establishment, preliminary, construction, and defect liability activities will be incorporated into the contract agreements, which will be binding on him for implementation and Uttarakhand Jal Sansthan as Implementing Agency and GMVN to ensure the compliance. The air, soil, water quality, and noise level monitoring during construction and defect liability phases will be conducted by the contractor for which provision has been kept in Environmental budget of EMMP.

189. These are small construction projects, therefore, it is not expected to cause much significant air, water, soil and noise pollution. The main EMMP cost will arise from monitoring of environmental parameters (air, soil, water and noise).

190. The costs of water sprinkling for dust suppression and providing personal protective equipment to construction workers shall be borne by contractor as part of conditions of contract. In addition the

sources of funds for Mitigation measures during construction stage including monitoring durin construction stage are also to be borne by the contractor. These are deemed to be included as pa of the contract price amount quoted by the contractor for the works. The costs for generation o baseline data and monitoring shall be borne by the contractor. The locations for baseline data generation & monitoring shall be identified during IEE preparation. The baseline data will be generated prior to commencing with civil works. The costs of components for monitoring during operation and maintenance stage and the capacity building costs are to be funded by the PMU. The EMMP cost is given in the Table VIII-2 below.

191. Most of the mitigation measures require the contractors to adopt good site practice, which shou be part of their normal procedures already, so there are unlikely to be major costs associated wi this compliance. Only those items not covered under budget for construction are included in the IEE budget. The IEE costs include mitigation, monitoring and capacity building costs. The summary budget for the environmental management costs for the subproject based on construction period stipulated in the bidding document is presented in Table below:

Table VIII-2: Environmental Management & Monitoring Costs

S. No	Particulars	Stages	Unit	Total number	Rate (INR)	Cost (INR)*	Source of fund
A	Legislations, permits and agreements	Consent to establish and consent to operate for plants and machinery of the contractor					The cost for clearance, permits, and consents required by IA & Contractors shall be borne by them respectively
B	Public consultations and information disclosure	Pre construction phase Construction phases	Lump sum	11	10,000.00	11,00,00.00	F-PIU GMVN Contractor
C.	**Environmental Baseline Data Generation**						
1	Ambient air quality	Preconstruction	Per sample	11	15,000	1,65,000	Contractor cost
2	Noise quality			11	5,000	55,000	
3	Water quality (Drinking water)			11	9,200	1,01200	
4	Soil Quality			11	8,000	88,000	
D	**Environmental Monitoring**						
1	Ambient air quality	Construction	Per sample	33	15,000	4,95,000	
2	Noise quality			33	5,000	1,65,000	
3	Water quality (Drinking water)			33	9,200	3,03600	
4	Soil Quality			33	8,000	2,64,000	
E	Dust Suppression at construction sites	Construction and Defect Liability period	Lump sum			5,00,000	
1	Ambient air quality	Operation and defect liability period	Per sample	11	15,000	1,65,000	Implementing Agencies cost/ Contractors cost
2	Water quality			11	9,200	1,01,200	
3	Noise quality			11	5,000	55,000	
F	**Capacity Building (Includes cost estimates for entire sub project area not included in the package costs)**						
1	Capacity Building Expenses 2 sessions	EMP training at site implementation of EMMP for field PIUs and Engineer		11	10,000	1,10,000	Contractor cost

F. Environmental Monitoring and Reporting

192. The PMU will monitor and measure the progress of EMMP implementation. Safeguards Staffs of IA / FPIU will undertake site inspections and document review to verify compliance with the EMMP and progress toward the final outcome. Environment and Safety Officer of the Contractor will submit the monitoring of EMMP to the GMVN/Engineer on day to day basis. GMVN / Engineer will submit monthly EMMP monitoring and implementation reports to FPIU, who will take follow-up actions, if necessary. FPIU/IA will submit quarterly monitoring and implementation reports to PMU. The PMU will submit semi-annual monitoring reports to ADB based on reporting of FPIU/ IA and its safeguards staff assessment of the implementation performance and its verification by the PMU safeguards specialist. PMU will also take corrective actions as required.

193. Monitoring reports will be posted in a location accessible to the public.

194. ADB will review project performance against the EA's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the Project's risks and impacts. Implementation of social and environmental safeguards related requirements will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued.

Table VII-3: Standardized EMMP to guide the Contractor in mitigating environmental impacts

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
1.	**Site Establishment and Preliminary Activities Impacts**				
1.1	Legislation, Permits and Agreements	In all instances, EA, IA contractors and consultants must remain in compliance with relevant environmental legislation of India at the national, state and local levels.	1. Permissions,/ NOCs/Consents requirement IA 2. Permissions / NOCs/Consents requirement for equipment/machineries, Borrow area/ queries etc. – Contractor	PMU, GMVN	IA, Contractor
		Proof of compliance to statutory requirements must be forwarded by the facility owner contractor to PMU/F-PIU in relation to hot mixing, stone crushers, diesel generators etc	ESO-Contractor, Engineer, & Environmental Expert F-PIU.	PMU, F-PIU	
		A copy of the EMP must be kept on site during the construction period	ESO-Contractor, Engineer & EE	F-PIU, IA & PMU	
1.2	Education of site staff on general and Environmental Conduct[1]	Ensure that all site personnel have a basic level of environmental awareness training	ESO-Contractor and EE EE to deliver	IA & PMU	Contractor, IA
		Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitized to any potential hazards associated with their task	Environment and Safety Officer of Contractor, and EE	F-PIU, IA & PMU	
		No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor	Contractor and EE	F-PIU, IA & PMU	
		All employees must undergo safety training and wear the necessary protective clothing /equipment	Contractor and EE	IA & PMU,	

[1] These points need to be made clear to all staff on site before the work commences.

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: • No alcohol / drugs to be present on site; • Measures for abatement of noise due to construction related activities and conduct of work force; • Construction staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. use of firewood for cooking, the use of surroundings as a toilet facility are forbidden); • Trespassing on private / commercial properties adjoining the site is forbidden; and • Other than pre-approved security staff, no workers shall be permitted to live on the construction site. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.	Contractor and EE	IA & PMU	
1.3	Social Impacts	Open liaison channels shall be established between the Site owner, operator, the contractors and interested and affected parties such that any queries, complaints or suggestions pertaining to environmental management aspects can be dealt with quickly and by the appropriate person(s).	Environment and Safety Officer of Contractor with the Engineer, EE & F-PIU	IA & PMU,	Contractor
		A communications strategy is of vital	Contractor with the Engineer, EE	IA & PMU,	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		importance in terms of accommodating traffic during road closure. The road closure together with the proposed detour needs to be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.	& F-PIU		
		Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Contractor with the Engineer, EE & F-PIU	IA & PMU	
		Storage facilities, elevated tanks and other temporary structures on site shall be located such that they have as little visual impact on local residents as possible.	Engineer and EE	IA & PMU	Contractor
		In areas where the visual environment is particularly important (e.g. along commercial/ tourism routes) or privacy concerns for surrounding buildings exist, the site may require screening. This could being the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction.	Engineer and EE	IA & PMU	
		Special attention shall be given to the screening of highly reflective materials on site.	EE	IA & PMU	
1.4	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created and the architectural/archaeological character of the surroundings	Design will include provisions for ensuring effective maintenance and protection of the assets created so as to ensure the long term sustainability.	Contractor, Engineer, EE, and F-PIU	IA & PMU	IA
	Design Impacts and Pre-construction Impacts				

