Initial Environment Examination

Project Number: 47229-001
July 2016

IND: Uttarakhand Emergency Assistance Project (UEAP)

Package: Construction of FRP huts in disaster affected district of Kumaon (District Pithorgarh) Uttarakhand

Submitted by

Project implementation Unit –UEAP, Tourism (Kumaon), Nainital

Asian Development Bank

for logging pls
GM/AS.

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Letter No: 171 /PIU/UEAP(T)/KMVN/2016 Dated : 28 June,2016

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To,
Ms. M Teresa Kho
Country Director, INRM, ADB
4, San Matrin Marg,
Chankyapuri
New Delhi 110021, India

Subject: - ADB Loan no. 3055-IND Submission of IEE for construction of FRP Huts in District Pithoragarh of Uttarakhand for tourism (KMVN) under UEAP

Dear Madam,

Please find enclosed the submission of "Initial Environmental Examination Report" (IEE) for construction of FRP Huts at "Sirkha & Tola" of District Pithoragarh of Uttarakhand under tourism of Uttarakhand Emergency Assistance Project for your kind persual & approval.

(Dhiraj S. Garbyal)
Program Manager
PIU,UEAP(T)KMVN

CC: Program Director, UEAP, Sidcul Building, 29, IIE (IT Park), Shahastradhara Road, Dehradun.

(Program Manager)
PIU,UEAP(T)KMVN

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ADB

Project Number: 3055-IND June 2016

IND: Uttarakhand Emergency Assistance Project

Submitted by

Project implementation Unit, UEAP, Kumaon Mandal Vikas Nigam limited, Nainital

Asian Development Bank

Initial Environmental Examination

June 2016

INDIA: **CONSTRUCTION OF FRP HUTS IN DISASTER AFFECTED DISTRICT OF KUMAON (DISTRICT PITHORGARH) 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.

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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
m3	Cubic meter
NAAQM	National Ambient Air Quality Monitoring
NOx	oxides of Nitrogen
NA	Not Applicable
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**
µg/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 Sarju. 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 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 tourism 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.. 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, construction of Fibre Reinforced Plastic (FRP) huts are proposed in disaster affected district Pithoragarh of Kumaon region 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 no protected or sensitive

   areas were traversed. 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 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. Neither the project component has direct intervention not indirect intervention with sensitive ecosystem.
10. **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.

11. **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.
12. **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.
13. **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 commencement of work sampling for these parameters be conducted.

I. Introduction

A. Project Background/Rationale

14. 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 Sarju. 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)

15. 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 (lA) 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 (UJL) for urban water supply, or any successor hereto.

C. Purpose of the Environmental Assessment

16. 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

17. IEE was conducted based on preliminary Detailed Design Report (DPR). The IEE covers all activities proposed under the project. The core zone 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.

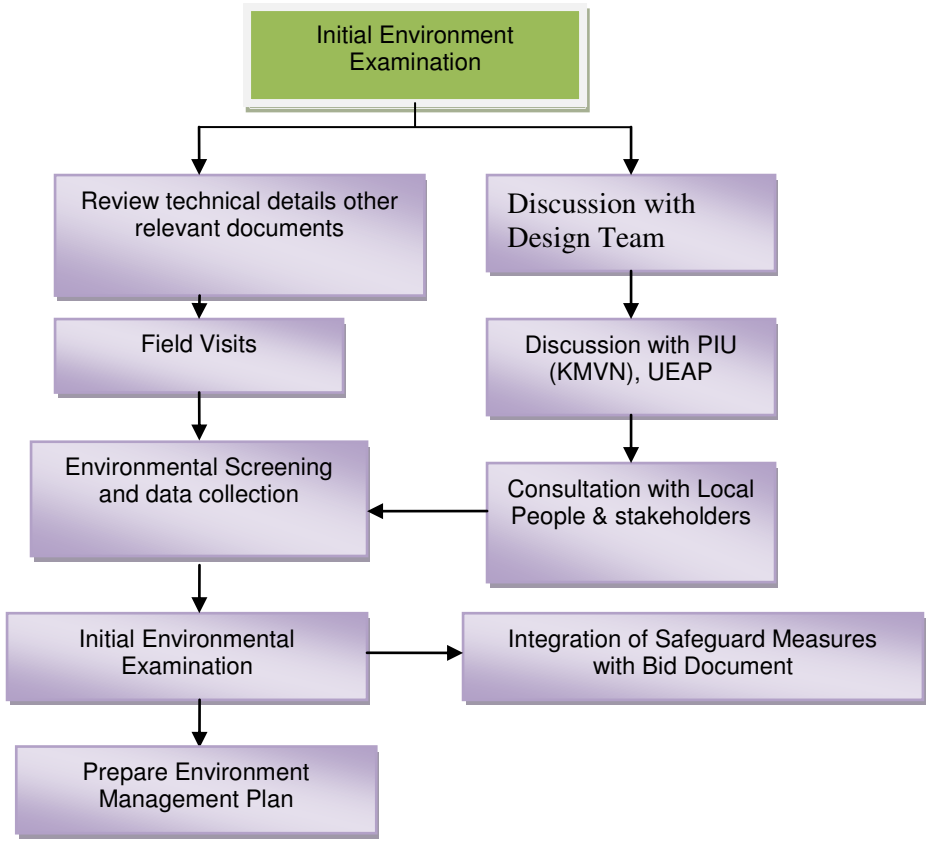
E. IEE Content

18. 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

19. 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

20. Extensive consultations were held with all stake holders that include: 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

21. 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		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, KMVN	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.		No	No	No Required
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, KMVN Not required	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 - Dehradun	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	/	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	Uttarakhand Environmental Protection and Pollution Control Board - Dehradun	No	Contractor	No Required
4.	Authorization for Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989 as amended 2003	Uttarakhand Environmental Protection and Pollution Control Board - Dehradun	No	Contractor	Not Required
5	Consent for Disposal of Sewage from Labour camps	Water (Prevention and Control of Pollution) Act 1974	Uttarakhand Environmental Protection and Pollution Control Board - Dehradun	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	Uttarakhand Environment Protection and Pollution Control Board - Dehradun	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	.Civil Work Contractor	Not Required
11..	License for Storing Diesel and other explosive.	Petroleum Rules, 2002. Hazardous Waste (Management and Handling) Rules 1989.	Commissioner of Explosives	No	Contractor	Not Required
12.	License for Storing Diesel and other	Petroleum Rules, 2002. Hazardous Waste (Management and Handling) Rules 1989.	Commissioner of Explosives	No	Contractor	Not Required
	C. Implementation Stage					
.						
13	Consent to Establish & Consent to Operate	The Air (Prev. & Con. of Pollution) Act, 1980, Water Preventation and Control of Pollution) act 1974.	Uttarakhand Environment Protection and Pollution Control Board - Dehradun	YES	KMVN	

