Initial Environmental Examination

Project Number: 47229-001
December 2014

IND: Uttarakhand Emergency Assistance Project

Submitted by

Government of Uttarakhand, Dehradun

Asian Development Bank

PROJECT MANAGEMENT UNIT
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Ref: - UEAP/2014/A-3/ 203 Date: 26-11-2014

To,
Ms. M Teresa Kho
Country Director, INRM, ADB
4, San Martin Marg,
Chankyapuri,
New Delhi - 21

Subject: **Loan No 3055(IND) – Uttarakhand Emergency Assistance Project – IEE report submission (Package no. UK/UEAP-T (KMVN)/NLT/01(R2)-Pithoragarh)**

Dear Madam,

Please find enclosed the IEE for Construction of FRP huts in disaster affected district Pithoragarh of Kumaon region under Uttarakhand Emergency Assistance Project, (Package no UK/UEAP-T (KMVN)/NLT/01(R2)- Pithoragarh) for your kind approval. It is to inform that the Environmental Assessment for 09 sites out of 16 sites has been carried out owing to the fact that remaining sites are not accessible at present. The IEE report shall be updated as soon as the sites are accessible an Environmental Assessment is completed.

You are requested to kindly accord approval for allowing us to issue LoA for all the sites with a condition only those sites shall be handed over to the contractor and for which Environmental Assessment has been done and ADBs approval received.

Thanking you,

Yours Sincerely,

(Amit Singh Negi)
Program Director

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Initial Environmental Examination

November 2014

India: Construction of FRP Huts in Disaster Affected District Pithoragarh of Kumaon region under Uttarakhand Emergency Assistance Project

Prepared by:- State Disaster Management Authority, Government of Uttarakhand, 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	-	Biological Oxygen Demand
BoQ	-	Bill of Quantities
CO	-	Carbon monoxide
CPCB	-	Central Pollution Control Board
DSC	-	Design and Supervision Consultant
EA	-	Executing Agency
EAC	-	Expert Appraisal Committee
EARF	-	Environment Assessment and Review Framework
EIA	-	Environmental Impact Assessment
EMP	-	Environment Management Plan
ES	-	Environmental Specialist
FPIU	-	Field PIU, Kumaon Mandal Vikas Nigam
FRP		Fiber Reinforced Plastic
GC	-	General Conditions
GMVN	-	Garhwal Mandal Vikas Nigma
GoI	-	Government of India
GoUK	-	Government of Uttarakhand
IDIPT	-	Infrastructure Development Investment Program for Tourism
IEE	-	Initial environmental examination
INR	-	Indian Rupee
KMVN	-	Kumaon Mandal Vikas Nigam
MLD	-	Million Liters per day
MoEF & CC	-	Ministry of Environment, Forests & Climate Change
MFF	-	Multi- Tranche Financing Facility
NGO	-	Non-Governmental Organization
NO_x	-	Nitrogen oxide
PD	-	Project Director
PIU	-	Project Implementation Unit
PM	-	Particulate Matter
PMU	-	Project Management Unit
PUC	-	Pollution under Control Certificate
RP	-	Resettlement Plan
RPM	-	Reparable Particulate Matter
SC	-	Scheduled Castes
SEAC	-	State Expert Appraisal Committee
SEIAA	-	State Environmental Impact Assessment Authority
SO_2	-	Sulphur- di- oxide
SPM	-	Suspended Particulate Matter
SPS	-	Ssafeguard Policy Statement
ST	-	Scheduled Tribe
UEPPCB	-	Uttarakhand Environmental Protection and Pollution Control Board
UJS	-	Uttarakhand Jal Sansthan

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EXECUTIVE SUMMARY

1 The Uttarakhand Emergency Assistance Project for Tourism sector envisages economic and social recovery in Uttarakhand in the aftermath of the June 2013 disaster. The project will assist the Government of Uttarakhand (GoU) to meet reconstruction needs due to disaster in Uttarakhand in June 2013 that severely affected several parts of Uttarakhand. The districts of Pithoragarh, Chamoli, Rudraprayag and Uttarkashi were directly affected by this disaster. These regions are among the country's most important pilgrimage centers which suffered massive losses as the disaster occurred during the peak pilgrimage season. Several towns have been washed away by the unprecedented flash floods and landslides and a large number of houses, public buildings, roads and bridges, urban and rural infrastructure have been damaged.

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 Pilgrim Yatra being washed out. 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 Fiber Reinforced Plastic (FRP) huts are proposed in the disaster affected district Pithoragarh of Kumoan region to increase the accommodation capacity of the existing Rest houses run by Kumoan Mandal Vikas Nigam (KMVN) and to provide improved accommodation facilities to the tourist / pilgrims visiting this area.

5 The selection of components is consistent with the subproject selection criteria outlined in the Environmental Assessment and Review Framework (EARF) aimed to help in reviving tourism in the affected region. The IEE is prepared in accordance with ADB's Safeguard Policy Statement (2009) (SPS 2009). An environmental monitoring and management plan (EMMP) outlining the specific environmental measures to be adhered to during implementation of the subproject has been prepared. Subproject will provide ecologically suitable tourist infrastructure to promote climatic resilient tourism in the fragile locations, better environmental management and quality of the sites towards preserving their ecological and cultural integrity and improve the emergency preparedness as the structures are designed in view of sensitivity to disasters. The subproject will conform to all

Government regulations (GOI), policies, and standards, as well as Asian Development Bank's Safeguard Policy Statement (2009).

6 Thus construction of environmentally sustainable, affordable accommodation for tourists with eco-friendly material would help in bridging the gap in the shortage of accommodation in the State during the tourist season. Provision of affordable accommodation to tourists at various destinations in the form of cottages which are aesthetically and eco-friendly designed, taking into consideration the natural landscape of the area will be a boost for tourism sector.

7 This Initial Environmental Examination (IEE) assesses subprojects for the Tourism Sector for the sub project "**Construction of FRP HUTS in Disaster Affected District Pithoragarh of Kumaon region in Uttarakhand State**". The IEE is based upon the Environmental Assessment and Review Framework (EARF) which is in consistent with the ABD's Safeguard Policy Statement (SPS) 2009. The subproject is classified as —Category "B" for Environment and does not require further Environmental Impact Assessment. In the present IEE certain baseline data is not available for water, noise and air quality. Therefore it is proposed that before the commencement of work, sampling for these parameters be conducted.

8 **Project Area:-** Project sites lies within the two eastern side district Pithoragarh of Kumaon region. The topography of area is characterized by hilly terrain, rugged and Rocky Mountains, deep valleys, passes, alpine meadows, high peaks, sharp streams and rivulets, rapid soil erosion, frequent landslides and widely scattered habitations.

9 **Seismicity:-** The State constitutes one of the most active domains of the Himalayan region. Several damaging earthquakes are recorded from Uttarakhand. As such, the region is classified under high seismic zone VI & V.

10 **Forest**:- As per the State of Forest Report 2013, Uttarakhand has an area of 24495 km^2 under forest covered area which is 64.79 % of the total geographic area (53483km^2). 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.

11 **Sensitive Ecosystem**. The subproject located in district Pithoragarh does not fall within any sensitive ecosystem. The project component/ features will not have any possibility of direct intervention nor indirect intervention with sensitive ecosystem. Adequate measures will be taken as per requirement during construction and operation and included in EMP.

12 **Air Quality**:- The pristine environment and sparse population suggest that most part of the project area have a very good air quality while noise level is calm except in urban areas. The baseline of air quality and noise level will be generated before commencement of the construction.

13 **Significant Environmental Impacts and Proposed Mitigation Measures**:- No environmental impacts related to siting were identified in the environmental examination.

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.

14 **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.

15 **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.

16 **Conclusion**:- The initial environmental examination ascertains that the sub-project is unlikely to cause any significant environmental impacts. No additional studies or need of undertaking detailed EIA is envisaged at this stage. The Executing Agency shall ensure that EMP is included in Bill of Quantity (BOQ) and forms part of bid document and civil works contract. The same shall be revised if necessary during project implementation or if there is any change in the project design and with approval of ADB.

INTRODUCTION

A. Project Background/Rationale:-

17. 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 Emergency Assistance Project (UEAP)

18. 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.
19. 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. ADB agreed to assist the Government of India (GOI) with reconstruction and rehabilitation efforts for which the Uttarakhand Emergency Assistance (Sector) Project (UEASP) has been formulated as a multi-sector emergency loan in sector loan modality. The executing agency (EA) for the UEASP will be Government of Uttarakhand (GOU) and State Disaster Management Authority (SDMA). The primary implementing agencies (IA) will be Public Works Department (PWD) for roads, bridges, urban roads, and trekking routes including eco-trails Department of Tourism (DOT) for tourism infrastructure through Kumaon Mandai Vikas Nigam Limited, and Garhwal Mandai Vikas Nigam Limited, Uttarakhand Civil Aviation Development Authority (UCADA) for helipads; and Uttarakhand Jal Sanstahan (UJL) for urban water supply, or any successor hereto. Some other state agencies such as Forest Department are likely to be entrusted with some works under UEASP under these primary IAs.

C. Purpose of the Environmental Assessment

20. The environmental study undertaken is aimed at identifying existing environmental conditions, predicting environmental impact associated with the project and suggesting mitigation measures to reduce or eliminate the predicted impact. The different activities that are likely to take place have been analyzed and proposed mitigation measures are assessed for their adequacy. Further mitigation measures have been proposed where considered necessary. The study also aims at reflecting the acceptability of the project to different stakeholders, and at incorporating the concerns raised by them into impact assessment and of the subsequent Environmental Management Plan.
21. The main purpose of this IEE is to provide environmental assessment of the proposed Construction of FRP Huts in Pithoragarh District of Kumaon region. 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 minimise the adverse environmental impacts, if any, associated with construction and operation. The key environmental impacts on natural and human environments have been assessed.

22. The Objectives of this Initial environmental examination (IEE) were to:

- Assess the existing environmental conditions in the project area including the identification of environmentally sensitive areas
- Assess the proposed planning and development activities to identify their potential impacts, evaluate the impacts, and determine their
- Assess the compliance with ADB environmental safeguard requirements and applicable environmental laws,
- Incorporate mitigation measures in the project design and preparation of environmental management and monitoring plan.

23. This IEE has been carried out to ensure that the potential adverse environmental impacts are appropriately addressed in line with ADB Safeguard Policy Statement, 2009.

D. Extent of IEE

24. 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

25. 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). Following this introduction this report contains seven more sections including (ii) Policy, Legal and Administrative Framework, (iii) Description of Project, (iv) Description of Environment, (v) Anticipated Impacts and Mitigation Measures, (vi) Information Disclosure, Consultation, and Participation, (vii) Environment Management Plan and Grievance Redress Mechanism, and (viii) Conclusion and Recommendation.
26. This IEE is based mainly on secondary sources of information, field reconnaissance surveys, review of legal requirements, identification of impacts and mitigation measures, impact assessment and institutional review and public consultation undertaken specifically for this study was also undertaken.

F. Methodology

27. 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, secondary data collection, impact assessment, consultation with stakeholders, identification of impacts and mitigation measures, and institutional review. Keeping in view of emergency restoration and nature of work (limited to restoration only on existing ROW) no

primary environmental data has been generated. However, prior to start of construction baseline monitoring is proposed in EMP.