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
2.					
2.1	Layout of components to avoid impacts on the aesthetics of the site	The project components siting will avoid impacts on the aesthetics of the site, ensure minimal impacts and in compliance with statutory and regulatory requirements.	Engineer, EE, and F-PIU	IA & PMU	IA
2.2	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, and addition of paved surfaces	Design of proposed components will enable efficient drainage of the sites and maintain natural drainage patterns.	Engineer, EE, and F-PIU	IA & PMU	IA
2.3	Selection of materials and construction technologies. if not carefully chosen, will adversely impact the aesthetic appeal of the destinations	Selection of materials will be from approved sources and construction technologies proposed will strictly conform to the Uttarakhand architecture. Any new landscaping elements will only utilize native species. Material selection would be done keeping in view that no asbestos (except as allowed), and CFC is used.	Engineer, EE, and F-PIU	IA & PMU	IA
2.4	Socio cultural resources- Ground disturbance can uncover and damage archaeological and historical remains	Consult Archaeological Survey of India (ASI) and/or concerned Dept. of Uttarakhand Govt. as applicable to obtain an expert assessment of the archaeological potential of the site; Consider alternatives if the site is found to be of medium or high risk; and Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.	Engineer, EE, and F-PIU	Contractor, IA & PMU	IA
2.5	Integration of energy efficiency and energy	The detailed designs for the sub-project components shall ensure that	Engineer, EE, and F-PIU	IA & PMU	IA

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
	conservation programs in design of sub-project components	environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, rainwater harvesting etc.			
2.6	Site clearance activities, including delineation of construction areas	Any removal of vegetation or tree felling shall be done after taking statutory permissions if required. All works shall be carried out such that the damage or disruption of flora other than those identified for cutting is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Environmental safeguard Expert of PIU. All areas used for temporary construction operations will be subject to complete restoration to their former condition with appropriate rehabilitation procedures as per the rehabilitation plan prepared by the contractor and approved by the EE of PIU.	Contractor	Engineer, EE, and F-PIU	Contractor
3	**Construction Impacts**				
3.1	Construction Camps - Location, Selection, Design and Layout	Siting of the construction camps shall be as per the guidelines below and details of layout to be approved by PIU. Construction camps shall not be proposed within 500 m from the sensitive receptors, nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. Location for stockyards for construction materials shall be identified at least 300 m away from watercourses. Construction camps will be located	Contractor with the Engineer and EE	F-PIU, IA & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		away from settlements and drainage from and through the camps will not endanger any domestic or public water supply. Construction camps including sanitation facilities must be adequately drained. Sewage management though septic tanks and solid waste management though local ULB system or other alternate measures.			
3.2	Drinking water availability	Sufficient supply of cold potable water to be provided and maintained. The water quality shall be as per standard norms for drinking water. If the drinking water is obtained from an intermittent public water supply then storage tanks will be provided. The cleanliness of the storage tanks will be ensured and all measures to be taken to avoid any water contamination.	Contractor	Engineer and EE	Contractor
3.3	Waste disposal	Pre-identified disposal location (identified by Contractor and approved by EE-PIU) shall be part of Comprehensive Waste Disposal Plan Solid Waste Management. Plan to be prepared by the Contractor in consultation and with approval of Environmental Safeguard Expert of PIU. The Environmental Specialist of PIU shall approve these disposal sites after conducting a joint inspection on the site with the Contractor. Wherever, possible Solid waste management shall be through local ULB system or other alternate measures. Contractor shall ensure that waste shall	Contractor with the Engineer	F-PIU, IA & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		not be disposed off near the water course or agricultural land, Orchards and Natural Habitats like Grasslands.			
3.4	Stockpiling of construction materials	Stockpiling of construction materials does not impact obstruct the drainage and Stockpiles will be covered to protect from dust and erosion.	Contractor with the Engineer	F-PIU, IA & PMU	Contractor
3.5	Quarry operations	Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. The Contractor shall obtain materials from approved quarries only after consent of the Department of Mines and Geology and District Administration. Adequate safety precautions will be ensured during transportation of quarry material from quarries to the construction site. Vehicles transporting the material will be covered to prevent spillage.	Contractor with the Engineer	F-PIU, IA & PMU	Contractor
3.6	Arrangement for construction water	The Contractor shall use ground/surface water as a source of water for the construction with the written consent from the concerned Department. To avoid disruption/ disturbance to other water users, the Contractor shall extract water from fixed locations and consult PIU & line agencies before finalizing the locations. The Contractor shall provide a list of locations and type of sources from where water for construction shall be extracted. The Contractor shall need to comply	Contractor with the Engineer	F-PIU, IA & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		with the requirements of the State Ground Water Department for the extraction and seek their approval for doing so and submit copies of the permission to PIU.			
3.7	Soil/Land Erosion	Slope protection measures will be undertaken as per design to control soil erosion.	Contractor with the Engineer	EPIU, IA & PMU	Contractor
3.8	Water Pollution from Construction Wastes	The Contractor shall take all precautionary measures to prevent entering of wastewater into streams, water bodies or the irrigation system during construction Contractor shall not wash his vehicles in river/stream water and shall not enter riverbed nearby the water resource area for that purpose.	Contractor with the Engineer	Engineer, F-PIU & PMU	Contractor
3.9	Water Pollution from Fuel and Lubricants	The Contractor shall ensure that all construction vehicle parking locations, fuel/ lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites shall be located at least 300 m away from rivers/streams and irrigation canal/ponds if any Contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and refueling shall be carried out in such a manner that spillage of fuels and lubricants does not contaminate the ground. Wastewater from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be collected and separated through an oil interceptor before discharging it on land or into other treatment system as per specified standards and UEPPCB and ULB norms	Contractor	EE of Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		if any.			
3.10	Soil Pollution due to fuel and lubricants, construction waste	The fuel storage and vehicle cleaning area will be stationed such that spillage of fuels and lubricants does not contaminate the ground. All pollution parameters will be monitored as per monitoring plan. Wastewater from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be collected and separated through an oil interceptor before discharging it on land or into other treatment system.	Contractor	Engineer, F-PIU & PMU	Contractor
3.11	Generation of dust	The Contractor will take every precaution to reduce the levels of dust at construction site. Regular sprinkling of water and Stockpiles of soil will be kept covered in such a manner to minimize dust generation.	Contractor	Engineer, F-PIU & PMU	Contractor
3.12	Emission from Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery used for construction shall confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 shall be strictly adhered to. The use of silent/quiet equipment compliant with India ambient noise standards and standards specified for manufacturers shall be encouraged in the sub Project. The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced for verification	Contractor	Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		whenever required.			
3.13	Noise Pollution	The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the MoEF/CPCB noise standards and all Vehicles and equipment used in construction shall be fitted with exhaust silencers. At the construction sites noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am. Noise limits for construction equipment used in this project will be in conformity to the BIS/SPCB/CPCB standards Regular monitoring of ambient noise levels to ensure compliance to Uttarakhand Environment Protection &Pollution Control Board standards.	Contractor with the Engineer	EE, F-PIU & PMU	Contractor
3.14	Material Handling at Site	Workers Employed on mixing cement, lime mortars, concrete etc., will be provided with protective footwear and protective masks and goggles. Workers, who are engaged in welding works, will be provided with welder's protective eye-shields. Workers engaged in stone breaking activities will be provided with protective goggles, masks, and clothing. The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions and applicable regulations. The Engineer	Contractor	Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.			
3.15	Disposal of Construction Waste / Debris / Cut Material	The Contractor shall confirm that Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed around the project site indiscriminately.	Contractor	Engineer, F-PIU & PMU	Contractor
3.16	Safety Measures During Construction	Personal Protective Equipment for workers on the project and adequate safety measures for workers during handling of materials at site will be taken up. The Contractor has to comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. The Contractor has to comply with all regulations for the safety of workers. Precaution will be taken to prevent danger of the workers from fire, etc. First aid treatment will be made available for all injuries likely to be sustained during the course of work. Contractor shall also organize periodic visits by a qualified registered medical practitioner to the site and workers camp. Contact information of Doctor, availability & location of first aid box shall be displayed in appropriate language both at work site and workers	Contractor	Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		camp. The Contractor will conform to all anti-malaria instructions given to him by the Engineer. The Contractor will also ensure that the interests of the community are preferably not disturbed, and if unavoidable then disturbed to the minimum. Provide traffic management personnel, barricade, appropriate signage and safety information in and around the construction site and prevent local people entering into the construction site.			
3.17	Clearing of Construction of Camps and Restoration	Contractor to prepare site restoration plans for approval by the Engineer. The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer and facility owner.	Contractor	Engineer, F-PIU & PMU	Contractor
3.19	Risk of archaeological chance finds	Strictly follow the protocol for chance finds in any excavation work; Request FPIU or any authorized person with archaeological field training to observe excavation; Stop work immediately to allow further investigation if any finds are suspected; and Inform FPIU, and take any action they require ensuring its removal or	Contractor	Engineer, FPIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		protection in-situ.			
3.20	Conflict with locals	Contractor shall ensure that mostly the local labourers are employed and migratory laborer shall be employed only in case of unavoidable circumstances.	Contractor	Engineer, F-PIU & PMU	Contractor
3.21	Environment Safeguard Officer	Contractor shall appoint one full-time suitably qualified and experienced Environment and Safety Officer who shall be responsible for assisting contractor in implementation of EMMP, community liaising, consultations with interested/affected parties, reporting and grievance redressal on day-to-day basis. This environment and safety officer will be at site till all works related to the project including demobilization are completed.	Contractor	Engineer, F-PIU & PMU	Contractor
4	**Operation and Maintenance impacts**				
4.1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise level, water (both ground, surface water) quality and soil, in the subproject area as suggested in pollution monitoring plan through an approved monitoring agency.	Pollution Monitoring Agency appointed by IA	SDMA, PMU	Dept. Of Tourism, GoUK
4.2	Increased Pollution load on the Ecosystem in peak tourist season	Increased Pollution load will be addressed through better facilities. Wherever, possible Solid waste management shall be through local ULB system or other alternate measures. Trampling impacts on vegetation and soil will be minimized by designating proper walkways in and around proposed facilities. Proper parking facilities and traffic management for catering to increased vehicle movement	IA, EA and Tourism Department	SDMA, PMU & GoUK	Dept. Of Tourism, GoUK