Table: III -1 DESCRIPTION OF THE PROJECT

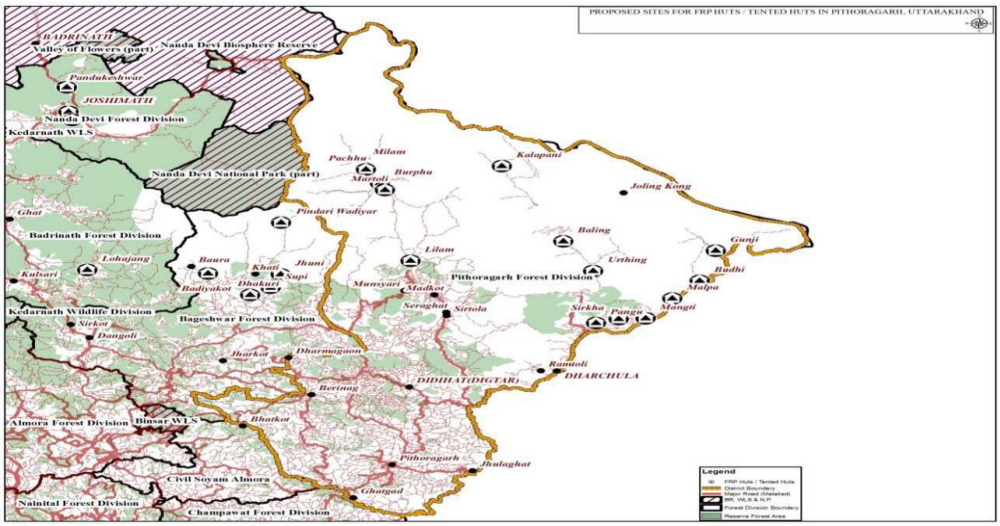
A. Project Location

The district of Pithoragarh came into being in 1960 when it was carved out of the district of Almora. On 15th September 1997, the Champawat Tehsil, hitherto under Pithoragarh, was carved into Champawat district. The Pithoragarh town is located at a height of 1645 meters above sea level. The district lies between 29.4° to 30.3° North latitude and 80° to 81° East longitude along the eastern and southern part of the central Himalayas with Indo-Tibetan watershed divide in the north and the Kali River forming a continuous border with Nepal in the east.

District Pithoragarh of Uttrakhand State having provision of 11 FRP huts at 2 locations viz. Sirkha & Tola. Both sites belongs to private land which are donated by local people , Daan Nama (Donation) and other norms properly followed for acquiring the proposed land.

Table: III-A: Project Location

S.No.	Location	No. of Huts	**Proposed Facilities**
1	Sirkha	6	Construction of FRP huts to provide improved/ better Facilities to Tourist.
2	Tola	5	Construction of FRP huts to provide improved/ better Facilities to Tourist



Map of District Pithoragarh showing project site

B. Proposed Category of the Project

22. Pursuant to the requirements of the ADB Safeguard Policy Statement (2009) proposed renovation and up gradation of tourism infrastructure in District Pithoragarh 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 KMVN Consistent with the Environmental Assessment and Review Framework, the subproject was screened using the ADB rapid environmental assessment (REA) checklist- General (Tourism).

23. The environmental screening revealed that no protected or sensitive areas were traversed. 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. Various locations suffered heavy damages due to flash flood incessant rain and landslides.

25. The Kumaon region has exciting trekking region viz the Kailash Mansarovar Yatra, Chota Kailash route. During these treks one can understand the social and cultural life of the people living in the Chaudans, Byans and Darma valleys.

The locations for FRP huts/ tented accommodation have been identified in these areas because the effect of climatic mishaps in this part of Uttarakhand is maximum, and also some of the most frequented tourist destinations for adventure and pilgrim are situated here. This area includes pilgrim destinations of entire "Char Dham Circuit", namely Badrinath in Chamoli, Kedarnath in Rudraprayag, Gangotri & Yamunotri in Uttarkashi district. Thus five districts of the State have been identified as project area (three districts in Garhwal and two in Kumaon)

D. Sub project Description

a. Sirkha

26. Sirkha is a Village in Kailash Mansarovar route in Pithoragarh District of Uttarakhand State, India.

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Town/village name	**Sirkha**
District	Pithoragarh
Tehsil	Dharchula
No. of households	80
Total Population	310
No. of FRP	06
Area	0.057ha

Approach: It is located 135 KM by bus/Jeep from District HQ Pithoragarh plus 06 km by trek.

b. Tola

27. Tola is small village located in Munsiari Tehsil of Pithoragarh district, Uttarakhand with total 23 families residing.

Town/village name	Tola
District	Pithoragarh
Tehsil	Munshiyari
No. of households	23
Total Population	250
No. of FRP	05
Area	0.12ha

E. Project Implementation Schedule

28. The implementation period for the UEAP is around 2 years with a construction period of around 1 year. All UEAP components are expected to be completed by February 2017.

TECHNICAL FEATURES:

A) Seismic resistant structure:

29. 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 ceiling design colour schemes of the entire room's courtesy different finishes available acrylic paints 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.

30. • Testing standards:

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

IV DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

31. This section presents a brief description of the existing environment, including its physical, ecological resources, and socio-economic development of Sub project of Pithoragarh. 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 constriction of FRP huts in Pithoragarh district . 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

32. **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.

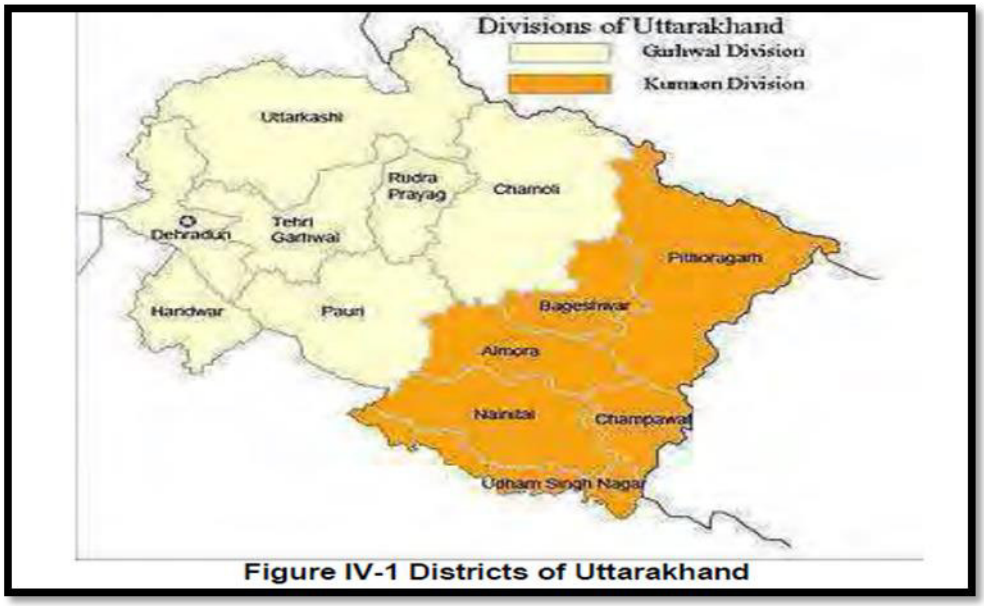


Figure IV-1 Districts of Uttarakhand

33. 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 Tibetan mountains, and Pindari and Kaliganga which ultimately joins Alaknanda River. The Garwhal division is composed of Chamoli, Uttarkashi, Rudraprayag, Tehri Garhwal, Pauri, Dehradun, and Haridwar districts.and is entirely on rugged mountain ranges dissected by valley, and deep gorges. The Alaknanda River, the main source of the Ganges, traces its headwaters in this region.