G. Public Consultation

28. Keeping in view of nature of work which is limited to restoration and minor civil work for the construction of FRP, only Informal consultations were made with concerned stakeholder's that includes: local residents, Govt. Departments/agencies 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 measure.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

29. 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/Notifications/Guidelines and Application to Road Projects	Concerned Agency	Applicable to Contract package	Responsibility	Status of Compliance
A. Pre-construction Stage						
1	Environmental 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	SEIAA, If not constituted then MoEF & CC	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 land is between to 20 hectare, then permission from 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. MoEF extended the specific guidelines in June 2014 for state of Uttarakhand expediting forest clearances to carry out the emergency work in forest areas (excluding works in national parks and sanctuaries)	District Level Committee constituted by the State Govt.	No	F-PIU, KMVN	Not Required

S.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Road Projects	Concerned Agency	Applicable to Contract package	Responsibility	Status of Compliance
		vide no 11-298/2013-FC Dated 23.06.2014				
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 thereto. 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 entries in the sanctuary.		No	No	Not 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
B. Construction Stage						
5	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	UEPPCB, Dehradun	No	Contractor	Not required
6	Permission for Sand Mining from river bed	Mines and Minerals (Regulation and Development) Act, 1957 as amended in 1972	River Board Authorities/ Department of Mining Govt. of	No		Not required

S.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Road Projects	Concerned Agency	Applicable to Contract package	Responsibility	Status of Compliance
			Uttarakhand			
7	Consents to establish & operate Hot mix plant, Crushers, Batching Plant	Air (Prevention and Control of Pollution) Act 1981	UEPPCB	Yes	Contractor	
8	Authorization for Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989 as amended 2003	UEPPCB	No	Contractor	Not required
9	Consent for Disposal of Sewage from Labour camps	Water (Prevention and Control of Pollution) Act 1974	UEPPCB	No	Contractor	Not required
10	Use of Fly ash within 100 kms around Thermal Power plants	Fly Ash Notification, 1999 as amended up to 17th August 2003:	MoEF & CC	No	Contractor	Not required
11	Pollution Under Control Certificate	Central Motor and Vehicle Act 1988	Department of Transport, Govt. of Uttarakhand	Yes	Contractor	
12	Installation of Generators	The Air (Prev. & Con. of Pollution) Act, 1980	UEPPCB	Yes	Contractor	
13	Employing Labour/workers	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996,	District Labour Commissioner	Yes	Contractor	
14	Permission for extraction of boulder and sand from riverbeds	Mines & Minerals (Regulation and Development) Act, 1957 and its amended in 1972	Department of Mines and Geology Government of Uttarakhand	No	Civil Work Contractors	Not required
15	License for Storing Diesel and other	Petroleum Rules, 2002. Hazardous Waste (Management and Handling)	Commissioner of Explosives and	No	Contractor	Not required

S.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Road Projects	Concerned Agency	Applicable to Contract package	Responsibility	Status of Compliance
	explosives	Rules 1989.	UEPPCB			
C. Implementation Stage						
16	Consent to Establish & Consent to Operate for Installation of Generators	The Air (Prev. & Con. of Pollution) Act, 1980	UEPPCB	Yes	F-PIU, KMVN	KMVN shall obtain the required consent from UEPPCB

III. DESCRIPTION OF THE PROJECT

A. Project Location

28. The locations for FRP have been identified in district Pithoragarh because the impact of climatic mishaps in this part of Uttarakhand was maximum, huge, and also some of the most frequented tourist destinations for the pilgrims and adventure lovers are situated here. The work is proposed for the construction of FRP huts in as a part of Tourism Restoration Drive. This would compensate for the loss of tourist accommodation units and would involve minimum concrete works thus saving time and would be in tune with the ecological balance of the region. It would also strengthen state's coping mechanism and help in reviving tourism in the affected region.

B. Proposed Category of the Project

29. Pursuant to the requirements of the ADB Safeguard Policy Statement (2009) proposed Construction of FRP Huts in 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 Kumaon Mandal Vikas Nigam. Consistent with the Environmental Assessment and Review Framework, the subproject was screened using the ADB rapid environmental assessment (REA) checklist- General (Tourism).

30. 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

31. 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.

32. As a part of Tourism Restoration Drive, it was decided to construct dwelling units in the form of cottages/ tented accommodation made of eco- friendly FRP material in disaster affected Districts. This would compensate for the loss of tourist accommodation units and would involve minimum concrete works thus saving time and would be in tune with the ecological balance of the region. It would also strengthen state's coping mechanism and help in reviving tourism in the affected region. Thus construction of environmentally sustainable, affordable accommodation for tourists with eco-friendly material would help in bridging the gap in the shortage of accommodation in the State during the tourist season. Provision of affordable accommodation to tourists at various destinations in the form of cottages which are aesthetically and eco-friendly designed, taking into consideration the natural landscape of the area will be a boost for tourism sector. These accommodation

facilities would encourage tourists to stay at most frequented locations. These huts can be either extension to existing Tourist Rest Houses or new units, en-route some popular destinations in the affected areas.

D. Subproject Description

33. The locations for FRP huts have been identified in these areas because these areas were severely affected by the climatic mishaps of July, 2013, and also some of the most famous pilgrim destinations (Kailash Mansarovar and Adi Kailash) and adventure glacier treks (Panchchuli, Milam, Ralam, Sona Glacier, Balling, Sobla Tejam, Nandakot etc.) are situated here. Thus districts Pithoragarh of the Kumaon region have been identified as project area in Uttarakhand. Sixteen sites in district Pithoragarh have been identified for the construction of FRP huts. Out of 16 sites only 9 sites have been accessed for environmental impacts due to inaccessibility of remaining 7 sites as indicated in Table III.1. IEE report shall be updated as and when environmental assessment for the remaining sites is completed.

Project Location

District Pithoragarh, Tehsil :- Dharchula

Fig.III.1:- Locations of proposed FRP sites in district Pithoragarh, Kumanon Region

Table III.1: Location of Subproject and status of Environment Assessment

S No	Location of subproject	Subproject components	Status of Environmental Assessment
1.	Pangu	Construction 5 FRP structures proposed on available land with KMVN	DONE

2.	Sirkha	Construction 5 FRP structures proposed on available land with KMVN	DONE
3.	Gala	Construction 5 FRP structures proposed on available land with KMVN	DONE
4.	Malpa	Construction 5 FRP structures proposed on available land with KMVN	DONE
5.	Budhi	Construction 10 FRP structures proposed on available land with KMVN	DONE
6.	Gunji	Construction 10 FRP structures proposed on available land with KMVN	DONE
7.	Kalapani	Construction 5 FRP structures proposed on available land with KMVN	DONE
8.	Nabidhang	Construction 10 FRP structures proposed on available land with KMVN	DONE
9.	Kutti	Construction 5 FRP structures proposed on available land with KMVN	DONE
10.	Mangti	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
11.	Sela	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
12.	Balling	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
13.	Martoli	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
14.	Panchu	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
15.	Burfu	Construction 5 FRP structures proposed on available land with KMVN	Yet to be DONE
16.	Lilam	5 FRP huts on the land available with KMVN	Yet to be DONE

a. Pangu

34. The site is located 18 km from Dharchula and lies at latitude $29^0 59'25''N$ and longitude $80^0 38'63''E$ at an elevation of 1400 m above msl. KMVN had their small Tourist Rest Camp. During Kailsah Masarovar Yatra this camp occasionally facilitate pilgrims visiting to the Adi Kailash and Kailsh Mansarovar Yatra during bad road connectivity. During June 2013, disaster this camp was damaged and now it is not able to accommodate tourist.

35. In order to compensate for the loss of accommodation facilities, construction of five FRP structure is being proposed on the available land at Pangu.

b. Sirkha

36. Sirkha is the first camp for the tourist visiting to Kailsh Mansarovar Yatra and Adi Kailash Yatra 42 km from Dharchula. The site lies at latitude $29^0 59'53''N$ and longitude $80^0 40'50''E$

at an elevation of 1400 m above msl. The camp is located at an elevation of 2010 m above msl on the eastern slope of Tyongi hill. KMVN had little infrastructure at Sirkha Yatra Camp which was partially damaged during the June 2013 landslide. In recent years number of tourist influx has increase in Kailash Mansarovar and Adi Kailash route.

37. In order to facilitate increase number of tourist, construction of five FRP huts in Sirkha yatra camp is being proposed on the available land.

c. Gala

38. Gala is the second camp located on Kailsh Mansarovar Yatra and Adi Kailash Yatra rout and located 2 km ahead of Gala Village. The project site lies at latitude 30^0 01′06″N and longitude 80^0 43′22″E at an elevation of 1400 m above msl. After develoment of road network now tourist can reach directly to Gala from Dharchula in a single day. KMVN has a limited infrastructure in this camp which was damaged partially during June 213 disaster and not capable to accommodate tourist influx.

39. In order to enhance accommodation facility, construction of five FRP huts are being proposed at the available land at Gala.

d. Malpa

40. Malpa lies at latitude 30^0 03′12″N and longitude $80^0$47′47″E at an elevation of 1400 m above msl on the confluence of the Kali and Palangad (stream) 58 km from the Dharchula. The area around Malpa is generally covered by small shrubs while higher ridge-crests and upper slopes are characterized by barren surfaces with scanty grass. However, on the Nepal side across the Kali the area is thickly forested. A small army camp is also located in the area. Tourists going on Kailash Masarovar and Adi Kailash Yatra have their lunch at Malpa, for which KMVN constructed Nissan shade on this site. The rout from Gala to Malpa is prone to landslide and witnessed repeated damaged of the trek rout due to huge landslides and rock-falls. Due to which sometime tourist has to stay one night at Malpa.

41. In order to provide accommodation facilities, construction of five FRP huts are being proposed on the available land at Mala.

e. Budhi

42. This yatra camp lies at latitude 30^0 06′09″N and longitude $80^0$50′11″E and located on the highland available on the confluence of river Kali and Kuringad at the distance of 2 km from the Budhi village. A flat meadow with lush green grass, surrounded by a forest of oak and rhododendron makes it one of the best sites on the route. There are some more camps of armed forces located in the vicinity. KMVN has some infrastructure available at the yatra camp which is too old and damaged during June, 2013 disaster.

43. In order to compensate and provide proper accommodation to the tourists, construction of ten FRP structures is being proposed at the Budhi on the available land.

f. Gunji

44. Gunji is the last village on the Kailsh Mansarovar rout and this yatra camp is located on the highland on the confluence of river Kali and Kutti. The camp lies at latitude 30^0 10′37″N and longitude $80^0$50′47″E and an elevation of 3200 m above msl. There are many other camps of armed forces (deputed on the Indo-Chaina and Nepal borders) sited during the survey. It is the gateway to Adi Kailash and Kailsh Masarovar and two most beautiful valleys created by River Kutti and Kali. From Gunji one way goes to Adi Kailsh rout and another goes to Kailsh Masarovar. From Gunji tourists can see the glimpse of Annpurna peak II (7937 m) (the world's most dangerous mountains to climb located in Nepal), KMVN has some infrastructure available at the yatra camp which is too old and has limited accommodation.

45. For facilitating increasing numbers of tourist, construction of ten FRP structures is being proposed on the available land at Gunji.

g. Kalapani

46. The area lies at latitude 30^0 10′37″N and longitude $80^0$50′47″E and an elevation of 3611 m above msl. Kalapani is the origin place of River Kali (Sharda River), and situated on the Kailash Manarovar route. As the yatris get closer to Kalapani, they will pass a mountain which has Sage 'Vyasa's cave'. According to Hindu legend, this is the cave where Sage Vyasa performed penance for years. A flag posted by the ITBP is indicative of the entrance to the cave. It is believed that the Great Sage Vyasa meditated at this place, giving the region its name, Vyasa valley, locally called Byans valley. A pool by the temple of the Goddess Kali is considered the source of the Kali River. A verdant valley covered with Pine, Bhojpatra and Juniper trees. There is no such human settlement in terms of village located in the vicinity but camps of armed forces and traders can be seen at this place. KMVN has limited infrastructure at this camp.

47. In order to facilitate increasing number of tourists, construction of five FRP structure is being proposed at Kalapani.

f. Nabidhang

48. This site is the highest point on the yatra rout lies on $30^0$10′37″N and longitude $80^0$50′47″E at an elevation of 4251m above msl. Nabidhang is the last Indian army post and last yatra camp at Indian side. It is from the camp at Nabhidhang that one can view the unique phenomenon of 'Om' on Himalayan range. The mountain on the eastern side, Om Parvat, has patterns on the snow, which resemble a naturally formed 'Om', a rare sight since the mountain is usually wreathed in clouds. The stretch from Kalapani to Nabhidhang is an uphill climb. As the yatris move to the upper reaches of the Himalayas, the vegetation and

tree line will be left far below. KMVN has some infrastructure available in Nabhidhang which is too old and damaged and couldn't be utilized any more.

49. In order to enhance the accommodation facility at Nabhidhang, construction of five FRP huts are being proposed on the available land at Nabidhang.

g. Kutti

50. Kutti is last the village on Adi Kailsh rout located at an elevation of

51. KMVN have a small camp (which runs over tents) and located at 1.5 km distance from the village. For giving better accommodation to the tourists KMVN has proposed to construct 5 FRP huts at the Kutti camp.

E. Project Implementation Schedule

52. Implementation period for this subproject is around 3 years with a construction period of around 3 years. All FRP huts are expected to be completed by December 2017.