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		shall be provided. The project (UEAP) will have positive impacts on the socio economic conditions of people of project area by way of providing better road connectivity, water supply & allied facilities Tourism Infrastructure and emergency rescue, evacuation facilities. As per Loan covenants of UEAP: a) EA shall prepare guidelines for new infrastructure to be developed under the sector; (b) prepare master plan for redevelopment of Kedarnath Dham; and (c) undertake the carrying capacity and tourist regulation studies and measures thereof .			
4.3	Unhygienic condition due to poor maintenance of sanitation facilities and irregular solid waste collection	Tourism department will carry out maintenance of the existing toilets, and carry out the regular collection and disposal of wastes as per norms. New facilities proposed to be created under UEAP will cater to additional load.	IA, Tourism Department	IA / Dept. Of Tourism, GoUK	Dept. Of Tourism, GoUK

EE= Environmental Expert of Engineer (GMVN), GMVN= Design & Supervision Consultants, IA= Implementing Agency, EA= Executing Agency, FPIU= Field Project Implementation Unit (GMVN)

G. Performance Indicators

195. The performance indicators of implementation of environmental management and monitoring plan have been provided in below table.

Table VII-4: Performance Indicators of EMMP

S.No	Performance Indicators	Target	Achievements Annually & Semiannually
1	Budget	Environmental Budget (EMMP Budget)	Expenditure till date
Performance Indicators of Monitoring Plan			
2	Ambient Air Quality	Total number of samples as per Environmental Monitoring Plan (EMP)	Total number of samples collected
3	Noise Level	Total number of samples as per EMP	Total number of samples collected
4	Water Quality	Total number of samples as per EMP	Total number of samples collected
5	Soil	Total number of samples as per EMP	Total number of samples collected
6	Safety of Workers	List of PPE as per number of labors	List of PPEs actually provided in the project
Performance Indicators of Environmental Management Plan			
7	Permissions/NOCs/Consents requirement	Target timeline to obtain the permit/ NOC/ Consents and its validity	List of permission and NOCs/ Consents obtained till date and status of its validity
8	Public Consultation	Total number of planned public consultation with timeline and coverage of people	Date and actual coverage of the people
9	Grievance redressal	Total number of complaints received, its timeline to response and resolution	Actual number of complaints resolved in percentage, response time
10	Issues raised in Public consultation	Target to attend the issues raised in the Public Consultation	Status of compliance to the issues of Public Consultation
11	Information disclosure	List of information and locations where information to be disclosed	Actual locations where information has been disclosed
12	Education of site staff on Environmental training	Total number of staffs to be trained	Number of staff actually trained
13	Capacity Building	Total number of sessions to be covered. Total number of contractors, PIUs and GMVNs to be covered	Number of sessions completed and number of contractors, PIUs and GMVNs
14	Implementation of EMP mitigation measures	All items of Environmental Management Plan with timeline and its respective regulatory standards like for Ambient air quality, NAAQS2009 standards, Drinking water IS:10500 etc, Residual Chlorine CEPPCB standards and CPHEEO manual for handling	Implementation status of EMP items till date
15	Reporting	List and number of report to be submitted	

F. Grievance Redress Mechanism

196. The EA will establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the Projects environmental performance. The project-specific grievance redress mechanism (GRM) is not intended to bypass the governments own redress process; rather it is intended to address affected people's concerns and complaints promptly, making it readily accessible to all segments of the affected people and is scaled to the risks and impacts of the Project.

197. The PMU and PIUs will make the public aware of the GRM through public awareness campaigns. Grievances can be filed in writing using the Complaint Register and Complaint Forms (Appendix 5) or by phone with any member of the PMU or PIU. The contact phone number of the PIUs and the PMU will serve as a hotline for complaints and will be publicized through the media and placed on notice boards outside their offices and at construction sites. The safeguard documents made available to the public in an accessible version will include information on the GRM and will be widely disseminated throughout the corridor by the safeguards officers in the PMU and PIUs with support from the NGO engaged to implement the Community Awareness Program.

198. The PIUs will convene Grievance Redress Committees (GRC) within one week of the voiced grievance at the project level consisting of members of local government, NGOs, project staff, and representatives of the affected people. Decisions on the grievance are to be made within 15 days of committee forming. If the grievance cannot be solved, the PMU is notified to further advice on the situation with higher government and legal bodies.

199. The GRC will ensure rights of vulnerable and poor are included. The grievance mechanism will be scaled to the risks and adverse impacts of the Project. It will address affected people's concerns and complaints promptly, using an 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. The affected people will be appropriately informed about the mechanism.

The PIU officers will be responsible for processing and placing all papers before the GRC, maintaining database of complaints, recording decisions, issuing minutes of the meetings and monitoring to see that formal orders are issued and the decisions carried out. All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by the PMU.