34. 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 Pithoragarh

35. All the project site lies within district pithoragarh which is eastern-most district in the state of Uttarakhand. It is naturally landscaped with high Himalayan mountains, snow capped peak, passes valleys, alpine meadows, forests waterfalls, perennial rivers, glaciers and spring. The flora and fauna of the area have rich ecological diversity.

36. The geographical area of the district is 7,110 km^2 (2,750 sq mi). At the 2011 census, the total population of the district was 485,993. The total literacy rate was 82.93 percent. Pithoragarh town, which is located in Saur Valley , is its headquarters. The district is within the Kumaon division of Uttarakhand state. The Tibet plateau is situated to the north and Nepal is to the east. The Kali River originates from Kalapaani and flows south, forming the eastern border with Nepal. The Hindu pilgrimage route for Mount Kailash-Lake Manasarovar passes through this district via Lipulekh Pass in the greater Himalayas. The district is administratively divided into

five tehsils: Munsiyari; Dharchula; Didihat; Gangolihat; and Pithoragarh.Naini Saini Airport is the nearest civil airport, but it does not have regular scheduled commercial passenger service. The mineral deposits present in the district are magnesium ore, copper ore, limestone, and slate.

37. Pithoragarh town, being in a valley, is relatively warm during summer and cool during winter. During the coldest months of December and January, the tropical and temperatemountain ridges and high locations receive snowfall and have an average temperature of 5.5–8.0 °C (41.9–46.4 °F). Pithoragarh district has extreme variation in temperature due to the large variations in altitude. The temperature rises from mid-March through mid-June. The areas above 3,500 metres (11,500 ft) remain in a permanent snow cover. Regions lying at 3,000–3,500 metres (9,800–11,500 ft) become snowbound for four to six months. At places like the river gorges at Dharchula, Jhulaghat, Ghat and Sera, temperatures reach 40 °C (104 °F). The annual average rainfall is 36.7 centimetres. After June the district receives monsoon showers. Winter is a time for transhumance – the seasonal migration of the Bhotiya tribe with their herds of livestock to lower, warmer areas.

38. According to the 2011 census Pithoragarh district has a population of 485,993, roughly equal to the nation of Suriname. This gives it a ranking of 546th among the 640 Districts of India. The district has a population density of 69 inhabitants per square kilometre (180/sq mi) . Its population growth rate over the decade 2001–2011 was 5.13%. Pithoragarh has a sex ratio of 1021 females for every 1000 males, and a literacy rate of 82.93%.[2]

Native tribes in the district include the Van Rawats and Bhotiya (an exonym). Van Rawats are hunter-gatherers. Bhotiyas are traders. In Pithoragarh, the Bhotiya are divided into two main tribes – Johari Shauka and Rung. The Johari Shauka community inhabits the areas in Munsiyari while Rung tribe are spread among the three valleys of Darma, Chaundas, and Byans. Kandali Festival, celebrated once every 12 years by inhabitants of Chaundas Valley, is one of the major festivals in this area.

ii. Geology

39. The district lies in the Himalayas which are the youngest mountains in the world and the land mass now covered by them was occupied by the great geosynclinal Tethys sea during the Mesozoic period. The probable date of commencement of the elevation of the Himalayas is about the close of the Mesozoic period. According to geological formations of the district, it may be divided into four broad belts, viz., (1) the innermost Siwalik hill ranges, (2) the lesser and middle Himalayas, (3) the inner Himalayas and (4) the thin belt bordering the Tibetan Himalayas, roughly tending east-south-east.

40. The belt of the innermost hill ranges of the Siwalik group lies in the southern part of the district. In the rock formations here sandstones alternate with clayey shales. The sandstones are dirty, friable and micaceous and are, therefore, unsuitable for the building, ballast and industry.

41. The second belt, comprising the ranges of the lesser and middle Himalayas, extend north of the Siwalik group to Dharchula. It contains sedimentary and low to medium grade metamorphic rocks such as

limestone, slate, quartzite, phyllite and mica-garnet schist. Mineralization of copper, magnesite, soap-stone, etc., is known to occur in this belt.

42. The third belt, containing higher ranges of the inner Himalayas, is wholly composed of crystalline metamorphic rocks such as mica and garnet schists, kyanite and sillimanite schists, gneisses, granulites and quartzites. This belt is very little known geologically. The belt extends from near Dharchula to Garbyang.

43. The fourth belt, bordering the Tibetan Himalayas has an average width of about 7 km. It contains marine sedimentary rocks such as quartzites, fossiliferous limestones and shale.

iii. Physiography

44. 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. as well as frequent earthquake of varying intensity give region to believe that the region is still unstable.

iv. Pedology

45. The soils are natural, dynamic, heterogeneous, non-renewable resource, which support plant and animal life. The tract of Pithoragarh 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 Pithoragarh district as follows:

46. Alpine zone soil: These soils are mostly granite and sandy loam in nature. The pH ranges from 5.5 to 6.5. The elevation varies from 3000m –4000m. ii) Cool Temperate and Sub-Tropical Zone soil: These soils are mostly gravely and at few places sandy loam is also found. The elevation ranges from 800m – 3000m. iii) Mid-hill zone soil: Soils are mostly sandy loam, but have enough slopes and are warm 1200 m to 1800 m iv) Lower valley zone soil: Soils of this zone are quite deep and fertile. These soils are suitable for agriculture.

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

The proposed locations of soil 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.	Construction of FRP huts at Sirkha District Pithoragarh Uttarakhand	01	Construction Site Sirkha,
2.	Construction of FRP huts at Tola, District Pithoragarh Uttarakhand	01	Construction Site Tola

During construction the sampling locations proposed are, where the construction/ restoration/ repair work will be done.

C. Climate and Meterology

47. Uttarakhand, with its highly varying topographical features, has shown an equally variegating climatic condition, ranging from hot and sub-humid tropical in the southern tract of Bhabhar to 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 ridges and 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 as the distribution of rainfall. However, the overall climatic condition in the State is governed by the southwest monsoon. It has a sub-tropical to temperate climate, with three pronounced seasons; summer, winter, and monsoon. The hilly terrain of the Himalayan region has snow cover and is severely cold during winter with snowfall normally occurring during the months of December to March. The climatic conditions of Almora, Nainital, Pithoragarh, Chamoli, Uttarkashi, Pauri and Dehradun are humid and cold.

48. The valley regions of the district are hot and humid during summer, while the hilly regions experience temperatures below zero degree during winter. The northern part of the district remains covered with snow for four to five months. The area experiences a mean annual rainfall of 1117.8 mm (2006). The agro-climatic zone in the district is located in the lower Himalayan Zone. The altitude of the district ranges from 600-4800 m. On the basis of altitude the district is sub divided into the following six regions: i) Cold Tropical- sub tropical region: 600-1200 m ii) Warm Temperate region: 1200-1800 m iii) Cool Temperate region: 1800-2400 m. iv) The Cold region: 2400-3000 m. v) Alpine region: 3000-4000 m. vi) Glacier region: 4000-4800 m.

D. Ambient Air Quality and Noise Level

49. 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.

50. 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.	Construction of FRP huts at Sirkha District Pithoragarh Uttarakhand	01	Construction Site Sirkha,
2.	Construction of FRP huts at Tola, District Pithoragarh Uttarakhand	01	Construction Site Tola

During construction the sampling will be conducted where the FRP construction work will be done.