F. Technical Features:

53. Seismic resistant structure:
The FRP Structures will comply with IS 13827:1993 for a seismic resistant structure.

S.No.	Requirements	Specifications
1	Structural Components and Material	Floor bases, Walls and Roofs: Hut (Types: Hemisphere in shape) to be installed at various sites of Uttarakhand Raw Material: The basic raw-material used for construction shall be : Fiber-glass reinforced with FR resin as per BS 3252 Type E and Phenolic Foam/ Polyurethane Foam, The composition for manufacturing Fiber-glass Dome Structure consists of unsaturated chemical vix. Gel Coat, resin, MEKP and high density Polyurethane foam as insulation, easy and fast to Fabricate, 100% water proof with anti-fungal, Very low maintenance cost. Good nail and screw holding power and good binding strength. The structures must have a smooth gelcoat finish on both interior and exterior.
		Size: a huts Diameter 20′-66″ b Central height 10′3″ c Area 330 sq.ft. d Ground clearance (Plinth lvl. from Ground lvl.) 10″ to 30″
	Doors	➢ 01 No. Fiber-glass insulated door provided for Entry 3′-6″ x 7′-0″ of size ➢ 1 no. Fiber-glass insulated door provided for Toilet of 2′-6″ x 7′-0″ size
	Windows	2 Nos. Sealed windows for light & cross ventilation
	Ventilators	01 No. for cross ventilation

	Flooring	• Standard FRP Insulation, floor of 2.5/-3.0// thickness • Good, strong, durable floor and anti-skid.
	Fastening	These shelters should be able to join together with means of MS Galv. Nuts and bolts through built-in flanges, without any external Support or super-structure. All material except nuts and bolts should be non-metallic to prevent rust and frost bites & also can be resist on high flood or any other climates.
	Loads	• Roof Load: 800 psi or better • Floor load: 2000 psi or better • Wind speed : 200 mph or better 200 mph
	Site works	Erection of Prefab huts at the site

Cost effectiveness:

53. The Area is prone to floods, cloud bursts and other natural calamities. The area is also cold and for many places there is no road connecting the site. The conventional shelters need time, water, labor, regular supply of raw material etc. In such a state FRP shelters are suitable due to following reasons:

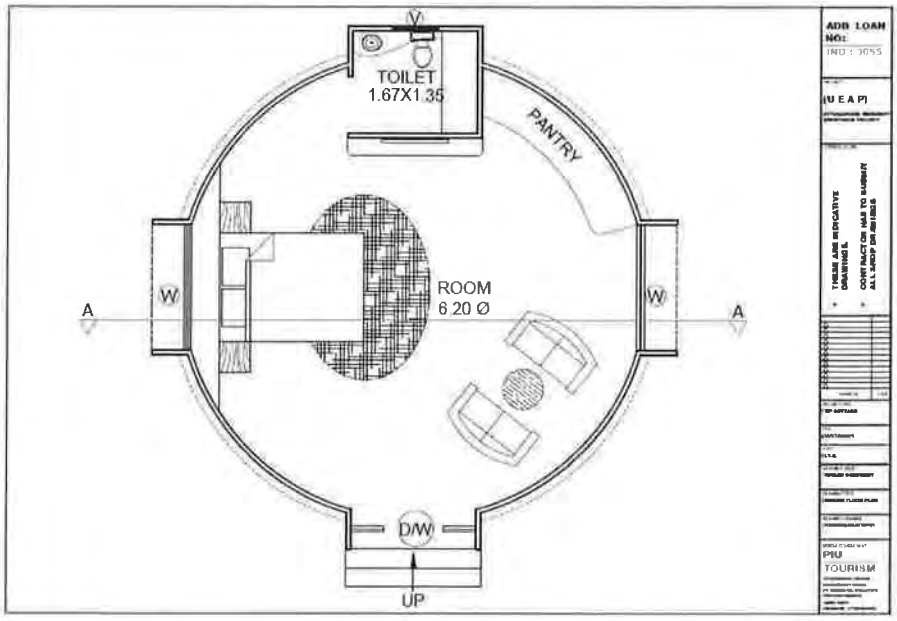
- The panels are light weight and can be erected quickly on the site.
- No maintenance is required for the upkeep of FRP/HYBRID structures.
- The "Dome" shaped FRP can withstand high pressure (8000 psi), doesn't get spoilt in water/acids/alkali. These shelters don't need any maintenance as well, like painting seepage etc.
- The FRP shelters can easily be moved in cases of emergency. The light panels (<50 kg.) can easily be transported by men or helicopters. Testing standards:
- 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).

G). Raising design and construction standards:

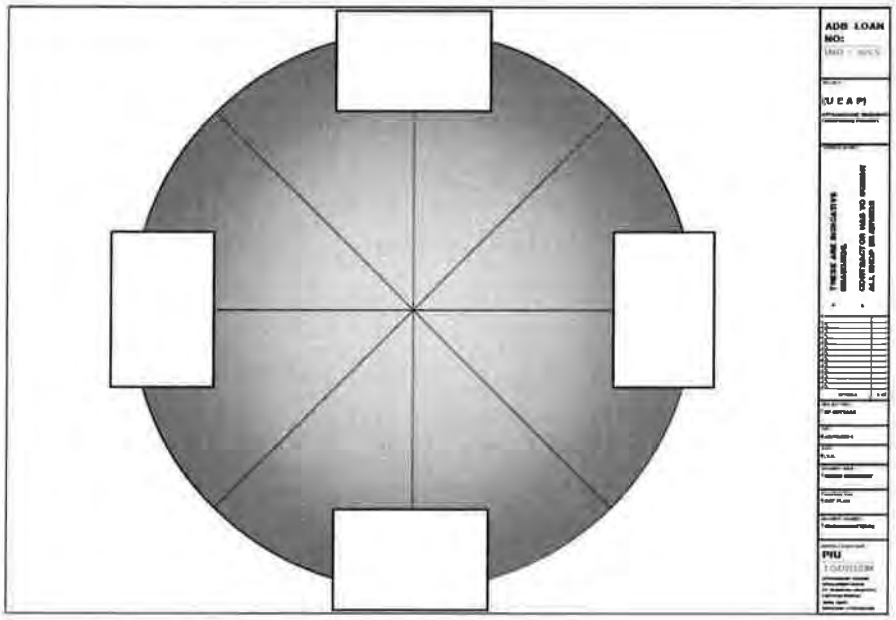
As above Point No. A & B

H). Drawings

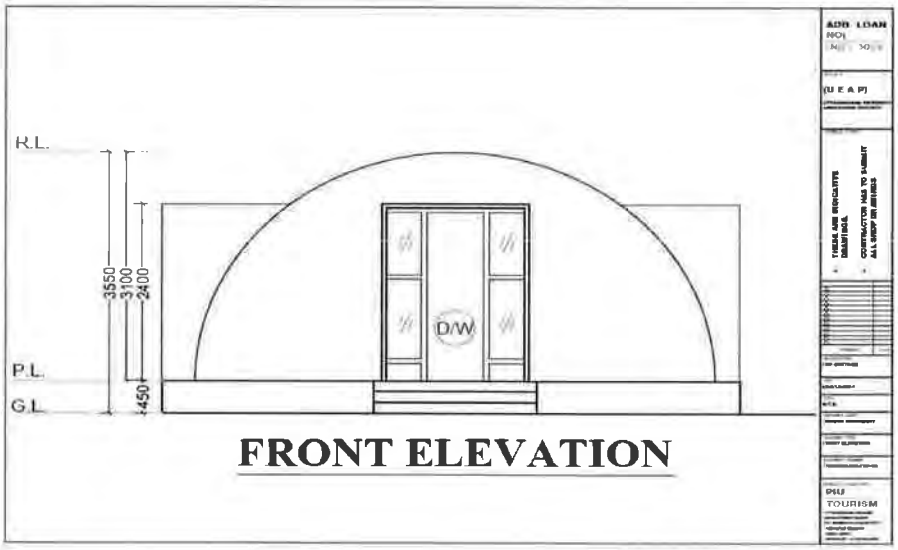
(i) Hut Floor Plan

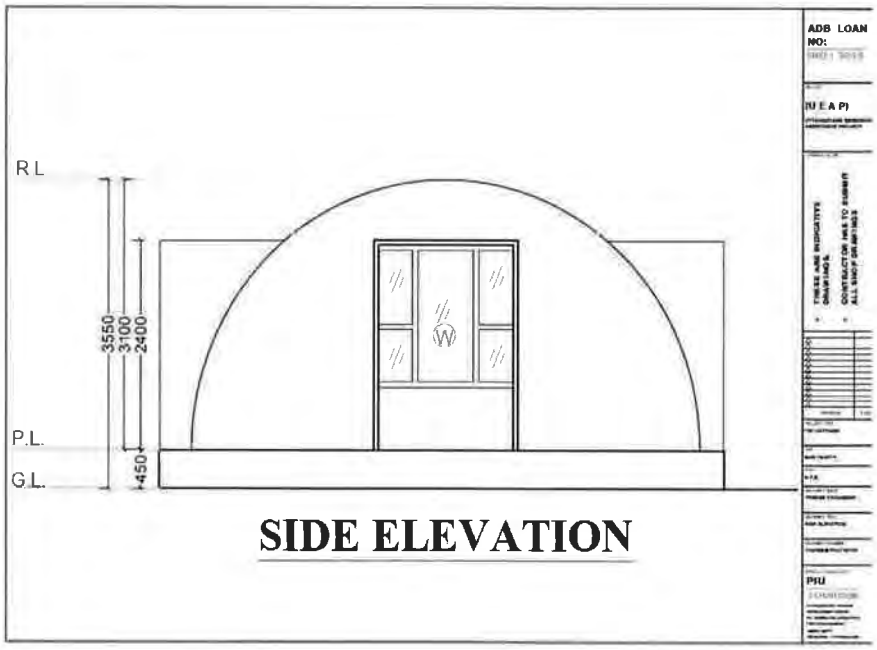


(ii) Hut Roof Plan

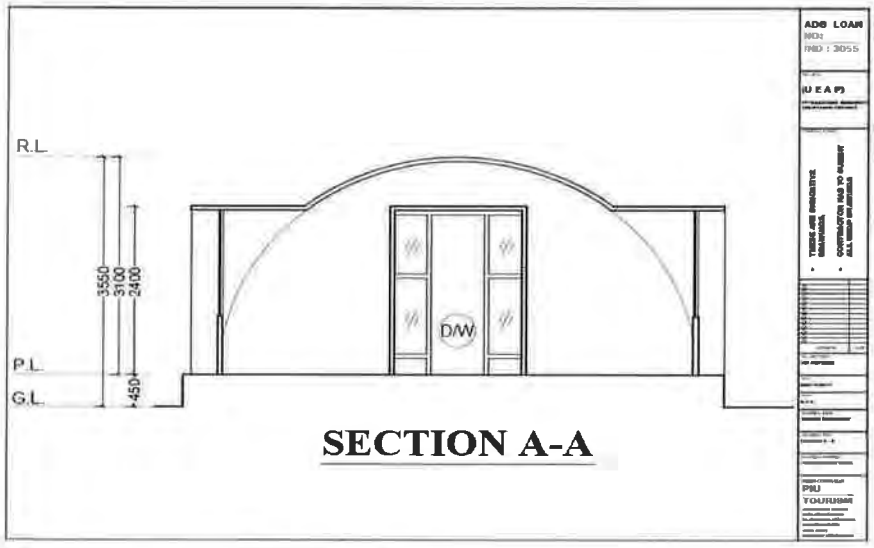


(iii)Elevation Plan





Section Plan



IV. DESCRIPTION OF THE EXISTING ENVIRONMENT

Environmental Profile – Uttarakhand

55. Uttarakhand is the newly formed hill state in the Indian Himalayan Region which became a separate state, carved out of hill districts and sub Himalayan regions of Uttar Pradesh in the year 2000. The geographical location (28°43' N to 31°27' N and 77°34' E to 81°02' E) resource setting of Uttarakhand is unique and shares its borders with China and Nepal. It borders the Tibet Autonomous Region on the north, Nepal on the east and the Indian states of Uttar Pradesh to the south, Haryana to the west and Himachal Pradesh to the North West. There are 13 districts in Uttarakhand which are grouped into two divisions: Kumaon division and Garhwal division. Uttarakhand has a total geographic area of 53,483 km², of which 93% is mountainous and 64.79% is covered by forest. Most of the northern parts of the state are part of Greater Himalaya ranges, covered by the high Himalayan peaks and glaciers, while the lower foothills are densely forested. The difference in altitude between the lowest parts and the highest part (snow peaks of Nandadevi) is almost 7,000 meters.

A. Physical Environment

i. Geography

56. 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, these are; Pithoragarh, Almora, Nainital, Pithoragarh, Champawat, Uttarkashi, Udham Singh Nagar, Chamoli, Dehradun, Pauri, Tehri Garhwal, Rudraprayag, and Haridwar. Geographically, the state lies in the northern Himalayas between 28°53'24" to 31°27'50" North latitude and 77°34'27" to 81°02'22" East longitude. The State has an area of 53,484 sq. km. and a population of about 1.01 crore as per census 2011.

Figure IV-1 Districts of Uttarakhand

57. All the project sites lies within district Pithoragarh which is the eastern-most district in the state of Uttarakhand. It is naturally landscaped with high Himalayan mountains, snow-capped peaks, passes, valleys, alpine meadows, Forests, waterfalls, perennial rivers, glaciers, and springs. The flora and fauna of the area have rich ecological diversity. Pithoragarh town is the district headquarters, which gives its name to the district and located at a height of 1645 meters above sea level. The district forms the north-eastern part of the Kumaon Division and lies between Lat. $29^0 27'$ N. and $30^0 49'$N. and Long. $79^0 50'$ E. and $81^0 3'$ E., the length from north to south, being about 151 Km. at its maximum, and the breadth from east to west, reaching its maximum at about 119 Km. It is bounded by Tibet on the north, Nepal on the east, district Almora on the south and the districts Almora and Chamoli on the west. River Kali forms a continuous border with Nepal in the east. The altitude of the district varies from 1200 m to 4500 m above MSL. The slope of the district varies from very steep slope to steep slope (>600m/km to 150-300m/km).