200. The safeguard monitoring reports will include the following aspects pertaining to progress on grievances: (i) number of cases registered with the GRC, level of jurisdiction (first, second and

third tiers), number of hearings held, decisions made, and the status of pending cases; and (ii) lists of cases in process and already decided upon may be prepared with details such as Name, ID with unique serial number, date of notice, date of application, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e., open, closed, pending).

VIII. CONCLUSION AND RECOMMENDATION

201. The proposed subproject components do not involve any interventions in and around the natural and cultural heritage destinations and have less significant (direct/indirect) environmental impacts. It is expected that the proposed subproject will enhanced economic growth and provision of livelihood opportunities for local communities through tourism infrastructure development with a focus on preservation and development of natural and cultural heritage and incidental services. The proposed Project under the Facility is provided to support the State of Uttarakhand, to enhance and develop the tourism sector as a key driver for economic growth.

202. This IEE has identified minor likely impacts on water, air and noise during construction and operation period and has defined mitigation measures. Those mitigation measures will be implemented and monitored during the sub-project execution. Further, the provision of environmental infrastructure, including access to sanitation and waste management facilities within the tourist areas, will better the environmental conditions and minimize the pollution related and aesthetic quality.

203. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the subproject. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the PMU/PIU supplemented with the technical expertise of a Safeguards Specialist as part of the GMVN Consultants. Further, the environmental monitoring plans provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages.

204. On the basis of the IEE It is expected that the proposed project components have only minor, negative, localized, temporary and less significant environmental impacts. These impacts can be easily mitigated through adequate mitigation measures and regular monitoring during the Design, Construction and Post Construction Phase of the project. It is recommended that PMU/PIU should have monitoring responsibility in environmental issues of all program components and to ensure the environmental sustenance.

205. In conclusion, the sub-project will have overall beneficial impacts after completion in terms of enhancement in emergency preparedness by construction of LGFS, Multipurpose Halls, Night Shelters and promotion of climatic resilient tourism by construction of eco friendly dwelling units. Though the construction work entails very less civil works, since major part involves installation of LGFS structures, designed for the weather extremes and sensitivities of the affected areas Negative impacts on water & air quality, noise levels, and soil during civil works & operation phase, which will be appropriately monitored and adequately mitigated. This report has not identified any comprehensive, broad, diverse or irreversible adverse impacts caused by the sub

project. It is recommended that project can be implemented with proper mitigation measures to protect the environment.

206. The IEE carried out for the subproject show that the proposed sub-components will result in net environmental benefits, and that any adverse environmental impact can be addressed through proper location, planning, and design of the proposed subproject; control of construction activity and mitigation measures. The EMP provides for mitigation of all identified impacts and the contract clauses for the environmental provisions will be part of the civil works contracts. Further, the proposed subproject elements have been consulted with the stakeholders and no significant issues requiring redressal in terms of environmental safeguards exist.

207. Based on the findings of the IEE, the classification of the subproject as Category B is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009).

Annexure- 1

Due diligence note for IEE for renovation/upgradation works at Badrinath under Package UK/UEAP/PIU –T (GMVN)/DDN/09.

In order to ensure comfortable stay and to provide modern facilities to Tourists/Pilgrims visiting Badrinath shrine. Renovation/Up gradation of existing accommodation is proposed. These TRHs lie in buffer zone of Nanda Devi Biosphere Reserve. The area of buffer zone is 5,148.6 sq km. It surrounds the core zone on all sides. Services and activities are managed in a way that protects the core zone. There are 47 villages in the –-333buffer zone. The services and activities include restoration, sites for enhancing value addition to the resources, limited recreation, tourism, grazing, etc., which are permitted to reduce its effect on core zone. Implementation of the project will not have any adverse impact on ecology and environment of the locality as the works proposed are of renovation and up-gradation of the existing TRH building within GMVN premises.

Since the project does not involve any new construction activity, hence no environmental pollution would be generated. No fresh construction will be undertaken in the premises of the travelers lodge and Yatri Niwas and only interior and furnishing works are being undertaken. During renovation/upgradation works, it will be ensured that there is no wastage of water and moreover availability/quality of water of the locality will not be affected. As the quantum of civil work to be executed is less, water will not be over utilized. Noise will not be created beyond permissible decibel levels. The renovation/upgradation works will not result in soil erosion. No hazardous/toxic material would be used. No construction debris will be left at the construction site; all the waste and debris will be utilized for leveling and site development purposes. The requirement of labour shall mostly be met from the locality itself. If local labor is not available then the influx of migrant labour population is likely to occur which may impart pressure on the local resources of the area. However, the nature of impacts would be intermittent & temporary. The route used for transport of material to the place of work would be National Highway 58, the main road to Badrinath shrine, on which thousands of pilgrims travel on regular basis. The vehicles transporting the material for the renovation work shall strictly confirm to CPCB standard. The provision of solid waste management and dust separation by water sprinklers has been made by the State Govt. There is an existing sewerage system at Badrinath for disposal of sewerage. A Sewage Treatment Plant is also sanctioned under National Ganga River Basin Authority (NGRBA) program to cater the sewage of Badrinath Town. PIU tourism has sought permission from Director, Nanda Devi Biosphere Reserve (NDBR) and Divisional Forest Officer (DFO), Chamoli district and for the renovation/upgradation works in Badrinath vide letter no. 156/PIU GMVN Tourism (Garhwal) dated 29/6/16 and 150/PIU-Tourism (Garhwal) dated 25/6/16 and respectively. The contractor will be mobilized only after obtaining the requisite permission.

Therefore, it can be concluded that the impact of the proposed renovation/upgradation works would be negligible on the ecology and environment and the category of the work remains unchanged i.e. "category B".

PROJECT IMPLEMENTATION UNIT –Tourism (Garhwal)
Uttarakhand Emergency Assistance Project (UEAP)
74/1 RAJPUR ROAD, GMVN BUILDING, DEHRADUN – UTTARAKHAND, PIN: 248001
Tel +91-135-2746817/2748309/2742171, Fax.+91-135-2746847
Email: ueap.piutourism.gmvn@gmail.com

Ref: 158/PIU-GMVN–Tourism (Garhwal) Dated: 29/6/2016

To,

Director
Nanda Devi Biosphere Reserve
P.O.-Gopeshwar,
Distt.-Chamoli-246401

Sub:- Regarding Issuance of NOC for Renovation & Up-gradation Works of Tourist Rest Houses at Badrinath

Dear Sir,

Renovation and Up-gradation works of the Travelers' Lodge and 500 beded Yatri Niwas at Badrinath is in progress under package no. UK/UEAP-T(GMVN)/DDN/08 under Uttarakhand Emergency Assistance Projects (UEAP) funded by Asian Development Bank (ADB). As the above sites are in close proximity of Nanda Devi Park, the NOC from the Forest Department for the execution of interior and furnishing works in the existing Tourist Rest Houses (TRHs) is to be obtained as per ADB's requirement and direction given by Chief Secretary-HPC, USDMA during the HPC meeting held on 30th May 2016.

This is to bring to your kind notice that no fresh construction is being undertaken in the premises of these TRHs and only interior and furnishing works are being undertaken so, there would be no adverse impact on the environment during the execution of said renovation and up-gradation works.

You are therefore requested to issue NOC for the same.