Ambient Noise Level

51. 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 construction 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 Pithoragarh.

52. 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 air quality 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.

53. 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.	Construction of FRP huts at Sirkha District Pithoragarh Uttarakhand	01	Construction Site Sirkha,

2.	Construction of FRP huts at Tola, District Pithoragarh Uttarakhand	01	Construction Site Tola

E. Hydrology

54. 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**

55. The region of Uttarakhand is well drained by numerous rivers and rivulets locally known as 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 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

56. Very little documentation on the pollution status of rivers except that of the holy river Ganga and some other water bodies where there were at least limited monitoring studies recently. 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.

57. 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.	Construction of FRP huts at Sirkha District Pithoragarh Uttarakhand	01	Construction Site Sirkha,
2.	Construction of FRP huts at Tola, District Pithoragarh Uttarakhand	01	Construction Site Tola

During construction the sampling will be conducted where the construction work will be done and near any sensitive receptor.

F. MINERAL RESOURCES

58. 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.	Greyphite	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.

Magnestic - 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 as lenticular body and is associated with mineral pyrites, which adds a color to it, and in places 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 but are of hardly any economic important. Iron ore, rich in haematite, and magnetic ore, with 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

59. . 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.

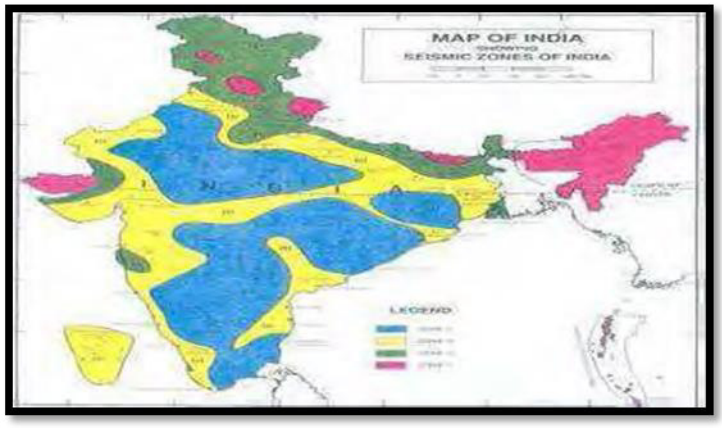


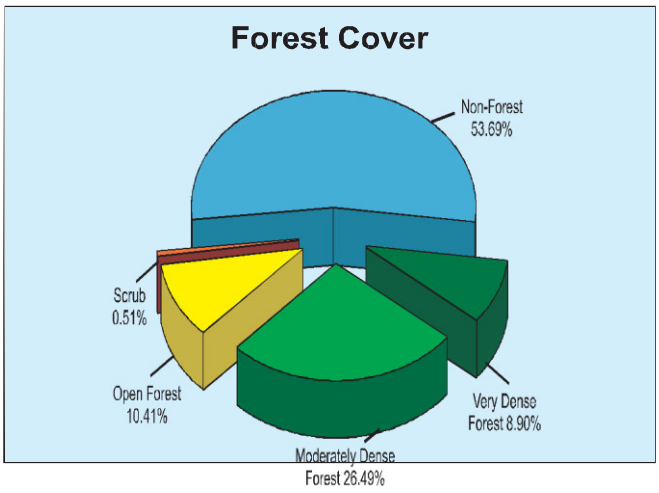
Figure IV-2 Seismic Zone of India

65. Seismically, 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 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

66. According to The India State of Forest report 2013, the recorded forest area of the Uttarakhand state is 24,508 km2 which constitutes 45.82% of its geographical area. Very-dense forest constitute 8.95%, moderately dense constitutes 26.38%, Open Forest constitutes 10.49% and scrub constitutes 0.49% of total forest area.



66. The distribution of forest cover by district is presented in the succeeding Figure and Table. The Garhwal region has more forest cover with 14,626 km compared to the Kumaon region with 9,869 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.

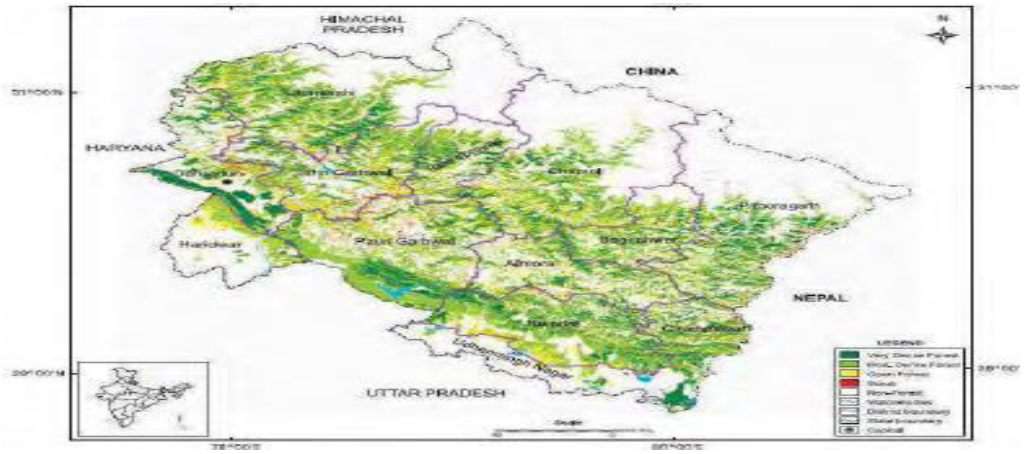


Figure IVV-4 Uttarakhand's Forest Cover Map

Table IV-3 District-wise Forest Cover, Uttarakhand

Region	District	Geographic Area	Forest Cover			Total Forest 2013	% of Total 2013
			Very Dense	Moderate Dense	Open Forest		
Garhwal	Uttarkashi	8,016	570	1957	618	3,145	39.23
	Rudraprayag	1,984	241	592	297	1,130	56.96
	Chamoli	8,030	441	1,573	686	2,700	33.62
	Pauri Garhwal	5,329	520	2,095	676	3,291	61.76
	Tehri Garhwal	3,642	298	1,232	618	2,148	58.98
	Dehradun	3,088	583	695	332	1,610	52.14
	Haridwar	2,360	25	333	257	615	26.06
Sub-Total		32,449	2678	8477	3,484	14,639	45.11
Kumaon	Pithoragarh	7,090	571	1,113	416	2,100	29.62
	Bageshwar	2,246	197	883	305	1,385	61.67
	Almora	3,139	222	927	428	1,577	50.24
	Nainital	4,251	605	1,899	570	3,074	72.31
	Champawat	1,766	337	576	274	1,187	67.21
	Udham Singh Nagar	2,542	175	236	135	546	21.48
Sub-Total		21,034	2,107	5,634	2,128	9,869	46.91
Total		53,483	4,785	14,111	5,612	24,508	45.82
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, 2011

67. 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.

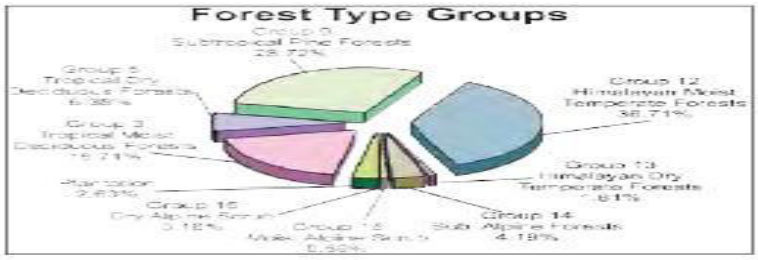


Figure IV-5. Forest type groups of Uttarakhand

68. 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

S.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

69. 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

70. 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.