58. The geographical area of the district is 7,250.0 km^2. The total population of the district was 485,993 as per the 2011 census and literacy rate was 82.93 percent. The Hindu pilgrimage route for Mount Kailash-Lake Mansarovar passes through this district via Lipulekh Pass in the greater Himalayas. The district is administratively divided into five tehsils: Munsyari; Dharchula; Didihat; Gangolihat; and Pithoragarh. Out of 16 sites FRP sites, 9 sites are located in Pithoragarh tehsil and rest 7 sites are located in tehsil Munsyari.

59. Pithoragarh has a lot of historical importance. It was one of the main centre of power during the Chand dynasty of Kumoan. Pithoragarh was for the whole of the remaining 14th century ruled by three generations of Pals. The kingdom extended from Pithoragarh to Askot. During the reign of the Chand Rajas of Kumaon, one Piru, also called Prithvi Gosain, built a fort here and named it Prithvigarh which, in course of time, got changed into Pithoragarh. After the Chand's period, British have ruled over the region. In 1815, the British rule came in existence when they made Sugoli Treaty with Nepal. According to this treaty, Nepal has to give Himanchal to India. Under the British rule, Pithoragarh remained a tehsil under Almora district until it was elevated to a district in 1997. In 1997, part of Pithoragarh district was separated to form the new Champawat district by the Uttar Pradesh Government.

iii Geology

60. The proposed FRP sites in district Pithoragarh are located in Kaliganga, Darma and Goriganga valleys. The project area is composed of two high-grade metamorphic gneiss sheets *i.e.* the Higher Himalayan Crystalline (HHC) and Lesser Himalayan Crystalline (LHC) zones. These were tectonically extruded as a consequence of the southward directed propagation of crustal deformation in the Indian plate margin. The HHC and its

cover rocks i.e. the Tethyan Sedimentary Zone (TSZ) are exposed through tectonic zones within the hinterland of Kumaon Himalaya. The Central Crystallines of the Central Himalayan Zone occur as thrust sheets over the metasedimentary and sedimentary rocks of Lesser Himalayan Zone in varied tectonic settings.

61. The area shows an extremely rugged topography characterized by precipitous hills and deep gorges with sharp variation of high magnitude in surface relief. The general slope is towards south. In the northern parts the elevation of the land surface ranges from about 3000 m to 6861 m above mean sea level whereas in the valleys of southern part, the altitude is as low as 795 m.

62. Main Central Crystalline belt in the project area consists of Mylonite gneisses, phyllites, garnetiferous schist, calc, silicate rock and quartzites with associated migmatite syntectnonic granite gneisses and late to post tectonic tourmaline granite. The main structural discontinuities running through the entire length of Uttarakhand is on the Main Central Thrust (MCT) which is locally referred as the Munisiari Thrust. This thrust has brought the Central Crystallines in juxtaposition with rocks of low-grade complexes (lesser Himalaya belt of rock), which in a sense marks southern boundary of lesser Himalayas. Apart from the regional thrust following the Himalaya trends, a number of faults of transverse disposition dissects and displace the rock gneiss.

iii. Physiography

63. The project area is located in the inner part of lesser Himalayas and outer part of Great Central Himalayas. It represents an extremely rugged topography with very high relief. The area is drained by a number of streams (gads) which are tributaries of southerly flowing river Goriganga which itself is a tributary of Kali river (River Sarda).

64. Pithoragarh district comprises of one broad physiographic divisions from north to south viz. Central Himalayan Zone (north of the Main Central Thrust) and Lesser Himalayan Zone (south of the Main Central Thrust).

B. Pedology

65. The detailed geological studies shows that the rocks in the area is made up of low grade metamorphic rocks of the Munsyari Formation and the higher grade metamorphosis of Vertika Formation. Major rock types of Central Crystallines are migmatites, psammitic and mica gneiss, calc gneiss, quartzite, marble, mica schist and amphibolite. Granites of different ages ranging from Paleoproterozoic to Mesozoic-Tertiary intrude the Central Crystallines. Rock types in the Lesser Himalayan Zone include sedimentaries, metasedimentaries and plutonic igneous rocks. The various rock units have suffered multiple phases of deformation and metamorphism in major parts of the district.

66. The soils of Pithoragarh district can be broadly classified into two types, viz. Soils of Lesser Himalaya and Soils of Greater or Central Himalaya. Majority of the area is covered by the first type. The soils in this area are exposed in massive mountainous tracts and tangled mass of series of ridges divided from each other by deep, narrow valleys. The most predominant soil associations in these areas are red loams and brown forest soils. The other types are found only under variations of micro topography. Meadow soils occur only in depressionary pockets in valleys resulting from the accumulation of finer materials and the removal of soil humus caused by rains from the surrounding hill ranges. Soils associated with higher elevations are highly depleted of fine fractions and contain 42 percent gravel. On the other hand, the soils associated with lower elevations (e.g. valleys) contain only 21 percent gravel. Soils associated with pastures and forests (e.g. open for grazing) seem to be highly depleted of fine soil formation. The soil depth is mostly shallow to very shallow.

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

68. The proposed locations of soil quality monitoring at pre construction stage (baseline data) as per CPCB guideline are as follows:

S. No.	Name of the Sub Project	No. of Samples	Sampling locations
1.	Pangu	1	Panchu Yatra camp
2.	Sirkha	1	Sirkha camp
3.	Gala	1	Gala camp
4.	Malpa	1	Malpa Yatra camp
5.	Budhi	1	Budhi camp
6.	Gunji	1	Gunji Yatra camp
7.	Kalapani	1	Kalapani Yatra camp
8.	Nabidhang	1	Nabidhang Yatra camp
9.	Kutti	1	Kutti camp
10.	Sela	1	Sela
11.	Mangti	1	Mangti
12.	Baling	1	Baling
13.	Lilam	1	Lilam
14.	Martoli	1	Martoli
15.	Panchu	1	Panchu
16.	Burfu	1	Burfu

C. Climate and Meterology

69. The climate of Uttarakhand is sharply demarcated in case of its two distinct divisions: the predominant hilly terrain and the smaller plain region. The climate in the northern part of Uttarakhand is typically Himalayan. This mountain range itself exerts an appreciable extent

of influence on monsoon and rainfall patterns. Within the Himalayas, climate differs depending on altitude and position. Climate ranges from subtropical in the southern foothills, averaging summer temperatures of about 30°C and winter temperatures of about 18°C. Warm temperate conditions prevail in the Middle Himalayan valleys, with summer temperatures usually hovering about the mark of 25° C and cooler winters. Cool temperate conditions dominate the higher areas of the Middle Himalayas, where the summer temperatures are usually around 15 to 18°C and winters drop below the freezing point. At altitudes over 4,880 m (16,000 feet), the climate is bitterly cold with temperatures consistently below the freezing point and the area perennially shrouded in snow and ice. The eastern flanks of the Himalayan ranges are subject to heavy rainfall while the western section is relatively dry.

70. The elevation of the district ranges from 500 meter in the valleys in the south to over 7000 meter in the snow-bound Himalayas in the north and north-west. The climate, therefore, largely depends on altitude and varies according to aspect and elevation. Although tropical beat may be experienced in the southern valleys during the summer, the winters are severe. As most of the district is situated on the southern slopes of the Himalayas, monsoon currents penetrate through the deep valleys and rainfall is at the maximum in the monsoon season (June to September), particularly in the southern half of the district. The northern half of the district also gets considerable rain during the winter season which lasts from mid-November to March.

i Rainfall

71. Records of rainfall in the district are available for eight rain recording stations which, however, are so located that the records are more properly representative of rainfall in the river valleys. Most of it occurs during the monsoon period, being between 75 per cent and 85 per cent of the annual precipitation in the south and between 50 per cent and 70 per cent in the extreme north and north-east. July and August are the rainiest months. In September depressions from the Bay of Bengal occasionally affect the weather and, in association with them, heavy rain may occur causing floods. In the monsoon season there are a few occasions when there are spurts of heavy rain in the hills causing floods in the rivers. The rainfall decreases rapidly after September and is the lowest in November. During winter, from December to March, considerable precipitation occurs in association with the passage of western disturbances across the region, particularly in the northern parts where it is considerably higher than in the rest of the district, being about 20 per cent of the annual total.

ii Temperature.

72. January is the coldest month with mean maximum temperature of 10°C, the mean minimum temperature being about 2°C. Temperature drops down to –6°C during January and February in the northern part of the district. June is the warmest month with the mean maximum and the mean minimum temperatures of 25°C and 15°C respectively. The

maximum temperature recorded in the district was 38°C (May 2003) whereas the minimum temperature recorded was -8.0°C (January 2003).

iii Humidity

73. The Relative Humidity increases rapidly with the onset of monsoon and reaches at about 80% during July to September. The driest part of the year is the pre-monsoon period, when the humidity is as low as 30% in the afternoons. Skies are heavily clouded during the monsoon months and for short spells when the district is affected by Western Disturbances. Two broad wind patterns are observed in the district viz. north easterly to easterly (May to September) and south easterly to westerly (October to March).

D. Ambient Air Quality and Noise Level.

74. The pristine environment and sparse population suggest that the area has a very good air quality. Any point or non-point pollution sources of air pollution were not observed throughout the survey period. It was observed that the traffic on the roads is too low to cause unbearable air pollution due to vehicular exhaust. Finally, there are no industries recorded in or along the subproject area and hence any other source of atmospheric air pollution is not expected. The air pollution level is well within the permissible limits because there are no major sources of pollution in the region. The baseline data on ambient air quality will be generated by the contractor before commencement of construction works. The proposed locations of air quality monitoring at pre construction stage (Baseline data) as per CPCB guideline are as follows:-

S. No.	Name of the Sub Project	No. of Samples	Sampling locations
1.	Pangu	1	Panchu Yatra camp
2.	Sirkha	1	Sirkha camp
3.	Gala	1	Gala camp
4.	Malpa	1	Malpa Yatra camp
5.	Budhi	1	Budhi camp
6.	Gunji	1	Gunji Yatra camp
7.	Kalapani	1	Kalapani Yatra camp
8.	Nabidhang	1	Nabidhang Yatra camp
9.	Kutti	1	Kutti camp
10.	Sela	1	Sela
11.	Mangti	1	Mangti
12.	Baling	1	Baling
13.	Lilam	1	Lilam
14.	Martoli	1	Martoli
15.	Panchu	1	Panchu
16.	Burfu	1	Burfu

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

Ambient Noise Level

76. Noise above a certain level can have a very disturbing effect on the people and animals exposed to it. Hence, it is important to assess the present noise level of the area in order to predict the potential impacts of future noise levels due to this project in the construction as well as operation phases. In the preliminary survey it was observed that the noise pollution level is well within the permissible limits.

77. The baseline data on ambient noise level will be generated by the contractor before commencement of construction works. The proposed locations of noise quality monitoring at pre construction stage (Baseline data) as per CPCB guideline are as follows:-

S. No.	Name of the Sub Project	No. of Samples	Sampling Locations
1.	Pangu	1	Panchu Yatra camp
2.	Sirkha	1	Sirkha camp
3.	Gala	1	Gala camp
4.	Malpa	1	Malpa Yatra camp
5.	Budhi	1	Budhi camp
6.	Gunji	1	Gunji Yatra camp
7.	Kalapani	1	Kalapani Yatra camp
8.	Nabidhang	1	Nabidhang Yatra camp
9.	Kutti	1	Kutti camp
10.	Sela	1	Sela
11.	Mangti	1	Mangti
12.	Baling	1	Baling
13.	Lilam	1	Lilam
14.	Martoli	1	Martoli
15.	Panchu	1	Panchu
16.	Burfu	1	Burfu

E. Hydrology

i. Water Drainage

78. Drainage of the area is mainly controlled by Kali (Sharda) river and its tributaries i.e. Gori, Dhauli, Sarju, N. Ramganga (E) and their sub tributaries. These rivers are primarily fed by snowmelt with relatively smaller contribution from ground water. However, during the lean period, the rivers are fed by ground water occurring as base flow.

Table IV.1: Average annual surface flow of the rivers of district Pithoragarh.

Rivers	Av. Annual flow (Milliard m3)	Discharge recorded at	Source region
Dhauli	2.6	Nyu	Greater Himalaya
Gori	3.8	Bangapani	Greater Himalaya
Ramganga (E)	3.1	Thal	Greater Himalaya

Sarju	5.8	Shera	Greater Himalaya
Kali	5.8	Shera	Greater Himalaya

Groundwater

79. Ground water, in general, occurs locally within disconnected bodies under favourable geohydrological conditions such as in channel and alluvial terraces of river valleys, joints, fractures and fissures of crystalline and meta-sedimentary rocks, well vegetated and relatively plain areas of valley regions and in subterranean caverns of limestone and dolomitic limestone country rocks. The occurrence and movement of ground water depend not only on the nature of the litho units and the nature of the interspaces/interstices, but also on the degree of interconnection between them, the vertical and aerial extension of joints, faults and/or shear zones and the local and regional geomorphology. Ground water emerges as springs and seepage (locally called *Srots* and *Naolas*) under favourable physiographic conditions such as in gently sloping areas, broad valleys of rivers and along the lithological contacts.