Yours Sincerely

29/6/16
(Atul Kumar Gupta)
Program Manager
UEAP-PIU(T), GMVN

Copy to following for kind information:

1. Chief Secretary/Chairman-HPC
2. Program Director, UEAP/UDRP
3. Divisional Forest Officer, Nanda Devi National Park, Forest Complex, P.O. Joshimath-246443
4. Project File

29/6/16
Program Manager

30-6-16

PROJECT IMPLEMENTATION UNIT –Tourism (Garhwal)
Uttarakhand Emergency Assistance Project (UEAP)
74/1 RAJPUR ROAD, GMVN BUILDING, DEHRADUN – UTTARAKHAND, PIN 248001
Tel +91-135-2742044, Fax +91-135-2746847
Email: ueap.piutourism.gmvn@gmail.com

Ref: 150/ PIU-Tourism (Garhwal) Dated: 26/6/2016

Divisional Forest Officer,
Chamoli

Sub: Regarding issuance of NOC for Renovation & Up gradation works of Tourist Rest Houses at Badrinath

Dear Sir,

Renovation and Up gradation works of the Travellers' Lodge and 500 bedded Yatri Niwas at Badrinath is in progress under package no. UK/UEAP-T (GMVN)/DDN/08 under Uttarakhand Emergency Assistance Projects (UEAP) funded by Asian Development Bank (ADB). As the above sites are in close proximity of Nanda Devi National Park, the NOC from the forest Department for the execution of interior and Furnishing works in the existing Tourist Rest Houses (TRHs) is to be obtained as per ADB's requirement and directions given by Chief Secretary/Chairman-HPC,USDMA during the HPC meeting held on 30th May 2016.

This is to bring to your kind notice that no fresh construction is being undertaken in the premises of these TRHs and only interior and furnishing works are being undertaken so, there would be no adverse impact on the environment during the execution of said renovation and up gradation works.

You are therefore requested to issue NOC for the same.

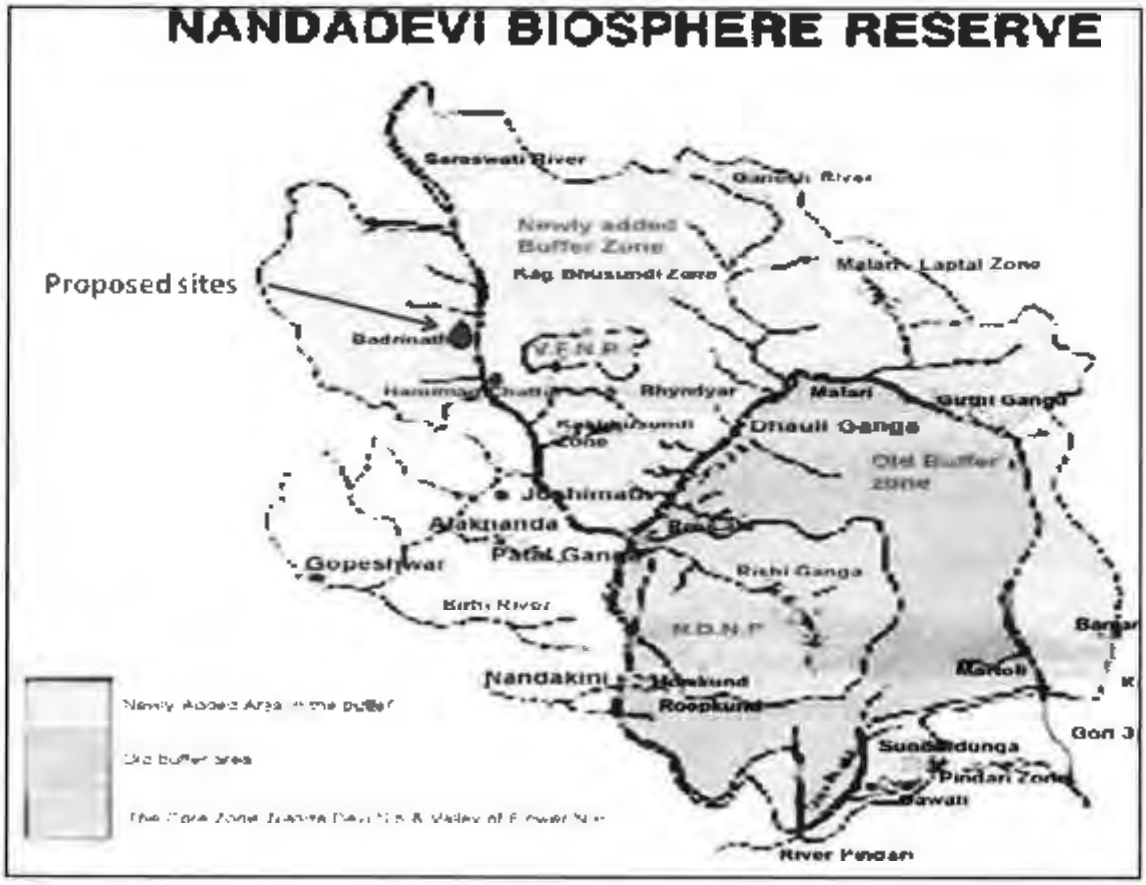
Yours sincerely

(Atul Kumar Gupta)
Program Manager
UEAP-PIU (T), GMVN

Copy to following for kind information :
1. Chief Secretary/Chairman-HPC
2. Program Director, UEAP-PIU (T),GMVN
3. Project file

Program Manager

Annexure II


NANDADEVI BIOSPHERE RESERVE
Saraswati River
Newly added Buffer Zone
Proposed sites
Malari- Laptal Zone
Badrinath
V.F.N.P.
Rhyndyar
Malari
Dhauli Ganga
Old Buffer zone
Alaknanda
Gopeshwar
Rishi Ganga
Birthi River
N.D.N.P.
Nandakini
Roopkund
Sunderdunga
Pindari Zone
Bawali
River Pindari


GMVN TRH
Yatri Niwas GMVN

Annexure III

Brief Description of Works proposed

TRH Kaleshwar

- Flooring, painting, roof treatment work, replacement of doors and windows
- Water supply and sanitary works
- Modern Sanitary fixtures in toilets
- Exterior Finish of the building
- Landscaping and signage works
- Retaining Wall
- Furnishing of rooms
- Kitchen Equipments
- Electrical and Electronic Equipments
- Internal Electrification works

TRH Gopeshwar

- Flooring, painting, roof treatment work, replacement of doors and windows
- Water supply and sanitary works
- Modern Sanitary fixtures in toilets
- Exterior Finish of the buildings
- Internal Electrification works
- Landscaping and signage works

TRH Barkot (Annexy)

- Internal Painting and Flooring
- Furnishing of rooms
- Exterior Finish of the building
- Kitchen Equipments
- Internal Electrification works
- Landscaping and signage works

TRH Hanumanchatti

- Boundary wall , Gate and Railings
- Furnishing of rooms
- Kitchen Equipments
- Landscaping and signage works

TRH Purola

- Furnishing of rooms
- Interior Finishing works of rooms
- Exterior Finish
- Retaining wall
- Kitchen Equipments
- Landscaping and signage works

TRH Adibadri

- Up gradation of dining and reception area
- Painting and flooring works
- Furnishing Works
- Kitchen Equipments
- Landscaping and signage works

Traveller's Lodge Badrinath

- Boundary wall and gate
- Furnishing Works of rooms
- Kitchen and Kitchen Equipments
- Signage works
- Internal Electrification works

Yatri Niwas(500 bedded) Badrinath

- Boundary wall and gate
- Furnishing Works of Dining and Reception area
- Kitchen and Kitchen Equipments
- Signage works
- Internal Electrification works

Maneri

- Boundary wall , Gate and Railings
- Furnishing Works
- Kitchen and Kitchen Equipments
- Internal Electrification works
- Exterior Finish

Traveller's Lodge,Barkot

- Boundary wall and gate
- Furnishing Works of rooms
- Kitchen and Kitchen Equipments
- Signage works
- Internal Electrification works

ENVIRONMENT CATEGORIZATION

A. Instructions

(i) The project team completes and submits the form to the Environment and Safeguards Division (RSES) for endorsement by RSES Director, and for approval by the Chief Compliance Officer (CCO).