71. 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

72. 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	*Sapijdus 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 antidysentricr*
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 muticr*
5.	Dev ringal	*Thamnocalamus faclouri*
6.	Jhugra ringal	*Arundinaria jaunsarensis*

Table IV-9 List of Major Fauna

Sl. No.		Wild Animals
	Local Name	**Scientific Name**
1	Guldar	*Panthera Pardus*
2	Kala Bhalu	*Selenarctos thibetanus*
3	Ghural	*Memorhaedus goral*
4	Kakar	*Muntiacus muntjak*
5	Khirao	*Capricornis sumatraensis*
6	Jangli Suar	*Sus-scrofa cristatus*
7	Chitrola	*Martes flarigula*
8	Langoor	*Presbyits entellus*
9	Khargosh	*Lepus nigricollis*
10	Sehi	*Hystrix indica*
11	Gidar	*Canis aureus indicus*
12	Jangli Billi	*Felis chaus*
13	Gilehri	*Eurambulus pennant*
14	Bandar	*Macaques mulatta*

Birds

1	Chir Fijent	*Catreus wallichii*
2	Kalij Fijent	*Lophura Leucomelana*
3	Koklaj Fijent	*Pucrassia macrolophus*
4	Kala Irgal	*Letinaetus makavensis*
5	Karorla	*Urocissa erythsorhyncha*

Sl. No.	Wild Animal	
	Local Name	**Scientific Name**
1. **2.**	Ullu	*Strix aluco nivicola*
3. **4.**	Baaj	*Flaco severaus*
5. **6.**	Kala Titar	*Francolinus francolinus*
7. **8.**	Papiha	*Cuculus varius*
9. **10.**	Tota	*Psittacula humalayana*
11. **12.**	Chakor	*Alectoris graeca chuker*
13. **14.**	Hariyal	*Treron spenura*
15. **16.**	Pashchimi Tregopan	*Tragopan meloccephalus*
17. **18.**	Bulbul	*Pyconotus cafer*
19. **20.**	Maina	*Aerioctheres tristis*
21. **22.**	Fakhta	*Streptobelia orientalis meena*
23. **24.**	Gidh	*Gyps himalayensis*
25. **26.**	Kauwa	*Carvus macrornynchos*
27. **28.**	Saat Bahen	*Teyrdoides striatus*
29.	Neelkanth	*Garrulus Lanaclatus*

3. Biosphere Reserves

73. 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 Biosphere Reserve (NDBR) established second among the 14 is situated in the State of Uttarakhand. It extends in the three districts of Chamoli (Garhwal), Pithoragarh, and Bageshwar (Kumaon). The Nanda Devi National Park (NDNP) and the Valley of Flowers are UNESCO World Heritage Site declared in 1988. The NDNP is located in the transition range between the Zanskar range and Himalayan foothills with 97 species of plants including many rare and almost extinct plants like *Saussurea sudhanshui*, N*ardostachys grandiflora*, *Picrorhiza kurroa*, *Cypripedium elegans*, *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*), Goral (*Nemorhaedus goral*), Snow Leopard (*Panthera uncia*), Common Leopard (*Panthera pardus*), Himalayan Black Bear (Selenarctos thibetanus), Common Langur (Presbytis entellus), and Rhesus Macaque (*Macaca mullata*). Also, there are about 114 avian species and 27 species of butterflies in the NDNP.

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

75. The Jim Corbett National Park covers 520 sq kms of Savannah-type grasslands and Sal forests. Declared as a Tiger Reserve in 1973, the Park has a rich diversity including the White Tiger, Throated Martem, Himalayan Palm Civet, Indian Grey Mongoose, Para, Kakka, Ghoral, Bar-headed Goose, Duck, Grepe, Snipe, Turtles, Python, Common Otter, Porcupine, Clack-taped Hare, Chital, Spotted Deer, Viper, Cobra, Krait, King Cobra, Tortoise, Graylag, Sandpiper, Gull, Cormorants and Egrets. There are 488 species of flora found protected in the Park including Sal, Savannah Grass, Anogeissus-*Acacia catechu* forests, *Mallotus philippensis*, Jamun and *Diospyros tomentosa*.

76. 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.

77. 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

78. 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

79. 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.

80. 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.

2. Land Use and Land Use Pattern

81. 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 nearer to springs.

83. Forest is the main land use in the State. 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.

E. Health

82. 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

83. 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

84. 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.

85. 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.

86. 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.

87. 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.

88. 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.

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

G. Economic Development

1. Transportation and Communication

90. 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 2006-07, Uttarakhand has a total road network of 23,274 km of which 2,228.90 km comprises the National Highway (1,328.30 km with State PWD and 900.60 km with BRTF); 1,553.00 km comprises the State Highway; 579.85 km covers the MDR; 7,154.88 km comprises the ODR (6723.90 km with State PWD and 430.98 km with BRTF), and 7,250.53 km to the Village Road. Light vehicle roads constitute of about 2,633 km.

91. 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.

92. 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.

TableIV-13. Transportation of Uttarakhand state.

S.N.	Items	Year/ Period	Unit	Statistics
(A)	**Motor Roads Maintained by PWD**			
	(i)National Highways	2011-12	Km.	1375.76
	(ii)State Highways	2011-12	Km.	3788.20
	(iii)Major District Roads	2011-12	Km.	3289.74
	(iv)Other District Roads	2011-12	Km.	2945.04
	(v)Rural Roads	2011-12	Km.	14543.89
	(vi) L.V. Roads	2011-12	Km.	858.22
(B)	**Motor Roads Maintained by BRTF**			
	(i)Total length of Roads	2011-12	Km.	1281.32
(C)	**Motor Roads Maintained by Local Bodies**			
	(i)District Panchayats	2011-12	Km.	862.45
	(ii)Urban Local Bodies & Others	2011-12	Km.	1974.30
(D)	**Roads Maintained by Other Departments**			

	(i)Irrigation	2011-12	Km.	741
	(ii)Cane Development	2011-12	Km.	885
	(iii) Forest	2011-12	Km.	3257
	(iv) Others	2011-12	Km.	1685
(E)	**Postal and Communication Services**			
	(i)Post Offices	2011-12	No.	2718
	(ii)Telephone Exchanges	2011-12	No.	477
	(iii)Telegraph Offices	2011-12	No.	2
	(iv)PCOs	2011-12	No.	8429
	(v)Telephone Connections (Including WLL)by BSNL	2011-12	No.	278751
	(vi) Mobile phone by BSNL	2011-12	No.	1360674

2. **Industrial Development**

93. 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.

94. 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 industrialization. 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.

95. 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

96. 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.

97. 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.