80. Rainfall is the principal source of ground water replenishment. Out of the total annual rainfall (1852.7 mm), the southern and central parts of the district receive considerable amount of precipitation. A part of the precipitation is lost into the atmosphere as evaporation and evapo-transpiration from soils and plants, another considerable part flows as surface run off due to extremely rugged and undulating topography with steep slope and the remaining part directly infiltrates through the soil profile to form the ground water storage in joints, fractures, fissures etc. In hilly areas, ground water flows out as springs and seepage where the water table intersects the ground surface.

ii Water Quality

81. All the FRP sites are located in the high hilly area away from surface water bodies as such there will be no case of water pollution due to construction and operation of proposed subproject. The only sources of water in these areas are rivulets, and other natural water sources are generally good and no major source of water pollution was found. Natural water seeping out from mountains locally called as "*Naula*", and natural water springs locally called as "*Gadhera*" 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 in streams. The baseline data on water quality will be generated by collection of representative samples by the contractor before the commencement of construction activity.

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

S. No.	Name of the Sub Project	No. of Samples	Sampling Locations
1.	Pangu	1	Nearest water source at Panchu Yatra camp

2.	Sirkha	1	Nearest water source at Sirkha camp
3.	Gala	1	Nearest water source at Gala camp
4.	Malpa	1	Nearest water source at Malpa Yatra camp
5.	Budhi	1	Nearest water soiurve Budhi camp
6.	Gunji	1	Nearest water source Gunji Yatra camp
7.	Kalapani	1	Nearest water source Kalapani Yatra camp
8.	Nabidhang	1	Nearest water source at Nabidhang Yatra camp
9.	Kutti	1	Nearest water source at Kutti camp
10.	Sela	1	Nearest water source at Sela
11.	Mangti	1	Nearest water source at Mangti
12.	Baling	1	Nearest water source at Baling
13.	Lilam	1	Nearest water source at Lilam
14.	Martoli	1	Nearest water source Martoli
15.	Panchu	1	Nearest water source at Panchu
16.	Burfu	1	Nearest water source at Burfu

F. Mineral Resources

83. 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.

84. A number of minerals are found in the district, and brief details of these minerals area given as under:-

Copper—The region around the town of Pithoragarh has been one of the Important centres of copper mining in the past. The remnants of old copper mines which collapsed long ago are found at Agar Barabisi and south of Askot. Such a mine is also reported to have existed below Pithoragarh town where there in now a natural spring, of which the water has a metallic taste. These mines were abandoned due to the poor quality of ore and difficult mining conditions. Copper ore is found to occur as disseminations in crystalline dolomites and as segregations in quartz veins traversing the former. Chalcopyrite, tetrahydrite, cuprite and malachite are said to have been found in the mine. South of village Ascot malachite is commonly found staining the country rock, which is also traversed by quartz veins bearing galena, pyrite, arsenopyrite and chalcopyrite, Chalcopyrite specks and clusters up to 4 cm. in length have been found at Bora-Agar in a band of crystalline dolomite extending for about 1,209 m. Associated minerals are cuprite, tetrahydrite and malachite and azurite, disseminated in quartz stringers and also in crystalline dolomite, occurs near Dewal Thal.

Magnesite—Several scattered deposits of magnesite are found in the area around Pithoragarh. They are associated with the dolomite limestone. Very little work has been done on these deposits. Extensive deposits of the mineral occur at several scattered localities in the neighborhood of Dewal Thal. Some of the more promising

ones being located at Dewal Thal, Chandag, Phadyari and Satsilang. Other promising deposits occur at Osail, Bevalthal, Harali, Pathrauli, Ramkot, Bunga Chhina and Masum Bheo. Between Tong and Dhurai in Rani Agar occur two promising zones of crystalline magnesite which extend for almost a kilometre. The deposits in the northern zone are about 23 m. and in the southern about 60 meter in thickness.

Soapstone—Several small deposits of soapstone occur in association with magnesite at Dewal Thal and Chandag.

Arsenic—Orpiment deposits exist near Munsyari. Both orpiment and realgar are reported to be available in scattered fragments on the moraines of the Shunkalpa glacier. The ore had probably come down from the hill face immediately above.

Sulphur—This mineral is found in the bed of the Ramganga (eastern) and in tahsil Munsyari.

Kyanite—At Girgaon (south of Malpa) there is a thin layer of blue scaly kyanite, the rocks also bearing sericite quartzite.

Graphite—Graphitoid pigmentation in schistose rocks is found near villages Sobala and Dar in the Dhauli valley and north of Sirdang in the Kali valley.

Slate—Slate quarries exist throughout the district and it is utilized locally for building purposes.

Limestone—Though vast reserves of limestone exist in the district, they are dolomite and appear to be fit only for ballast.

G. Seismology

85. The entire state is prone to earthquake hazards which are expected in the two highest seismic zones, IV and V, as per the seismic zoning map of India (BIS: 1983-2002). Out of 13 districts in Uttarakhand large parts of 11 districts have PGA (Peak Ground Acceleration) values above 0.4g, which indicates a very high level of seismic hazard. This includes Almora, Pithoragarh, Chamoli, Champawat, Dehra Dun, Nainital, Pauri, Pithoragarh, Rudraprayag, Tehri and Uttarkashi districts. Only two districts, Haridwar and Udham Singh Nagar, south of the MBT, show accelerations below 0.3g. These phenomena often result in adverse consequences such as damage to the built environment and loss of life and injuries. The proposed structures have been designed in view of the threats due to seismic hazard as the sub project lie in the seismic zone VI and V.

H. ECOLOGY

i. Forestry

86. According to The India State of Forest report 2013, the recorded forest area of the Uttarakhand state is 34,651 km2 which constitutes 64.79% of its geographical area. Reserve forests constitute 24,643 sq km Protected Forests 9,885 sq km and Unclassed Forests constitute 123 sq km of the total forest area.

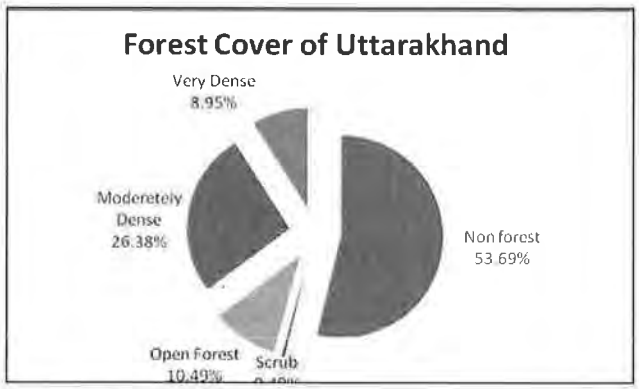


Figure IV-3 Forest Cover by State, 2013.

87. The distribution of forest cover by district is presented in the succeeding Figure and Table. The Garhwal region has more forest cover with 14,639 km^2 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

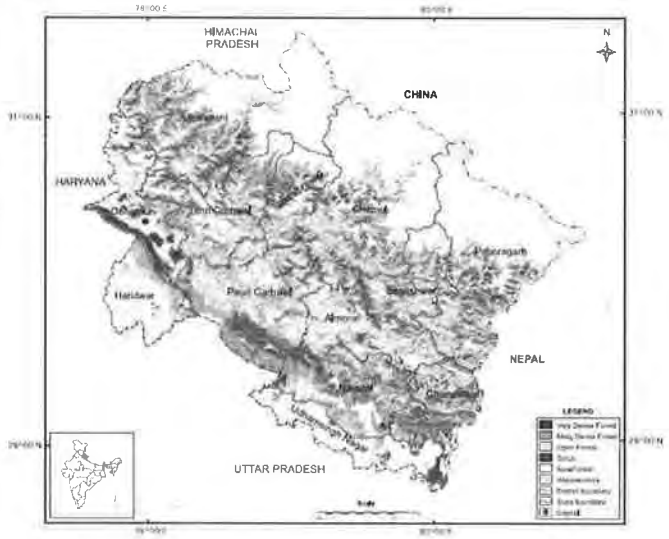


Figure 0-4: Uttarakhand's Forest Cover Map

Table VI-2. District-wise Forest Cover, Uttarakhand

(Area in km^2)

Region	District	Geographic Area	Forest Cover 2013 Assessment			Total Forest	% ofGA
			Very Dense	Moderate Dense	Open Forest		
Garhwal	Uttarkashi	8,016	570	1957	618	3145	39.23
	Rudraprayag	1,984	241	592	297	1130	56.96
	Chamoli	8,030	441	1,573	686	2700	33.62
	Pauri Garhwal	5,329	520	2,095	676	3291	61.76
	Tehri Garhwal	3,642	298	1,232	618	2148	58.98
	Dehradun	3,088	583	695	332	1610	52.14
	Haridwar	2,360	25	333	257	615	26.06

Sub-Total		**32,449**	**2,678**	**8,477**	**3,484**	**14,639**	
Kumaon	Pithoragarh	7,090	571	1,113	416	2100	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	1899	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**	
Grand 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: India State of Forest Report 2013

88. 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.

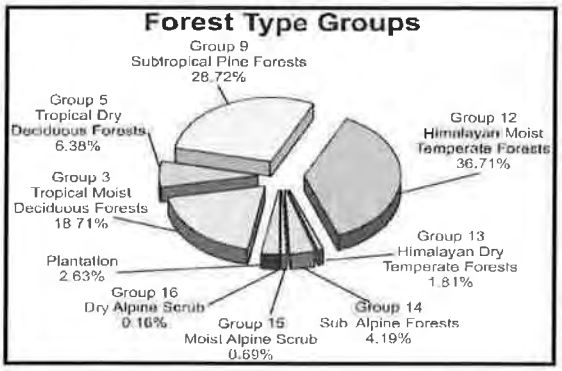


Figure IV-5. Forest type groups of Uttarakhand

89. 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 setylized 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) asource of resin, which is used for producing resin and terpentine.

Table IV-3. Predominant Top-Canopy (Tree) Species According to Altitude

Sl. No.	Common Name	English Name	Botanical Name	Altitude (m.)
1.	Kachnar	Orchid tree	*Bauhinia variegata*	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

Source: Uttarakhand forest Department website (http://forest.uk.gov.in/files/sTATISTICS_2013/Uttarakhand_Statistics_2013.pdf)

ii Biodiversity

Floral diversity

90. The floristic analysis of Angiosperm and Gymnosperm in Uttarakhand reveals that there are about 4,048 species belonging to 1,198 genera under 192 families. The floristic diversity reveals that the state harbors 4,000 species of vascular plants of which nearly 116 species are endemic to Uttarakhand as they have confined their distribution to the state. The state has 500 algal species, 751 species of mosses, 18 endemic species of pteridophyta, 435 species of lichens. (Singh and Singh 1992)[1]

91. A total number of 135 species of plant are abundant in the sub project area, out of which 46 species are of trees, 23 species are of shrubs, 50 species are of herbs, 10 ferns and 6 species belongs to Broyophytes (Garyal, 2005)[2]. A detailed list of plant species found in the study area is given in Table IV.4.

[1] J.S. Singh and S.P. Singh (1992) Forests of Himalaya (Nainital, Gyanodaya Prakashan

[2] Garbyal, S.S. (2005). TRADITIONAL knowledge of PLANT resources in Dharchula region: Biotechnological Potential, Conservation and Management Strategies, Thesis submitted to Guru Gobind Singh Indraprastha University, New Delhi

Table IV.4: List of Tree species observed in the study area

S.No	Botanical Name	Local Name
TREES		
1.	*Acer caesium*	Kanchula
2.	*Abies spectabilis*	Raga
3.	*Aesandra butyracea*	Chiura
4.	*Aesculus indica*	Pangar
5.	*Aesculus indica*	Cypress/Surai
6.	*Alnus nepalensis*	Utees
7.	*Betula alnoides*	Saur
8.	*Betula utilis*	Bhojpatra
9.	*Carpinus viminea*	Putli
10.	*Cedrus deodara*	Cedre tree
11.	*Cedrella toona*	Tun
12.	*Celtis australis*	Kharik
13.	*Cinnamomum tamala*	Dalchini, Tejpat
14.	*Cornus capiltata*	Strawberry tree
15.	Cupress torulosa	Spruss
16.	*Dalbergia sissoo*	Sisham
17.	*Dandroclamus strictus*	Bans
18.	*Ehretia laevis*	Chamror
19.	*Erythriana arborescens*	Dhauldhak
20.	*Ficus glomerata*	Gular
21.	*Ficus hispida*	Totmila
22.	*Ficus palmata*	Bedu / Anjir
23.	*Fraxinus micrantha*	Himalayan Ash
24.	*Ilex excelsa*	Gauloo
25.	*Juglans regia*	Akhrot
26.	*Litsea glutinosa*	Singrau/Maida lakri
27.	*Myrica esculenta*	Kaphal
28.	*Phoenix sylvestris*	Khajoor
29.	*Pinus wallichiana*	Kail
30.	*Pinus roxburghii*	Chir
31.	*Pterocarpus marsupium*	Bija Sal
32.	*Pyrus pashia*	Mehal
33.	*Quercus leucotrichophora*	Banj
34.	*Quercus semecarpifolia*	Kharsu
35.	*Quercus floribunda*	Chirla
36.	*Rhododendron arboreum*	Rosewood/ Burans
37.	*Rhododendron campanulatum*	Rosewood/ Semru
38.	*Rhus japonica*	Beshmeel
39.	*Salix acutifolia*	Bhains
40.	*Sapindus mukorossi*	Reetha
41.	*Sapium insigne*	Khinna
42.	*Shorea robusta*	Sal tree
43.	*Sorbus aucuparia*	Mohli