(ii) The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the Sector Division submits a new form and requests for re-categorization, and endorsement by RSES Director and by the CCO. The old form is attached for reference.

(iii) In addition, the project team may propose in the comments section that the project is highly complex and sensitive (HCS), for approval by the CCO. HCS projects are a subset of category A projects that ADB deems to be highly risky or contentious or involve serious and multidimensional and generally interrelated potential social and/or environmental impacts.

• B. Project Data	
• Country/Project No./Project Title	**Loan 3055 – IND, Uttarakhand Emergency Assistance Project (UEAP)**
• Department/ Division	**Tourism Department, Government of Uttarakhand**
• Project Name	**Sub-Project: Renovation & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli**
• Processing Stage	• Sub-Project Appraisal Report (SAR) preparation
• Modality	•

[ ] Project Loan [ ] Program Loan [ ] Financial Intermediary [ ] General Corporate Finance
[ ] Sector Loan [ ] MFF [√] Emergency Assistance [ ] Grant
• [ ] Other financing modalities:

• C. Environment Category
• [√] New [ ] Re-categorization — Previous Category [ ]

• Category A	• √ Category B	• Category C	• • Category FI

D. Basis for Categorization/ Re-categorization (pls. attach documents):
[√] REA Checklist as Appendix-I
[ ] Project and/or Site Description
[ ] Other:

E. Comments

Project Team Comments: In Tourism Sector under ADB Emergency assisted UEAP, the **Renovation & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli,** also considering the future preparedness to provide emergency evacuation shelters to tourist & pilgrims the proposed project **Renovation & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli,** falls under Environmental Category "B" as its potential environmental impacts are less adverse than those of category A projects. The impacts are site specific and can be mitigate readily through EMMP.	The Project Category as per ADB Safeguard Policy (SPS) 2009 is "B" and IEE is required.

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST
Reconstruction & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected District; Chamoli & Uttarkashi, Uttarakhand

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(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/Loan 3055-IND Uttarakhand Emergency Assistance Project (UEAP): **Renovation and up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Chamoli & Uttarkashi Uttarakhand**

Sector/Division: Tourism Department, Government of Uttarakhand

Screening Questions	Yes	No	Remarks
A. Project Siting is the project area adjacent to or within any of the following environmentally sensitive areas:	√		Renovation /up-gradation work of 11 existing TRH in Chamoli and Uttarkashi Districts of Uttarakhand are proposed. Two subproject site at Badrinath lies in the buffer zone of Nanda Devi Biosphere Reserve (NDBR) whereas 9 project sites are not within or adjacent to any environmental sensitive zone.
▪ Cultural heritage site		√	
▪ Legally Protected Area (core Zone or buffer Zone)	√		Two subproject site at Badrinath lies in the buffer zone of NDBR whereas 9 project sites are not within or adjacent to any environmental sensitive zone.
▪ Wetland		NA	
▪ Mangrove		NA	
▪ Estuarine		NA	
▪ Special area for protecting biodiversity		√	
b. potential environmental impacts will the project cause.			

Screening Questions	Yes	No	Remarks
• Impairment of historical/cultural areas: disfiguration of landscape or potential loss/damage to physical cultural resources?		√	
• Disturbances to precious ecology (e.g. sensitive or protected areas)?		√	
• Alternation of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?		√	
• Deterioration of surface water quality due to silt run off and sanitary wastes from worker-based camps and chemicals used in construction?	√		Minor deterioration anticipated during the construction activities. The Environmental Management & Mitigation Plan (EMMP) provides mitigation measures to reduce the impacts. Minor works involving Renovation & Up-gradation of Additional Damaged Tourism Assets/ structures, hence no worker camps envisaged and preference will be given to local labours.
• Increased air pollution due to project construction and operation	√		During construction phase only minor amount of dust may arise which will be mitigated through water sprinkling, no other significant emission is expected as no use of heavy equipment is proposed as work involves Renovation & Up-gradation of Additional Damaged Tourism Assets structures.
• Noise and vibration due to project construction or operation?	√		Minor noise generation anticipated during the construction activities. The Environmental Management & Mitigation Plan (EMMP) provides mitigation measures to reduce the impacts.
• Disproportionate impacts on the poor, women and children, indigenous people or other vulnerable groups?		√	No such impact is anticipated.
• 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?		√	Preference will be given to local labours. Camps (if any) will be established preferably on barren land/ wasteland and away from local human settlement. Necessary medical facilities with provision of regular health check-up and awareness camp for communicable diseases will be available in the construction camp. The Contractor will link with existing national and state programs on HIV awareness

Screening Questions	Yes	No	Remarks
▪ Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	Proper disposal of liquid effluent at camps (if any) to avoid water stagnation and creation of breeding grounds. Mosquito replant and Mosquito net will be provided to worker.
▪ Social conflicts if workers from other regions or countries are hired?		√	Preference will be given to local laborers.
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Large influx of population during construction is not expected, as preference will be given to local labours.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological and radiological hazards during project construction and operation?		√	No such impact is anticipated.
▪ 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?		√	No explosive and hazardous chemicals will be use during construction phase.
▪ 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?		√	The purposed works involve Renovation & Up-gradation of Additional Damaged Tourism Assets in Disaster Affected District of Chamoli and Uttrakashi and structures are designed to ensure safety of the community in case of natural calamity or accidental causes.
▪ Generation of solid waste and/or hazardous waste?	√		Waste disposal shall be done in legitimate manner and will not cause water pollution and if any hazardous waste will be produced it will be handed over to authorized vendor.
▪ Use of chemicals?		√	
▪ Generation of wastewater during construction or operation?	√		Construction activities involve Renovation & Up-gradation of Additional Damaged Tourism Assets which does not involve much water usage. During operation provisions for waste water management shall be ensured in EMMP.

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)?		√	The sub-project zone is entirely located on hilly terrain. Therefore, no chances of floods, tsunami or volcanic eruptions. There is a possibility of landslides during rainy season and earthquakes prone zone. However, project activities are not expected to increase any of the extreme natural activities.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		√	No abrupt changes are expected in the project lifespan.
▪ 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)?		√	Not likely to be. Good tourism infrastructure assets in districts boost the economy of the region and will help to decrease migration of local people.
▪ 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)?		√	No such impacts anticipated.

F. Recommended for Approval		
Prepared by: Environment Expert PIU (Tourism) (Dr. Mahadev Somula, Env. Safeguard Expert)		**Sign. of Support Assistant Engineer, Field, PIU (Tourism)** Rajat (Rajat Rajput)
Date: 04/8/2016		**Date:** 04/08/2016
(SANJAY GUPTA)		(Dr Nutan Gupta)
(Sign. of Procurement Specialist , PIU (Tourism)		**Reviewed by: Environment Officer PIU**
Date: 04/08/2016		Date: 04/08/2016
(GAMBHIR SINGH) Gambhir Singh Dy. Program Manager PIU-Tourism (Garhwal), UJAF 74/1-Raipur Road, Dehradun		(Dr. Nutan Gupta)
(Sign. of Deputy Program Manager Tourism		**Verified: Environment Officer, PMU**
Date 04/08/2016		Date: 04/08/2016

Endorsed by: Program Manager, IA, Tourism

Program Manager
PIU Tourism (Garhwal)-GMVN

Sensitive or protected areas)?