98. Agriculture in Uttarakhand is very complex and is interlinked with crop husbandry, animal husbandry and forestry to form a production system. During the year 2001-02, contribution of agriculture to Net State Domestic Product (NSDP) of the State was about 30 percent and engaged about 58 percent of the total workers. Agriculture in the State is characterised by the following:

99. Out of 7.93 lakh hectare of agriculture land, hilly region covers 56.8 percent and plain region covers 43.2 percent. The cropping intensity in Uttarakhand is 163.79, which is much higher than country's average of 129. 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. Monocropping is a common practice in the irrigated areas whereas mixed cropping is common in rainfed areas. Eighty five percent of the gross cultivated area is used only for growing food grains where value addition is low. More than 62 percent of the State Net Domestic Product comes from the three major towns of Dehradun, Nainital, and Haridwar.

100. 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 or agricultural biodiversity.

Figure IV-6. Agricultural Map of Uttarakhand State

101. 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

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*)

102. 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).

103. The irrigation facility is only available adjoining to rivers in valleys. The cross drainages are required in project roads for durability of strengthening work. 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

3. **Fisheries**

104. 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 punetatus*, *C. gaehua*, and *C. striatus*.

I. Energy and Electric Power Potential

105. 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.

106. 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

107. Pithoragarh is rich in natural beauty and it offer best view of the Himalaya Some of the peak like Nanda Devi, Panchuli, Trishul and Nandakhat falls in this district. It is also rich in flora and fauna and famous for its bugyal.

108. Pithoragarh is the easternmost district of Uttarakhand, neighbouring Tibet in the north and Nepal in the east. A place of exquisite natural beauty and serenity, Pithoragarh is popularly known as the 'Little

Kashmir'. This captivating town with fascinating forests around it is located at an impressive height of 1,645 m and is nestled in a small valley. Pithoragarh town is a historical landmark. It was a major center of power during the regime of the Chand Kings in Kumaon. From here, pilgrims take their journey to the holy shrines, Kailash and Mansarovar.This valley also nestles the snow-crested peaks Nanda Devi East (7,434 m) and West (7,817 m). Below these mighty peaks lie the alpine valleys and glaciers like Milam, Ralam, Namik and Sundardunga.

111. Pithoragarh is a place of extreme religious and historic significance. There are numerous famous temples dedicated to Gods and Goddnesses in the proximity of Pithoragarh. Other places of interest in Pithoragarh are Patal Bhuvaneshwar (Gangolihat), Chandak, Dewalthal, Dharchula, Munsiyari and Kali Mandir of Gangolihat. Kumaon University College is the main educational institution in the district for higher studies. About 5 km. from the place, there is a small and beautiful place named Chandag which houses an asylum for lepers. It is said that a goddess killed two devils, Chand and Mund, at this place. The episode gave the place the name Chandghat. Pithoragarh Fort: It is set atop a hill on the outskirts of the town. The fort was built by the Gorkhas in 1789. Kapileshwar Mahadev (3 km): The cave temple dedicated to Lord Shiva affords a fine view of the Soar valley and lofty Himalayan peaks.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

112. 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:

a. **Location impacts.** Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities

b. **Design impacts.** Impacts arising from project design, including the technology used, scale of operations, discharge standards, etc

c. **Construction impacts.** Impacts resulting from construction activities including site clearance, earthworks, civil works, etc

d. **O&M impacts.** Impacts associated with the operation and maintenance of the infrastructure built in the project.

113. 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

114. The proposed subproject locations belong to private land. Proper methodology followed for land acquisition. No resettlement due to the proposed subproject components.

1. Land Ownership

115. The sub-project area is covering 1 Districts of Kumaon region in Uttarakhand namely- Pithoragarh. A total of 2 locations are proposed for construction of FRP under UEAP (Tourism).

116. There is no resettlement issue envisaged in case of all 02 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.

117. The location selected for construction of FRP huts an objective to restore tourism in the affected areas and also use the structure as Emergency Evacuation Point. 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.

II. Impact on existing or proposed land use

118. There is no land acquisition as such involved. Most of the proposed FRP huts construction are proposed on the land belonging to government. The connecting road to sites for proposed FRP are not new construction but are existing roads. 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

119. 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 (since most of the sites are extension to existing Tourist rest houses), and are outside areas demarcated for habitat protection and conservation.

Table V-1: Location Impacts for Tourism Assets in District Pithoragarh

S.No	District	Land Availability	Location Impacts
A	Pithoragarh	Private Land	Implementation of the project will not have any Bearing on ecology and environment of the locality. Since 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.

120. Though minor civil works are involved in the sub project as major component comprises of the installation of pre-fab structures, 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

121. 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.

122. 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- KMVN (PIU) and Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) for safe disposal sites.

4. Construction Impacts

123. 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.

5. Operation and Maintenance Impacts

124. Regarding FRP Huts proposed in the premises of KMVN it is proposed to lease out the developed asset for tourism business and day to day operation and maintenance to respective TRH. A MOU in this regard is proposed between the state authority (SDMA/UTDB) & KMVN authority with following provisions: The day to day operation and maintenance of the FRP Huts shall be the responsibility of respective KMVN.

125. During normal course of time the FRP Huts can be utilized by the KMVN authorities for the benefit of Tourism. During natural calamity/emergency time the district administration will have the sole right for use of FRP Huts and KMVN authority will abide by the instructions of the SDMA & District Administration regarding the use of FRP Huts.

The KMVN will be required to pay lease rental charges to state authority (SDMA/UTDB)

B. Benefits

126. Primary beneficiaries would be the communities of the affected district in the state and the tourist visiting in this area 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.

C. Cumulative Impact Assessment

127. 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.Since the subprojects will be built in existing infrastructures, government-owned land, and areas designated for tourism activities, these will not conflict with existing or planned land use. However, traffic management concerns will occur spatially during construction. 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.

128. 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 mind set 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.

129. Implementation of the project will not have any bearing on ecology and environment of the locality. Since the buildings will be constructed in vacant government lands it will not involve any displacement of people or disruption of any economic activity. All the infrastructure units are proposed to be constructed outside ecological sensitive area. The construction activity will involve only minor building foundation excavation which will be filled up with soil after the construction. The project will not influence the flora or fauna of the locality in any way.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

Table VI-1 List of Stakeholders Consulted.

A. Public participation during the preparation of the IEE

130. 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.

131. 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, Kumaon Mandal Vikas Nigam (KMVN), 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: Sirkha
District: Pithoragarh
Date : 29.05.2016
Participant: Third party Social Expert and Villagers

1.

Issues Discussed:

- Impact on the local environment due to Construction
- People's expectation for employing generation during construction
- 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 construction.

Place: Tola
District: Pithoragarh
Date: 30.05.2016
Participant: KMVN official and Villagers

1.	**Issues Discussed:** • Impact on the local environment due to construction. • People's expectation for employing generation construction. • 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 Construction.

B. Future Consultation and Information Disclosure

132. 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

133. 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.

134. 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.

135. The PIU/PMU, will conduct information dissemination sessions in the subproject area. During EMP implementation PIU, 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 Construction

136. 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

137. 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 MECHANSIM

A. Environmental Management and Monitoring Plan (EMMP)

138. The EMMP designed will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMU and PIU (KMVN) 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.

139. 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.

140. 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.

141. 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

142. 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 (KMVN) Limited for effective implementation of environmental safeguards related requirements of the tourism infrastructure sub-projects. The institutional arrangements and responsibilities are detailed below.