44.	*Spondias pinnata*	Amra
45.	Taxus baccata	Thuner
46.	*Trewia nudiflora*	Gutel
SHRUBS		
1.	*Artemisia niligirica*	Kunuja
2.	*Argemone maxicana*	Mexican prickly poppy, Shialkanta
3.	*Arundinella nepalensis*	reed grass
4.	*Athyrium sp*	Fern
5.	*Berberis aristata*	Kingor
6.	*Euphorbia prolifera*	Asthma plant, Baridhudi, Budh ghas
7.	*Cannabis sativa*	Bhang
8.	*Daphne papyracea*	Indian Paper Plant
9.	*Desmodium gangeticum*	Sal Leaved Desmodium, Dhurva
10.	*Duchesnea indica*	Indian Strawberry
11.	*Indigofera heterantha*	Saknya
12.	*Mahonia sp.*	Mahonia
13.	*Myrsine africana*	Cape Myrtle
14.	*Nerium sp.*	Kaner
15.	*Pyracantha crenulata*	Phunli
16.	*Polystichum sp.*	Common Shield Fer
17.	*Pteridium sp*	Eagle fern
18.	*Pteris sp.*	Fern
19.	*Pyracantha crenulata*	Himalayan firethorn
20.	*Rubus biflorus*	Kala Hissar
21.	*Rubus ellipticus*	Hinsal
22.	*Thamnocalamus spathiforus*	Kandali
23.	*Urtica dioca*	
HERBS		
1.	*Acorus calamus*	Bauj, Bach
2.	*Agrostis nervosa*	
3.	*Anaphalis adnata*	Bugla
4.	*Anemone vitifolia*	Mudeela
5.	*Apium leptophyllum*	
6.	*Arabidopsis himalaica*	
7.	*Arabidopsis thaliana*	
8.	*Artemisia japonica*	Patee, Pamsi
9.	*Artemisia nilagirica*	
10.	*Bergenia ciliata*	Silpara, *Pashan bedh*
11.	*Bistorta amplexicaulis*	Kutrya
12.	*Centella asiatica*	Brahmibuti
13.	*Clematis tibatiana*	
14.	*Convolvulus arvensis*	Deer's foot
15.	*Corallodiscus lanuginosus*	
16.	*Curcuma aromatica*	Ban Haldi
17.	*Cymbopogon flexuosus*	Himalayan Lemon grass

18.	*Cymbopogon msrtinii*	Priya-ghas
19.	*Cynodon dactylon*	Dubla,
20.	*Cynoglossum glochidiatum*	Indian Hound's tongue
21.	*Didymocarpus pedicellata*	
22.	*Echinops cornigerus*	Kantela
23.	*Eulaliopsis bineta*	Babula
24.	*Geranium nepalense*	Neap Geranium
25.	*Geranium wallichianum*	Robert Geranium
26.	*Heracleum canescens*	Hogweed
27.	*Hydrocotyle nepalensis*	Penny wort
28.	*Impatiens balsamina*	Balsa weed
29.	*Iris kumaonensis*	
30.	*Meconopsis aculeata*	Royal Himalayan Poppy
31.	*Meconopsis paniculata*	Himalayan yellow Poppy
32.	*Oxalis corniculata*	
33.	*Persicaria hydropiper*	Water pepper
34.	*Plantago depressa*	Plantain
35.	*Potentilla fulgens*	Vajradantii
36.	*Polygonum glabrum*	Phyaktuli
37.	*Polygonum recumbens*	
38.	*Reinwardtia indica* r	Phiunli
39.	*Rumes nepalensis*	Khatura
40.	*Rumex nepalensis*	
41.	*Solanum nigrum*	Makoi
42.	*Stephania glabra*	Gindadu
43.	*Tanacetum dolichophyllum*	Long leaved Tansy
44.	*Themeda anathera*	Golda
45.	*Thespesia lampas*	Jangli Bhindi
46.	*Trifolium repens*	White clover
47.	*Torilis leptophylla*	
48.	*Verbascum thapsus*	Asron's Rod,Cow's Lungwort
49.	*Vilo biflora* L	Vanafsa
50.	*Withania somnifera*	Ashwa gandha
FERN		
1.	*Adiantum capillus-veneris*	
2.	*Adiantum edgeworthii*	
3.	*Deparia allantodioides*	
4.	*Araiostegia beddomei*	
5.	*Microlepia dubia*	
6.	*Sphenomeris chinensis*	
7.	*Cyrtomium caryotedium*	
8.	*Polystichum discretum*	
9.	*Elaphoglossum stelligerum*	
10.	*Hypodematium crenatum*	
BRAYOPHYTES		

1.	*Anomobryum filiforme*	
2.	*Blepharostoma trichophyllium*	
3.	*Dicranella heteromalla*	
4.	*Grimmia alpicola*	
5.	*Herbertus* sp	
6.	*Pogonatum aloides*	

Source: *Management Plan of Pithoragarh Forest Division 2011-22, Forest Department of Uttarakhand.*
Garbyal, S.S. (2005). TRADITIONAL knowledge of PLANT resources in Dharchula region: Biotechnological Potential, Conservation and Management Strategies, Thesis submitted to Guru Gobind Singh Indraprastha University, New Delhi

Faunal diversity

92. Uttarakhand is home for many species of birds, mammals, reptiles as also for the threatened and endemic species. An annotated list of 2,248 species of animals, including 1,405 invertebrates species and 843 vertebrates species have been reported (Uttarakhand Biodiversity Board)[3]

93. During the survey and investigations a total number of 26 species of mammals from 14 families, 50 avian species from 20 families and 5 reptiles species were recorded in the project area. A detailed list of plant species found in the study area is given in Table IV.5.

Table IV.5:- Major faunal species reported in the project area and its surroundings

S.No.	Zoological Name	English Name Local	Common Name
MAMMALS			
Rodents			
Sciuridae			
1.	*Funambulus pennantii*	Five striped Palm Squirrel	Squirrel
2.	*Petaurista petaurista Pallas*	Giant Flying Squirrel	Squirrel
Muridae			
3.	*Alticola argentatus*	Mountain Vole	Dhurmoose
4.	*Bandicota indica Bechstein*	Greater Bandicoot Rat	
5.	*Marmota himalayana hodgson*	Himalayan Marmot	Fiya
Hystricidae			
6.	*Hystrix indica* Kerr	Indian Crested Porcupine	Sehi
Lagomorpha			
Muridae			
7.	*Alticola roylei*	Royle's mountain Vole	Dhurmoose
8.	*Marmota himalayana*	Himalayan Marmot	Fiya
Ochotonidae			
9.	*Ochotona roylei*	Royle's Pika	Gumchipichhi
10.	*Ochotona macrotis*	Large eared Pika	Dulymuse
11.	*Lepus nigricollis*	Indian hare	Khargosh

[3] Biodiversity of Uttarakhand, Report by Uttarakhand Biodiversity Board (http://sbb.uk.gov.in/files/ Publications/PDF%20Files/ Threatened_Species_Book-CTP.pdf)

Primata			
Cercopithecidae			
12.	*Macaca mulatto*	Rhesus Monkey	Banar
13.	*Semnopithecus entellus*	Hanuman Langur	Langoor
Artiodactyla–Eventoed Ungulates			
Bovidae			
14.	*Pseudois nayaur*	Blue Sheep	Bharad
15.	*Nemarhaedus ghural*	Goral	Gural
Suidae			
16.	*Sus scrofacristatus*	Wild Pig	Wild boar
Moschidae			
17.	*Moschus leucogaster*	Himalayan Musk deer	Kasturi mrag
Cervidae			
18.	*Muntiacus muntjak*	Barking Deer	Kakar
Perissodactyla – Odd toed Ungulates			
Equidae			
19.	*Equus kiang*	Tibetan Wild Ass	Kiyang
Carnivora			
Felidae			
20.	*Felis bengalensis*	Leopard cat	Ban Biralu
21.	*Felis chaus*	Jungle cat	Ban Biralu
22.	*Panthera pardus*	Leopard	Bagh
Canidae			
23.	*Canis a. indicus*	Golden jackal	
24.	*Canis lupus chanco*	Tibetan wolf	Changu
Ursidae			
25.	*Selenarctos thibetanus*	Himalayan Black Bear	Rikh
26.	*Ursus thibetanus*	Asiatic Black Bear	
BIRDS			
Phasianidae - Pheasants and partridges			
1.	*Alectoris chukar*	Chukar	Chakor
2.	*Arborophila torqueola*	*Hill Partidage*	Phyoonda
3.	*Catreus wallichii*	Cheer Pheasant	Chair
4.	*Francolinus francolinus*	Black Francolin	Black Titar
5.	*Ophrysia superciliosa*	*Himalayan Quail*	Quail,
6.	*Tetraogallus himalayensis*	Himalayan Snowcock	Himanl
Falconiidae and Accipitridae – Raptors			
7.	*Accipiter badius*	Shikra	Shikra
8.	Accipiter nisus	Eurasian Sparrow Hawk	
9.	*Aquila chrysaetos*	Golden Eagle	
10.	*Gyps himalayensis*	Himalayan Griffon	
11.	*Gyps indicus*	Long billed Vulture	
12.	*Neophron percnopterus*	Egyptian Vulture	
Columbidae - Pigeons&Doves			
13.	*Columba leuconota*	Snow Pigeon	

14.	*Streptopelia decaocto*	Eurasian Collared Dove	Fhakhta
15.	*Streptopelia orientalis*	Oriental Turtle Dove	Ghoghot
Cuculidae - Cuckoos			
16.	*Cuculus micropterus*	Indian Cuckoo	
Tytonidae and Strigidae - Owls			
17.	*Glaucidium cuculoides*	Asian Barred Owlet	
18.	*Otus spilocephalus*	Mountain Scops Owl	
Caprimulgidae - Nightjars			
19.	*Caprimulgus asiaticus*	Indian Nightjar	
20.	*Caprimulgus indicus*	Grey Nightjar	
Apodidae - Swifts & Needletails			
21.	*Collocalia fuciphaga*	Himalayan Swiftlet	
22.	*Tachymarptis melba*	Alpine Swift	
23.	*Zoonavena sylvatica*	White-rumped Needle tail	
Upupidae - Hoopoe			
24.	*Upupa epops*	Common Hoopoe	
Coraciidae - Rollers			
25.	*Coracias benghalensis*	Himalayan Roller	
Alcedinidae - Kingfishers			
26.	*Halcyon smyrnensis*	White throated Kingfisher	
27.	*Ceryle rudis*	Himalayan Kingfisher	
Meropidae - Bee eaters			
28.	*Merops leschenaulti*	Chestnut headed Bee eater	
Picidae - Woodpeckers			
29.	*Dendrocopos himalayensis*	Himalayan Woodpecker	
30.	*Dinopium shorii*	Himalayan Flameback	
Dicruridae - Drongos			
31.	*Dicrurus macrocercus*	Black Drongo	
Corvidae - Crows, Jays & Magpies			
32.	*Corvus macrorhynchos*	Large billed Crow	
33.	*Dendrocitta formosae*	Grey Treepie	
34.	*Urocissa erythrorhyncha*	Red Billed Blue Magpie	
35.	*Urocissa flavirostris*	Yellow billed Blue Magpie	
Pyconotidae - Bulbuls			
36.	*Hypsipetes leucocephalus*	Black Bulbul	
37.	*Pyconotus cafer*	Red Vented Bulbul	
38.	*Pyconotus leucogenys*	Himalayan Bulbul	
Cisticolidae - Prinias			
39.	*Orthotomus sutorius*	Common Tailorbird	
40.	*Prinia hodgsonii*	Grey breasted Prinia	
Sylviidae - Warblers			
41.	*Cettia brunnifrons*	Grey sided Bush Warbler	
42.	*Cettia major*	Chestnut crowned Bush Warbler	
43.	*Phylloscopus collybita*	Common Chiffchaff	
44.	*Phylloscopus magnirostris*	Large billed Leaf Warbler	
Timaliidae - Babblers			

45.	*Garrulax albogularis*	White Throated Laughing Thrush	
46.	*Turdoides striatus*	Jungle Babbler	
Sturnidae - Starlings&Mynas			
47.	*Acridotheres fuscus*	Jungle Myna	
48.	*Acridotheres tristis*	Common Myna	
Passeridae - Sparrows			
49.	*Passer domesticus*	House Sparrow	
50.	*Passer rutilens*	Russet Sparrow	
REPTILES			
1.	*Agama tuberculata*	Common lizard	Chhipkali
2.	*Agama tuberculata*	Rock lizard	Rock Lizard
3.	*Calotes versicolor*	Indian Garden Lizard	Normal Lizard
4.	*Japalura major*	Garhwal mountain lizard	Lizard
5.	*Varanus bengalensis*	Indian monitor lizard	Goh