Appendix -3 Public Consultation Record

Public Consultation Record

Name of Project : Uttarakhand Emergency Assistance Project (UEAP): Renovation and Up-gradation of Additional Dhanaulti Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli Uttarakhand.

Project Number : 3055-IND

Place of public Consultation : Kaleshwar

Tehsil : Karan Prayag

District : Chamoli

Date : 14/05/2016

List of Stakeholders/Participant in Public Consultation (PCM)

S. No	Name	Address	Occupation	Signature
1	Girish ~~Bisht~~ Vashist	Manager GMVN, Kaleshwar 7060211126	Service	
2	Pushkar Singh Kunthari	Room Boy GMVN	Service	
3	Vijay Purohit	Housing (Room Boy) GMVN	Service	
4	[illegible] Kaleshwar	Kaleshwar (Local Residence)	Agriculture / Local Residence	
5	Nandlal Pallavi	Kaleshwar (Local Residence)	Agriculture	
6	Rahul Dev	Kaleshwar	Student	
7	[illegible]	वार्ड [illegible] कालेश्वर (कर्णप्रयाग)	[illegible]	
8	[illegible] प्रसाद			
9	सुनील	ग्राम - कालेश्वर, पो० [illegible] चमोली	[illegible]	
10	[illegible] सिंह [illegible]	कालेश्वर [illegible]		
11	[illegible]	[illegible]	[illegible]	
12	[illegible]	ग्राम - प्रधान [illegible]		
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Conducted by: 1. Dr. Mahadev Somvanshi

2. Rajat Rajput

Public Consultation Record

Name of Project : Uttarakhand Emergency Assistance Project (UEAP): Renovation and Upgradation of Additional Damaged Tourism Assets in Disaster Affect Districts Uttarkashi & Chamoli Uttarakhand.

Project Number : 3055-IND

Place of public Consultation: Gopeshwar, Dist. Chamoli, Uttarakhand

Tehsil : Chamoli

District : Chamoli

Date : 14/05/2016

List of Stakeholders/Participant in Public Consultation (PCM)

S. No	Name	Address	Occupation	Signature
1	Chandan Kandari	Manager G.M.V.N. Gopeshwar 9560066658	Service	[signature]
2	Smt Malmati Devi	Parichariká	-do-	[signature]
3	Sri Ramesh Purohit	Room boy	-do-	[signature]
4	Dayal Singh	Cook	-do-	[signature]
5	Munna Singh	Sweeper	-do-	[signature]
6	Brijmohan Kotiyal	Water	-do-	[signature]
7	Harish Singh Negi	Water	-do-	[signature]
8	S. Spal Singh Negi	Gopeshwar	Farmer	[signature]
9	Subodh Kumar	Gopeshwar	Shopkeeper	[signature]
10	Shanti prasad Nauty	Gopeshwar	"	[signature]
11	Kamal Saini	Gopeshwar	"	Kamal
12	Baleesh Singh	Gopeshwar	Local Resident	[signature]
13	Avtar Singh Rawat	Gopeshwar	"	[signature]
14	Rahul Maikhuri	Gopeshwar		[signature]
15	Ved Prakash	Gopeshwar		[signature]
16	Deval Nawani	Gopeshwar	"	[signature]
17	Narain Singh Rawat	"	"	[signature]
18	Bhupal Rawat	"	"	[signature]
19	Sanjay Nawani	"	"	[signature]
20	Manorma	"	"	[signature]
21				
22				

Conducted by: 1. Dr. Mahadev Semwal

2

Public Consultation Record

Name of Project : Uttarakhand Emergency Assistance Project (UEAP): Renovation and Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkash. & Chamoli Uttarakhand.

Project Number: 3055-IND

Place of public Consultation: Adi Badri

Tehsil : Adi Badri

District : Chamoli

Date : 14/05/2016

List of Stakeholders/Participant in Public Consultation (PCM)

S. No	Name	Address	Occupation	Signature
1	Arvind Benjwal	Manager G.M.V.N. Adibadri 7060410504	Service	
2	Shankar Singh Panwal	Room Boy GMVN	Service	
3	Kalam Singh Negi	Room Boy GMVN	Service	
4	Arvind Sukula	Waiter G.M.V.N.	Service	
5	Ram Bahadur	Kashkar	Kashkar	3 year
6	Kamal Kabhi	Hotelier Private Cook	Service	
7	Kranti Bhatt	S.O.G.	Service	
8	[illegible]	[illegible]	[illegible]	
9	[illegible]	[illegible]	[illegible]	
10	[illegible]	[illegible]	-	
11	Sandeep Shah	Adibadri	Shopkeeper	
12	Vijayen [illegible]	Adibadri	Advocate	
13	[illegible]	[illegible]	[illegible]	
14	Naveen	Nagli	Private	
15	Nanda Singh	Bhalsaun	Agri	
16	[illegible]	Tulgarh Adibadri	Shopkeeper	
17	[illegible]	[illegible]	[illegible]	
18	[illegible]	[illegible]	[illegible]	
19	[illegible]	[illegible]	[illegible]	
20	[illegible]	[illegible]	[illegible]	
22	[illegible]	[illegible]	[illegible]	
23				

Conducted by: 1. Dr. Mahadev Semwal

2. Rajat Rajpal

Public Consultation Record

Name of Project : Uttarakhand Emergency Assistance Project (UEAP): Renovation and Up-gradation of Additional Damaged Tourism Assets in Disaster Affected Districts Uttarkashi & Chamoli Uttarakhand.

Project Number: : 2055-IND

Place of public Consultation: Badrinath

Tehsil : Joshimath

District : Chamoli

Date : 12-05-2016

List of Stakeholders/Participant in Public Consultation (PCM)

S. No	Name	Address	Occupation	Signature
1	पान सिंह बिष्ट	GMVN	Manager	
2	भगवत सिंह पंवार	GMVN	चौकीदार	
3	कमल किशोर डिमरी	GMVN	स्वागती	
4	दान सिंह भंडारी	GMVN	स्वागती	
5	[illegible]	GMVN	स्वागती	
6	[illegible]	GMVN	[illegible]	
7	[illegible]	GMVN	स्वागती	
8	[illegible]	Badrinath	[illegible]	
9	[illegible]	Badrinath	दुकानदार	
10	L. Dalma	Badrinath	दुकानदार	
11	[illegible]	GMVN	[illegible]	
12	[illegible]	GMVN	स्वागती	
13	[illegible]	GMVN	[illegible]	
14	[illegible]	[illegible]	[illegible]	
15	[illegible]	[illegible]	[illegible]	
16	[illegible]	[illegible]	[illegible]	
17	[illegible]	[illegible]	[illegible]	
18	[illegible]	बद्रीनाथ	पंचायत	
19	[illegible]	बद्रीनाथ	[illegible]	
20	[illegible]	बद्रीनाथ	पंचायत	
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Conducted by: 1. Mahadev Semwal

2. Rajat Rajput

Public Consultation Record

Name of Project	:- Uttarakhand Emergency Assistance Project (UEAP) Renovation and up- gradation of Damaged Tourism assets in Disaster Affected Uttarkashi & Chamoli Uttarakhand.
Project Number	:- UK/UEAP-T(GMVN)/DDN/03/Lot 04/04/15
Place of Public Consultation	:- TRH Hanuman Chati / Syanachatti
Tehsil	:- Barkot
District	:- Uttarkashi
Date	:- 18/05/2016