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

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

145. 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 KMVN; and it would guide the IA and the civil works contractors in this regard. , KMVN 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 (KMVN) and/or Safeguards Staff of UEAP, SDMA for the duration of the Contract;
- May, on the recommendation of the Environmental Expert (EE), KMVN and/or Safeguards Staff of UEAP, SDMA, through the KMVN 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 (KMVN) 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, KMVN and/or Safeguards Staff of UEAP, SDMA, through the KMVN 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 KMVN

- 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 KMVN, F-PIU & IA and take steps for implementation of remedial measures in consultation with the Engineer (KMVN), and reports to the Engineer (KMVN) on the status in its each monthly report till satisfactory resolution.

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

147. 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 Plan

148. 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:

e. 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.

f. Compliance with all mitigation measures and monitoring requirements set out in the EMMP.

g. Submission of a method statement detailing how the subproject EMMP will be complied with. This shall include methods and schedules of monitoring.

h. Monitoring of project environmental performance including performance indicators defined therein, and periodic submission of monitoring reports.

i.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.

j.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 KMVN.

k. 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.

149. 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

150. 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.

151. 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.

152. 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

153. Dismantling of existing structures: Debris Disposal shall be maximum utilized and disposed as per norms after consultation with KMVN/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

154. 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.

155. 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

156. 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.

157. 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.

158. 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

159. 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

160. 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.

161. 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

162. 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.

163. 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.

164. 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 Safeguard Expert of PIU. 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, KMVN, 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, KMVN, IA & 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	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO.	Once in a Quarter where work is in	Contractor, to

quality		progress and near sensitive receptors; and at the construction camp sites (except monsoon) for the entire construction period	be monitored through NABL Accredited Laborator
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/F-PIU
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

165. 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.

166. 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 KMVN 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.

167. 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).

168. 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 during construction stage are also to be borne by the contractor. These are deemed to be included as part of the

contract price amount quoted by the contractor for the works. The costs for generation of 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.

169. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with 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 VIIII-2: Environmental Management & Monitoring Costs

Sl. No.	Particulars	Stages	Unit	Total No.	Rate (INR)	Cost (INR) *	Source of fund
A.	Legislation, permits and Agreements	Consent to Establish and Consent to Operate for plants and machinery of the Contractor					The cost for clearances, 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	10,000	20,000	
C. Environmental Baseline Data Generation							
1.	Ambient Air Quality Monitoring	Pre-Construction	Per Sample	2	20000	40000	Contractors cost
2.	Noise Quality monitoring			2	4000	8000	
3.	Water Quality monitoring			2	12000	24000	
4.	Soil			2	12000	24000	
D.	**Environmental Monitoring**						
1	Air quality	Construction	Per Sample	12	20000	240000	
2	Water quality		Per Sample	6	12000	72000	
3	Noise Levels		Per Location	12	4000	48000	
4	Soil			6	12000	72000	
5.	Dust Suppression at subproject sites	construction and defect liability phases	lump sum		lump sum	20000	
6	Ambient Air Quality	Operation/ Defect Liability Period	Per Sample	2	20000	40000	Implementing Agencies cost/ Contractors cost
7	Water quality		Per year	2	12000	24000	
8	Ambient Noise Quality		Per	2	4000	8,000	

l. No.	Particulars	Stages	Unit	Total No.	Rate (INR)	Cost (INR) *	Source of fund
			Sample				
E.	**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		02	10,000	20,000	PMU/KMVN
					Total INR	640000/-	

F. Environmental Monitoring and Reporting

170. 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 KMVN/Engineer on day to day basis. KMVN / 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.

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

172. 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, KMVN	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	Contractor and EE	F-PIU, 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
		operate critical items of mechanical equipment without having been trained by the Contractor			
		All employees must undergo safety training and wear the necessary protective clothing /equipment	Contractor and EE	IA & PMU,	
		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	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
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 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.	Contractor with the Engineer, EE & F-PIU	IA & PMU,	
		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	
		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	Engineer and EE	IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		construction.			
		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	
2.	**Design Impacts and Pre-construction Impacts**				
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	
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	
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	Engineer, EE, and F-PIU	IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		keeping in view that no asbestos (except as allowed), and CFC is used.			
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	
2.5	Integration of energy efficiency and energy conservation programs in design of sub-project components	The detailed designs for the sub-project components shall ensure that environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, rainwater harvesting etc.	Engineer, EE, and F-PIU	IA & PMU	
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	Contractor	Engineer, EE, and F-PIU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
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 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.	Contractor with the Engineer and EE	F-PIU, IA & PMU	
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.	Contractor	Engineer and EE	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		The cleanliness of the storage tanks will be ensured and all measures to be taken to avoid any water contamination.			
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 not be disposed off near the water course or agricultural land, Orchards and Natural Habitats like Grasslands.	Contractor with the Engineer	F-PIU, IA & PMU	
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	
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.	Contractor with the Engineer	F-PIU, IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
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 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.	Contractor with the Engineer	F-PIU, IA & PMU	
3.7	Soil/Land Erosion	Slope protection measures will be undertaken as per design to control soil erosion.	Contractor with the Engineer	FPIU, IA & PMU	
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	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
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 if any.	Contractor	EE of Engineer, F-PIU & PMU	
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	
3.11	Generation of dust	The Contractor will take every precaution to reduce the levels of dust at construction	Contractor	Engineer, F-PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		site. Regular sprinkling of water and Stockpiles of soil will be kept covered in such a manner to minimize dust generation.			
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 whenever required.	Contractor	Engineer, F-PIU & PMU	
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.	Contractor with the Engineer	EE, F-PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
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 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.	Contractor	Engineer, F-PIU & PMU	
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	
3.16	Safety Measures During	Personal Protective Equipment for workers	Contractor	Engineer, F-PIU &	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
	Construction	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 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.		PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
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	
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 protection in-situ.	Contractor	Engineer, FPIU & PMU	
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	
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	Contractor	Engineer, F-PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
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	
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 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:	IA, EA and Tourism Department	SDMA, PMU & GoUK	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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	

EE= Environmental Expert of Engineer (KMVN), , IA= Implementing Agency, EA= Executing Agency, FPIU= Field Project Implementation Unit (KMVN)

G. Performance Indicator

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

Table VII-4: Performance Indicators of EMMP

S.No	Performance Indicators	Target	Achievement in Semi-annually and annually
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	Total Number of samples collected
3.	Noise Level	Total Number of samples as per Environmental Monitoring Plan	Total Number of samples collected
4.	Water Quality	Total Number of samples as per Environmental Monitoring Plan	Total Number of samples Collected
5.	Soil	Total Number of samples as per Environmental Monitoring Plan	Total Number of samples Collected
6	Safety of Workers	List of PPE as per the number labours	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.	Number of public consultation conducted till 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	No of staff actually
13.	Capacity Building	Total number of sessions to be covered Total Number of contractors, PIUs and KMVNs to be covered	Number of Sessions completed and Number of contractors, PIUs and KMVNs.
14.	Implementation of EMP mitigation Measures	All items of Environmental Management Plan with timeline and its respective regulatory standards like for Amebient air Qaulity ♠ NAAQS, 2009 standards, Drinking water ♠ IS:10500 etc, Residual Chlorine ♠ UEPPCB standards and CPHEEO manual for handling.	Implementation status of EMP items till date
15.	Reporting	List and number of Report to be submitted	List and number of reports submitted

F. Grievance Redress Mechanism

174. 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.