Source: *Management Plan of Pithoragarh Forest Division 2011-22, Forest Department of Uttarakhand.*

3. Protected Area

94. The State of Uttarakhand is endowed with rich bio-diversity as manifested by its approximately 64 percent forest cover. 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 16 Protected Areas (PA) and a biosphere reserve in the State. Protected area has included six national parks, seven wildlife sanctuaries and three conservation reserve for the conservation of flora and fauna

Table IV.6:- Protected areas in Uttarakhand

S.No.	National Park	Year of Establishment	Area (m^2)	District
1.	Corbett NP	1936	520.82	Nainital & Pauri Garhwal
2.	Nanda Devi NP	1982	624.60	Chamoli
3.	Valley of Flower NP	1982	87.50	Chamoli
4.	Raja Ji NP	1983	820.42	Dehradun, Pauri Garhwal and Haridwar
5.	Gangotri NP	1989	2390.02	Uttarkashi
6.	Govind NP	1990	472.08	Uttarkashi
WILD LIFE SANCTURY				
1.	Govind WLS	1955	485.89	Uttarkashi
2.	Kedarnath WLS	1972	975.20	Chamoli
3.	Askot WLS	1986	599.93	Pithoragarh
4.	Sonanadi WLS	1987	301.18	Garhwal
5.	Binsar WLS	1988	47.07	Almora
6.	Musoorie WLS	1993	10.82	Dehradun

7.	Nandhaur WLS	2012	269.95	Nainital
CONSERVATION RESERVE				
1.	Jhilmil Jheel C.R.	2005	485.89	Dehradun
2.	Aasan Wetland C. R.	2005	975.20	Hardwar
3.	Pawalgarh C. R.	2012	599.93	Nainital and Champawat

Source : Website of Uttarakhand Forest Department Government of Uttarakhand, (http://forest.uk.gov.in/pages/display/80-protected-area-network)

Table IV.7- Biosphere Reserves in Uttarakhand

S.No.	Sanctuary	Year of Establishment	Area (km^2)
1.	Nanda Devi Biosphere Reserve	1988	2,236.74

Source : Website of Uttarakhand Forest Department Government of Uttarakhand, (http://forest.uk.gov.in/pages/display/80-protected-area-network)

95. Any of the sites in this subproject does not fall in any protected area declared by the Ministry of Environment and Forests, Govt. of India.

4. Fishery

96. Kali and Gori are the main rivers, flow in thc projcct arca. In the upper stretch of these rivers due to high gradient water flow is turbulent. Due to which this zone is considered as a 'no fish' zone. The fisheries in the project area are poorly developed since the potential has remained unexploited owing to difficult terrain, unfavourable climate and poor infrastructural facilities. The elevation, temperature, current, velocity and natural biota are the factors governing the growth of fish in the rivers and water bodies in the area. However, slightly bigger fish were observed in the lower region where water temperature is slightly higher. The common species found in the lower stretch are Asela or Saul, Mahaseer, 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.

I. Socio-Economic

1. Social and Cultural development

i. **Demographic Profile** As per the 2011 census, population of district Pithoragarh is 4,85,993, where contribution of male and female population were 240427 and 2,45,566 respectively. This gives it a ranking of 546th among the 640 Districts of India and 8th in Uttarakhand. 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%.

ii Culture

97. Historically, inhabitants of the project area are the descendants of the nomadic pastoral Aryans who, in their eternal quest for fresh pastures, came to India from Central Asia and settled here. Their village comprises two communities, namely, Danus and Takulis. Intrinsically, we are pastoral agriculturists and are dependent on subsistence level agriculture, growing a wide range of food crops without external inputs. They keep livestock's, which are taken to higher pastures (alpine grasslands) during the summer months for grazing. They have been closely associated with our surrounding forests and have been heavily dependent and living off them in a non-destructive, sustainable manner. The forest holds a special significance and place in our lives and are revered and prayed to They have been harvesting the surrounding forest for ages for their own use. These forests have been providing them fuel, fodder, food, timber and medicinal plants.

98. The people are hard working community, very amicable and friendly and are great lovers of music and dance, with a storehouse of folk songs and dances. Traditionally, they never indulged in alcohol or drugs. Home brewed spirits were introduced in their region by the Bhotia tribe. They are mainly vegetarian by force of circumstance, and have maintained ourselves since Pre-history in a harmonious balance with the surrounding natural environment.

Ethnic Group

Rajput

99. The Rajputs of Kumaon are said to be of Vedic Aryan origin. Initially Rajputs came to Kumaon from Himachal Pradesh, where they had come from the Hindu Kush through Kashmir. Later Rajput settlers to Kumaon also came from plain (Mewar, Chitoor etc) to escape from the invasions of the Muslim and Mughal rulers. In some cases they started naming their settlements/surnames after the name of their places of origin. The Rajputs took over the control of Kumaon region from Kols and Khasas. Later a larger number of Khasas imbibed the Vedic traditions, culture and names.

Brahmins

100. The Brahmins of Kumaon are the descendants of the Vedic Aryan priests who migrated from the plains. A large number of Vedic Brahmins came during the migration of the Rajputs and in some cases the Brahmins who came to visit the religious places in Kumaon decided to settle there for good. Like in case of Rajputs they started naming their settlements/surnames after the name of their places of origin. Later a larger number of Khasas imbibed the Vedic traditions, culture and names.

iii Tribal communities :

101. 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 is spread among the three valleys of Darma, Chaundas, and Byans.

Bhotias

102. Bhotiya are the main tribal community in inhabiting in the project area. Their name, Bhotiya, derives from the word Bod (Bodyul), which is the Classical Tibetan name for Tibet. The Bhotias have distinctive Tibetan-like physical appearance. The Bhotias in Kumaon region are mostly living around Dharchula area, Pithoragarh region. Some familires of this tribe are scattered in villages of the project area and engaged in the tourism business. The tribes of Bhotia living in Kumaon region are from the "Shauka" tribes and are referred as "Shaukas". The other two tribes of Bhotias (Jadhs and Marchas/Tolchas) mostly have been living in the Garhwal region of Himalayas. The Jadhs are mostly in Uttarkashi region and the Marchas (traders) and Tolchas (farmers) in Chamoli region.

Rajis or Banrajis

103. The Rajis/Banrajis, as the name suggest were mainly residing in the forest of around Askot in southern Pithoragarh (South Eastern part of Kumaon). Some families of the Rajis are also settled in the villages located in the project area. Traditionally the Rajis practiced shifting cultivation until it was banned by the forest department. The Raji religion has a reputation of living in isolation in relation to their surroundings.. The tribes have their own separate pantheons but they also worship a few Hindu gods. However their ceremonies are simple and do not complex rituals and are done Brahmin priests The Raji construct simple open-air altars with prayer flags and cloth swaying in nearby trees.

2. Land Use and land use pattern

104. Most of the land in district is under the pasture land. Forest land is the major land use in the hills of Uttarakhand and the forest department is the sole owner of the forest land. A clear distinction can be made between land use patterns in the hill and the plain districts in terms of net area sown, barren land, culturable waste, permanent pastures. Some of these classifications show degradation in the upland lowland ecosystems and the others indicate the important role certain land use(s) play in maintaining the ecological balance. For example, the cultivable waste land and fallow lands are generally lands left fallow temporarily to regain soil fertility. The geographical area of district Pithoragarh is 7250.0 km^2. Out of which the land under forest cover is 5401.5 km^2, land under cultivation is 532.78 km^2, Cultivable barren land is 407.59 km^2 and land under the human settlement is 110.1 km^2

J. Health

105. The health care system of district Pithoragarh is a three tier structure. It has "Sub-center" at the most peripheral level, "Primary Health Centre" at the intermediate level and "Community Health Centre" at the secondary level. The population covered by a "Sub Centre", "Primary Health Centre" and "Community Health

Centre" are "3,000-5,000", "20,000-30,000" and "100,000", respectively. In addition, there are Private Voluntary Healthy Facilities, also. As per Uttarakhand government organizational set up, the District is headed by a District Magistrate, who is also the chair person of the Integrated District Health Society of Pithoragarh district. The District health set up of Uttarakhand government is headed by the Chief Medical Officer followed by a Deputy CMO as second-in-command. Chief Medical Superintendent looks after the Uttarakhand government hospitals in the district. There are 308 government health care facilities in the district, as can be seen from the table given below:-

Table IV.8: Health facilities and infrastructure in district Pithoragarh

Public Health Centre	Community Health Centre	Family and Mother Child Centre	Family and Mother Child Welfare Sub Centre	Ayurvedic Hospital	Homeo-pathic Hospital	Allopathic Hospital
18	4	8	156	63	13	46

Source: Economic and Statistical Department of Pithoragarh-Annual Magazine, 2012 (http://pithoragarh.nic.in/pages/view/80-statistical-handbook-2012)

K Literacy

106. Literacy rate in Uttarakhand has seen upward trend and is 79.63 percent as per 2011 population census. Of that, male literacy stands at 87.40 percent while female literacy is at 67.06 percent. In 2001, literacy rate in Uttarakhand stood at 71.62 percent of which male and female were 81.02 percent and 63.36 percent literate respectively. In actual numbers, total literates in Uttarakhand stands at 6,880,953 of which males were 3,863,708 and females were 3,017,245.

107. Average literacy rate of Pithoragarh in 2011 were 82.25 compared to 75.95 of 2001. If things are looked out at gender wise, male and female literacy were 92.75 and 72.29 respectively. For 2001 census, same figures stood at 90.06 and 62.59 in Pithoragarh District. Total literate in Pithoragarh District were 345,550 of which male and female were 189,623 and 155,927 respectively.

L. Cultural and archaeological resources

108. The lineage of Pithoragarh can be traced to the age of Puranas when it flourished under different names, though no documents from that era has been recovered. What is known though, that Pithoragarh used to be an important stopover en route Kailasa Parbat. Ancient religious texts such as Rig Veda and Skanda Purana mention about the various tribes that inhabited the area. They were probably the first people to establish a human population in the area.

109. The first recorded history is from the time of the great Rajputa King Prithviraj Chauhan. It is said that when he expanded his kingdom, he named this place as 'Rai Pithora' since it was a Rajput tradition to name a place after settling there. Gradually, with time and usage, the name became 'Prithigarh' under the Chand and Katyuri dynasties. With the Mughal

invasion, the linguistics further evolved and its present name of Pithoragarh became famous.

110. The functions and festivals of district Pithoragarh are not only an expression of the religious social and the cultural urges of the people but have also sustained the folk culture and have been central to the economic activities of the people. Also at remotely located places of hilly terrain, especially where communication is difficult and the land is cut up by mountain or water, the need is felt for periodical meetings at convenient centers, where exchange and sale of commodities may take place. A district like Pithoragarh holds many valleys which are absolutely dependent on such meetings for their supply of common necessaries, and consequently fairs or periodical markets are numerous.

Livelihood

111. Majority of population (59.94%) is engaged in the agricultural activities and 0.50% of the population is engaged as agriculture labourers. About 36.0% of total population in the project area involves in the tourism sector and work as porter and 3.56% of the population is engaged in their family business (trading).

M. Economic development

1. Transportation and communication

112. 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. Uttarakhand State Road Transport Corporation and Kumoan Motor Owner Union (KMOU) Ltd provide transportation facility to most of the important routes. Some private taxi and cabs operators are giving their service to all the small villages.

113. Uttarakhand has a total road length of 41,041 km. The road density in the State stands at 767.4 km per 1,000 sq km and 432 km per lakh population. The State has National highway (NH) of 2,042 km and State highways of 1,576 km (as on 31st March 2010). Density of road length per 100 sq. Km. is 45 km which is very low compared to the national average of 97 km.

114. Pithoragarh district is connected to other major stations of Kumoan region through state highways and district highways. The overall road network in the district Pithoragarh is 1514 km, out of which 223.0 km comes under National Highway and maintained by Border Road Organization, 243.0 km comes under state highways, 890.0 km comes under district road state highway and 215.46 km is under village road.

Table IV.9:- Category wise description of road in district Pithoragarh.