List of Stakeholders /participant in Public Consultation(PCM)

S.NO.	NAME	ADDRESS	OCCUPATION	SIGNATURE
1.	Rameshwar Bhatt	Ukhu	Fabrication	[illegible]
2	Anil Kumar	Muzaffarnagar	Agriculture	[illegible]
3.	Ameer Azam	" "	"	[illegible]
4.	Mohd. Aakib	"	"	Mohd. Aakib
5.	[illegible]	Jansath (M.nagar)	—	[illegible]
6.	Aadam	Jansath (" ")	"	[illegible]
7.	Mohd. Salman	Morna (M.nagar)	"	[illegible]
8.	Anoop Kumar	Vill- Kathra M. Ngr	"	[illegible]
9.	Gulab Singh	Tiyara [illegible]	[illegible]	[illegible]
10.	Brij Mohan Rawat	Barkot (Uttarkashi)	T. G. [illegible]	[illegible]
11.	Manish Khandwi	Uttarkashi	Teacher	
12.	Vishesh Kumar	"	Teacher	
13.	Vineet Rajput	"	Teacher	
14.	Dinesh Rawat	"	Teacher	
15.	Pankaj Semwal	"	Army	
16.	Rahul Sharma	"	S.BCA	
17.	Manoj Rana	"	Farmer	
18.	Tarun Chauhan	"	Trading	
19.	Pradeep Singh	"	"	
20.	Mohit Kumar	"	"	
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Conducted by

J.E. PIU - GMVN

Barkot (DH)

Public Consultation Record

Name of Project :- Uttarakhand Emergency Assistance Project (UEAP)
Renovation and up- gradation of Damaged Tourism
assets in Disaster Affected Uttarkashi & Chamoli Uttarakhand.

Project Number :- 01(/DEAP-T(GMVN)/DDN/09/ 2014/101

Place of Public Consultation :- Purola (Uttarkashi)

Tehsil :- Purola

District :- Uttarkashi

Date :- 17/05/2016

List of Stakeholders /participant in Public Consultation(PCM)

S.NO.	NAME	ADDRESS	OCCUPATION	SIGNATURE
1.	Sundeela	Karna	Housewife	Sundeela
2.	Kavita	Bhutamy	Anshmiof	Kavita
3.	Sanjay	Kumola Road	Businessman	[illegible]
4.	Karishma	Mori	Teacher	Karishma
5.	Poonam Negi	Koona	Teacher	[illegible]
6	Anil Kumar	Mori	Police	[illegible]
7.	Arvind	Kharkya sem.	Teacher	[illegible]
8.	Surider	Khankaysom	teacher	[illegible]
9.	Kanchan Rawat	Kumola	Teacher	Kanchan
10.	Monika Negi	Koona	Teacher	[illegible]
11.	[illegible] Negi	Poorgnal	Police	[illegible]
12.	[illegible]	KARADA	[illegible]	[illegible]
13.	[illegible]	[illegible]		[illegible]
14.	[illegible]	Barealpa		[illegible]
15.	[illegible]	Purola		
16.	Braj Mohan Awasthi	P.G. Barkot Uttarkashi	——	[illegible]
17.	Anuj Singh	Purola	farmer	[illegible]
18.	[illegible] Singh Rawat	Purola	Farmer	[illegible]
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[illegible]
Conducted by
J.E. PLU GMVN
Barkot (Uttarkashi)

Public Consultation Record

Name of Project :- Uttarakhand Emergency Assistance Project (UEAP)
Renovation and up- gradation of Damaged Tourism
assets in Disaster Affected Uttarkashi & Chamoli Uttarakhand.

Project Number :- UK/UEAP-T (GMVN) / DDN/09/ 2014-09/02/03

Place of Public Consultation :- Barkot {T.L/TRH Annexe}

Tehsil :- Barkot

District :- Uttarkashi

Date :- 21/05/2016

List of Stakeholders /participant in Public Consultation(PCM)

S.NO.	NAME	ADDRESS	OCCUPATION	SIGNATURE
1.	R.D. Bhaddani	Barkot (Uttarkashi)	Manager GMVN	[illegible]
2.	Rajendra Singh	Barkot (Uttarkashi)	[illegible]	[illegible]
3.	Khajan Singh	Barkot (Uttarkashi)	Chowkidar	[illegible]
4.	Mahaveer Singh	" "	Room boy GMVN	[illegible]
5.	Ravindra Singh	" "	GMVN	[illegible]
6.	Kishan Singh	" "	GMVN	[illegible]
7.	Dharamber Singh	" "	GMVN	
8.	Kailash Singh	" "	GMVN	
9.	Pawan Singh	" "	Farmer	[illegible]
10.	Girish chand	" "	GMVN	[illegible]
11.	Dheer Pal	" "	GMVN	[illegible]
12.	Rajendra Singh	" "	GMVN	[illegible]
13.	Ashish Rawat	" "	Business	Ashish
14.	Nikhil Joshi	" "	Army	Nikhil
15.	Mohan Pant	" "	Police	mohan
16.	Sandeep Lal	" "	Police	Sandeep
17.	Ritu Joshi	" "	Doctor	Rita
18.	Tina Thapliyal	" "	"	Tina
19.	Ravi Nautiyal	" "	Hotel	Ravi
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[illegible]
Conducted by
J.E. P.W GMVN
Barkot (W)

Public Consultation Record

Name of Project :- Uttarakhand Emergency Assistance Project (UEAP)
Renovation and up gradation of Damaged Tourism assets in Disaster Affected Uttarkashi & Chamoli Uttarakhand.

Project Number :- UK/UEAP-T(GMVN)/DDN/09/Lot 09/06

Place of Public Consultation :- TRH Maneri

Tehsil :- Uttarkashi

District :- Uttarkashi

Date :- 22/05/2016

List of Stakeholders /participants in Public Consultation(PCM)

S.NO.	NAME	ADDRESS	OCCUPATION	SIGNATURE
1	Ramesh Singh	Uttarkashi	Business.	
2.	Sunil Rawat	do	Student	
3.	Bhupendra Singh	Main Market Uttarkashi	Business	
4.	Manish Negi	Gangotri, Uttarkashi	Student	
5.	Brijmohan Bhiyal	Maneri, Uttarkashi	Govt. Job.	
6.	Prakash Rawat	do	Business.	
7.	Ashish Semwal	Pali, Uttarkashi	Student	
8.	Harish Singh	do	Pvt. Job.	
9.	Pushkar Singh	do	Pvt. Job.	
10.	Bhagwati Prasad	Sangla, Uttarkashi	Govt. Job	
11.	Vishal kumar	Bantoli Uttarkashi	Police Service	
12.	Rahul Sharma.	Sangla, Uttarkashi	Shopkeeper	
13.	Pawan Negi	Maneri Uttarkashi	Retirement	
14.	Mahendra Singh	Maneri, Uttarkashi	Farmer.	
15	Ashish kumar	Gangotri, Uttarkashi	Student	
16	Shankar Negi	Main Market Uttarkashi	Student	
17	Kapil Kumar	Main Market Uttarkashi	Business	
18.	Sanjay Thapliyal.	Main market, Uttarkashi	Govt. Job	
19.	Shailendra Rawal	Main Market Uttarkashi	Pvt. Job.	
20.	Ambika Semwal.	Sangla, Uttarkashi	Shopkeeper	
21.	Harshmani Bhandari	Gathan, Uttarkashi	Farmer	
22.				
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24.				
25.				

Conducted by
J.E. PIU-GMVN
Bashat [illegible]