175. 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.

176. 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.

177. 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.

178. 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

179. 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.

180. 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.

181. 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 KMVN Consultants. Further, the environmental monitoring plans provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages.

182. 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.

183. In conclusion, the sub-project will have overall beneficial impacts after completion in terms of enhancement in emergency preparedness by construction of FRP huts 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.

184. 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.

185. 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

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	**Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand**
• 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
[ ] Project and/or Site Description
[ ] Other:

E. Comments

Project Team Comments: In Tourism Sector under ADB Emergency assisted UEAP, the Renovation and up-gradation of Damaged Tourism Assets in Disaster Affected Districts Chamoli & Uttarkashi, also considering the future preparedness to provide emergency evacuation shelters to tourist & pilgrims the proposed project **Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand** 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.

F. Recommended for Approval

Prepared by: Environment Expert PIU (Tourism) (Dr. Mahadev Semwal)		**Sign. of Support Assistant Engineer, Field, PIU (Tourism)**
Date:		**Date:**
		Abhay Bahuguna (Dr. Abhay Bahuguna)
(Sign. of Procurement Specialist , PIU (Tourism)		**Reviewed by: Environment Officer PIU**
Date:		**Date:**
		Abhay Bahuguna (Dr. Abhay Bahuguna)
(Sign. of Deputy Program Manager Tourism		**Verified: Environment Officer, PMU**
Date		**Date:**

Endorsed by: Program Manager, IA, Tourism

ENVIRONMENT CATEGORIZATION

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Construction of FRP HUTS in Disaster Affected District Pithoragarh 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

Country/Project Title: India/Loan 3055-IND Uttarakhand Emergency Assistance Project (UEAP): **Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand**

Sector/Division: Tourism Department, Government of Uttarakhand

Screening Questions	Yes	No	Remarks
A. Project Sitting is the project area adjacent to or within any of the following environmentally sensitive areas:		√	Construction of 11 FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand. None of the project site is adjacent to any environmental sensitive zone**.**
▪ Cultural heritage site		√	
▪ Legally Protected Area (core Zone or buffer Zone)		√	
▪ Wetland		NA	
▪ Mangrove		NA	
▪ Estuarine		NA	
▪ Special area for protecting biodiversity		√	
b. potential environmental impacts will the project cause.			
• 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)?		√	

Screening Questions	Yes	No	Remarks
• 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. Works involving Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand , 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.
▪ 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.
▪ 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.

Screening Questions	Yes	No	Remarks
▪ 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?		√	Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand 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 Construction of FRP HUTS in Disaster Affected District Pithoragarh Uttarakhand 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.

Apendix-2: Public Consultation Record

Sirkha

PUBLIC CONSULTATION RECORD

Name Of Project: Uttarakhand Emergency Assistant Project

Project Package No: UK/UEAP-T (KMVN)NTL/O (ADB LOAN NO. 3055-IND)

Location to be improved

Place of Public Consultation : Dharchula

Tehsil/Village : Dharchula

District: Pithoragarh

Date: 28/5/16

List Of Stakeholders/Participants in Public Consultation

S.no	Name &address	Occupation	Signature
1	Mahiman Singh Hayanki, S/o Dhan Singh Hayanki, Vill. Sirkha, Post Sirkha, Teh Dharchula	Retired (Land owner)	[illegible]
2	Sobhan Singh S/o Sri Vijay Singh, add. as above	Service (Dharchula)	[illegible]
3	Kishore Singh S/o Sri Mohan Singh, Vill Sirkha Post Sirkha, Teh Dharchula (Land owner)	Business	[illegible]
4	Seema Hayanki D/o Sri Mangal Singh, add. as above	Service	[illegible]
5	Bachi Hyanki W/o Sri Mangal Singh, add. as above (Land owner)	House wife	[illegible]

Apendix-2: Public Consultation Record

Tola

PUBLIC CONSULTATION RECORD

Name Of Project : Uttarakhand Emergency Assistant Project

Project Package No. : UK/UEAP-T (KMVN)/NTL/O (ADB LOAN NO. 3055-IND)

Location to be improved : ToLA

Place of Public Consultation Tehsil/Village : Munsyari

District : munsyari

Date : Pithoragarh.

: 30/5/16

List Of Stakeholders/Participants in Public Consultation

S.no.	Name &address	Occupation	Signature
1.	Sri Kundan Singh Tolia S/o Sri	Ex. Block Pramukh	
2.	Sri Nathu Singh Tolia S/o Sri Dayan Singh Tolia. add. as above.		नाथू सिंह
3.	Sri Ganger Ram Add. as above,		गंगा राम
4	Sri Netra Singh Tolia add. as above		नेत्र सिंह

APPENDIX-3: PUBLIC CONSULTATION

Public consultation for Sirkha

Publich Consultation for Sirkha

Public Consultation for Tola

Public Consultation for Tola

APPENDIX-4: Site Photographs

Tola

Sirkha

APPENDIX-5: GRDC

परियोजना प्रबन्धन ईकाई
उत्तराखण्ड डिजास्टर रिकवरी प्रोजैक्ट एवं
उत्तराखण्ड इमरजेन्सी असिस्टेंस प्रोजैक्ट
सिडकुल बिल्डिंग 29 आई.आई.ई. (आई.टी. पार्क) सहस्त्रधारा रोड़
देहरादून–248001 उत्तराखण्ड

आपदा राहत एवं पुनर्वास के अन्तर्गत आवास, सड़क, पुल दुर्गम क्षेत्रों के लिये हैलीपैड़, चिन्हित क्षतिग्रस्त सरकारी भवनों, पर्यटन विभाग की परिसम्पत्तियों, बहुउद्देशीय भवनों एवं एफ.आर.पी. हट्स बनाये जा रहे है। उपरोक्त से संबधित किसी भी समस्या के निवारण के लिये परियोजना प्रबन्धन ईकाई एवं जनपद स्तर पर समस्या निवारण प्रकोष्ठ गठित किये गये है, जिनके संपर्क सूत्र निम्नवत है–

इन संपर्क सूत्रों पर कार्यालय दिवसों एवं कार्यालय समयावधि में संपर्क किया जा सकता है।

केन्द्रीय समस्या निवारण प्रकोष्ठ दूरभाष संख्या 0135–2708376,

परियोजना प्रबन्धन ईकाई देरादून ई मेल–grievancepmu@gmail.com

जनपद	नोडल अधिकारी	दूरभाष संख्या
रूद्रप्रयाग	श्री आशीष सेमवाल / राहुल ओयल	8859504022 / 8859504026
चमोली	श्री नन्द किशोर जोशी	9411352136
उत्तरकाशी	श्री देवेन्द्र पटवाल	9410350338
बागेश्वर	कु. रिया सांगरी	8193917518
पिथौरागढ	श्री आर. एच. राणा	9412079945
अल्मोड	श्री राकेश जोशी	9412929707
चम्पावत	श्री मनोज पाण्डे	9412347265
नैनीताल	श्री शैलेश कुमार	9456523808
उधमसिंह नगर	श्री अनिल शर्मा	7417170470
टिहरी	श्री ब्रिजेश भट्ट	—
हरिद्वार	—	—
देहरादून	सुश्री दीपशिखा रावत	9412964936 0135–2710334
पौड़ी	श्री हबिबुर रहमान	9412031195