S.No.	Category of Road	Length of Road
A.	**National Highways under BRO**	223.0
B.	**Roads under PWD**	

	I.	State Highways	243.0
	II.	District Road	890.0
	III.	Village Road	143.0
C.	**Nagar Panchayat/ Jila Panchayat**		15.0
	Total Length		**1514.0**

Source: Economic and Statistical Department of Pithoragarh-Annual Magazine, 2012 (http://pithoragarh.nic.in/pages/view/80-statistical-handbook-2012)

2. Industrial Development

73. As of now Uttaranchal has 300 hundred registered large and medium scale industrial units in operation. Total number of workers employed by these units was 41,777 in 2005. These industrial units, not large in number, and are concentrated mostly in the in the plains. Three districts in the plains viz., Dehradun, Haridwar, and Udham Singh Nagar together account for 82% of the workers employed in 40% of the total number registered units in the State. On the other hand the hill districts in Uttaranchal (other than Nainital), are lagging far behind the districts in the plain. Due to long distances, hilly terrain, scattered population and limited markets, industrialization, especially in hilly areas of the State, has been extremely limited. Excluding Nainital, the four hill districts (Pauri Garhwal, Tehri Garhwal, Almora and Bageswar) together account for 32% of the total registered units in the State and 9.3% of total industrial workers. In Pithoragarh Wool spinning and weaving are old cottage industries which are said to have existed in the region covered by the Pithoragarh district for centuries. Woolen goods like *thulmas*, *chuktas* (types of blankets), *namdas* (carpets) and tweed are produced in about 25,000 units, engaging about 75,000 persons, at Bering, Dharchula, Didihat, Munsyari, Pithoragarh, Sirkha and Thal. It has been estimated that a sum of about Rs 12,25,00,000 was invested in the industry, and wool and woolen goods worth Rs 12,98,154 were manufactured. Indo-Tibetan wool trade had helped in the growth of this industry. The inhabitants of the northern *pattis* were manly engaged in this craft. Most of them spun and wove the wool of their indigenous sheep. The staple was short and the texture of the wool coarse, and rough blankets were woven. Only a few of these were sold, most of them being used by the weaver and his family. However, the Tibetan sheep provided them with fine wool of long staple, which they wove into rough serge (for making garments) or made it into wraps. Another old time handicraft of the district, baskets and matting manufactured out of *ringal* found its way to Tibet and a large number of baskets and matting were sold in the fairs at Jarajibli and Thal.

74. Besides wool weaving, leather goods, furniture, metal goods, baskets and mats, production of oil (from oil-seeds), job-work (printing) and radio repairing are the other cottage and village industries. These units are widespread and are generally situated near the dwellings of the workers and are manned by the members of the owner's family.

75. Tourism and cottage industries is also a good contributor in the economy of the project area. During Kailsh Mansarovar, Adi Kailsh yatra and trekking season most of the village population located on the rout engaged in the tourism sector in the form of porter and tourist

guide. Male population gives their service as tourist porter with their ponies for the pilgrims going on the rout.

76. Very recently, a new earning opportunity has been found in the form of a fungus, colloquially known as caterpillar fungus. The fungus is known in Tibetan as yar tsa gambu. Caterpillar fungi are the result of a parasitic relationship between the fungus and the larva of the ghost moth genus Thitarodes, several species of which live on the Himalayas in India and Nepal. The fungus germinates in living organisms, kills and mummifies the insect, and then the fungus grows from the body of the insect.

Animal Husbandry

77. Animal Husbandry is an important economic activity in Pithoragarh which alongwith agriculture provides sustenance to the farmers. Domestic animals help in agricultural activities and also provide milk, butter, meat, wool, dung manure etc. Animal husbandry is an important source of supplementing income of the rural population. Sheep rearing is an important industry in the district. In the high hills, the villagers also rear sheep and goats. Livestock is considered to be one of the important sources for the economic and industrial development of an area. Sheep are largely concentrated in Kapkot due to high altitude and cold weather.

78. Sheep rearing for production of wool and meat, tourism (cottage industries) orchards, spinning and weaving of wool, copper, fruit chalk and etc. are other small scale industries in Pithoragarh District are sericulture and Pisiculture.

3. Agriculture, Horticulture and Forestry

79. Agriculture is the predominant economic activity in the district Pithoragarh and it has the main share in the District economy. The employment opportunities in other economic activities are seasonal and very less and as such there is a high dependency on agriculture.

80. Pithoragarh is characterized by periodic soil erosion and frequent landslides. Traditional agricultural practices have been unable to support the needs of growing population, with the result out-migration from the district is reported. Agriculture in the area suffers from many constraints. The limited availability of cultivatable land is a major constraint for the development of agriculture. As much as 88% of the area is either covered by forests or is barren or uncultivable. The fertility of land except in the valleys is low. The land holding size in the district is small. Short agricultural season, low temperatures, high altitude, perpetual problem of soil erosion due to steep gradients etc. are other inhibiting factors affecting agriculture. Agriculture, therefore, does not offer too much hope for improving the economic condition of the people in the area. Terrace cultivation is common in these areas because of hilly terrain and steep slopes. Some cultivation is done on steep hills also where terracing and tilling cannot be done even by burning scrubs and bushes to clear the land for cultivation. Both Rabi and Kharif

crops are sown in most of the areas. The main Kharif crops are paddy, small millets and potato and chief Rabi crops are wheat and barley. These crops account for over 80 percent of the total cropped area. Major crops include (i) cereals (rice, wheat, barley, maize, manduwa, and sanwan); (ii) pulses (urad, masoor, peas, gram, and soybean); (iii) oil seeds (rape and mustard, sesame and soyabean); and (iv) other crops (potato).

Table IV.10:- Total Agricultural production in district Pithoragarh

Name of the Crop	2009-10			2010-11		
	Production (Quintal)	Rate (In Qui.)	Value of Production (Thousand Rs)	Production (In Quin.)	Rate (In Quin.)	Value of Production (Thousand Rs.)
CEREAL						
Rice	275270	2200	605594.00	284540	2300	654442.00
Wheat	338110	1400	473354.00	337340	1600	539744.00
Barley	52710	1200	63252.00	45380	1400	63532.00
Maize	27670	1500	41505.00	34940	1600	55904.00
Mandua	132610	1600	212176.00	115380	1700	196146.00
Sanwan	16870	1000	16870.00	14970	1000	14970.00
Total Cereal	**843240**		**1412751.00**	**832550**		**1524738.00**
PULSES						
Urad	5740	5800	33292.00	5250	6000	31500.00
Tur	17840	5500	98120.00	34620	5800	200796.00
Gram	10	5500	55.00	210	5600	1176.00
Lentil	490	4400	2156.00	40	400	16.00
Pease	240	5200	1248.00	350	5400	1890.00
Total Pulses	**24320**		**134871.00**	**40470**		**235378.00**
OILSHEEDS						
Mustard	1740	9500	16530.00	1600	9600	153600.00
Sesame	120	12000	1440.00	130	12500	1625.00
Soyabean	13380	4700	62886.00	10590	4900	51891.00
Total Oilseeds	**15240**		**80856.00**	**12320**		**68876.00**
Other crops						
Potato	56800	1800	102240.00	9685	1600	15496.00
GRAND TOTAL	**939600**		**1730718.00**	**895025**		**1844488.00**

Source: Economic and Statistical Department of Pithoragarh-Annual Magazine, 2012 (http://pithoragarh.nic.in/pages/view/80-statistical-handbook-2012)

Horticulture

81. Pithoragarh district due to its geographical setting and traditional linkages with horticulture has vast potential for its expansion in the near future. Demographic and occupational pattern in the district clearly highlight the dependency of majority

of the population that resides in villages on agricultural and horticultural activities. The District is rich in the production of pear, citrus and mango, but the value addition of this activity in the District is poor and farmers don't get good price for their produce. Due to this, farmers have to sell their produce as soon as they are harvested on minimal price.

Fishery

82. The large water resources in the district offer the possibility of developing fisheries on commercial scale but this is a very insignificant part of the economic activities in the district, although the Fisheries department has distributed fish seeds in large proportion. 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, Mahaseer, 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.

O Energy and electric power potential

83. Pithoragarh is known for its beauty. The Kali and Gori are the main rivers flowing through this district. In the district Pithoragarh, Uttarakhand Renewable Energy Development Agency (UREDA) and Private Hydro Power Companies have been engaged in the electric generation and Uttarakhand Power Corporation is engaged in the remote village electrification as well as for grid feeding.

Table IV.11:- Details of Electric generation and distribution in district Pithoragarh

S.No.		Unit	Details
A.	**Total electric generation capacity**	MW	5
B.	**Electric Generation**	MU	3.17 MU
C.	**Length of Electric Line**		
I.	33 KW	KM	110.57
II.	11 KW	KM	1134.02
III.	LT	KM	1868.03
D.	**Electric Consumption**		
I.	Domestic	Thousand KW	18139
II.	Commercial	Thousand KW	5737
III.	Industrial	Thousand KW	4222
IV.	Public Lights	Thousand KW	165
V.	Agriculture	Thousand KW	898
VI.	Public water and savage treatment plant	Thousand KW	1770
E.	**Village electrification**		
1.	Electrified Village	No.	848
I.	Uttarakhand Power Corporation	No.	796
II.	UREDA	No.	15
III.	Small Hydro Projects	No.	37
2.	Electrified Hand pump and pump set	No.	13

3.	Small light connections	No.	7942

Source: Economic and Statistical Department of Pithoragarh-Annual Magazine, 2012 (http://pithoragarh.nic.in/pages/view/80-statistical-handbook-2012)

P. Aesthetic and tourism

84. Pithoragarh is rich in natural beauty and it offers best view of the Himalaya. Some of the peaks like Nanda Devi, Panchchuli, Trishul and Nandakhat falls in this district. It is also rich in flora and fauna and is famous for its bugyals or pasture grounds of velvet-like green grass. With the start of the Kailash-Mansarovar Yatra, tourist interest in the area is increasing by leaps and bounds. Kapileshwar Mahadev the cave temple dedicated to Lord Shiva, affords fine view of the Soar valley and lofty Himalayan peaks. Askot Sanctuary, 54 kms. from Pithoragarh, is popular among wildlife enthusiasts and nature lovers. It is a safe haven for snow leopards, Himalayan black bears, musk deers, snow cocks, tehra, monals, chirs, koklas and chukors. The Patal Bhubaneshwar literally means the sub-terranean shrine of Lord Shiva and this cave temple is 91 kms. from Pithoragarh. The way to the temple is through a tunnel which leads into the cavern through a narrow dark passage of water. In fact cave temple complex is said to be the abode of thousands of deities and people believe that these deities were consecrated by Adi Shankracharya. Munsyari is a small Himalayan township about 127 kms. north of Pithoragarh and 66 kms. from Jauljibi. It is a base for treks to Milam, Namik and Ralam glaciers. Pithoragarh is also one of the border districts of India, surrounded by Tibet and Nepal

85. The main festival of Pithoragarh are is the Uttraini festival which, is organized in the month of January for a period of one week and is frequented by traders, on barter or money lending intent, and by the Bhotiyas from the snows, as well as by a great multitude of people from the surrounding villages. The chief articles of merchandise are: ponies, goats, sheep, furs, yak tails, musk pods, borax, salt horns, books, shoes, fruit dried and fresh. The Bhotiyas bring down excellent ponies, which breed in a wild or semi-wild state over the Tibetan border. They also have a number of local fairs, like Kandali and Theejam, dedicated to the Bhumiyal deity (*deity of soil*) and celebrated once in 12 years. In this festival native people gathered in native village and celebrate. Thus, all their fairs and festivals have some links to bio-resources and they have various practices, which have inherent conservation values. Their other main festivals are Diwali, Dusshera, Kalyon, Phooldeyi, Ghughutia, Kojagar, Sankat Chaturthi, Sankrati, Harishayani Ekadashi and Harela, which they celebrate with a lot of fervour and gaiety.

86. The district is very rich in various types of folk-songs and folk dances. Significant folk-songs are the Neoli, Chira, Chaiti, Hurkiyabol, Baira, Bhagnola, Jagar and Ghaneli. The Neoli is very popular in the eastern part of the district and is a duet between lovers but the theme of the song is mainly ethical and philosophical. The

Jagar and the Ghaneli songs contain long illustrative pieces from the *Mahabharata* or the Puranas, or narrate the deeds of local heroes now deified. These songs have a ritualistic importance and are usually sung in the long winter nights. They are also sung when somebody in the household is supposed to be under the influence of some evil spirit. The Jagars contain episodes of village gods and godlings, like Gananath, Bholanath, Bhagwati, Narsing and Churmalla, and in the Ghaneli the gods from the sacred pantheon are praised. Ramolas and Malushahis are mainly folk ballads; the former describe the episodes of the famous Ramola brothers and the latter narrate the heroine Rajula's wanderings.

87. Prominent folk-dances of the district are Jhora, Chanchari, Chapeli, Bhado, Devtali, Jhumaila, Chaufula, Dhol and the Hurka. The Cholia is a pure folk-dance, with no singing at all. The dancers present the warring scenes of Rajput heroes, with swords and shields in their hands. The Jhora, Chanchari, Chapeli and Devtali are more popular folk-dances and are accompanied by songs. The Jhora is the most popular dance and may be performed by any number of people during the day or the night. It is associated with the coming of the spring season. The participants—men, women or both, hold each other by the arms and sang together bending forward and backward slowly in their movements.

Table IV.12:- Number of Tourist and tourist facilities available in district Pithoragarh

S.No.			Duration	Unit	Details
A	**Tourist Facility**				
	I.	Main Tourist Destination	2010-11	No.	24
	II.	Tourist Rest House	2010	No.	9
	III.	Available beds in TRH	2010	No.	392
	IV.	Rain Baser	2010	No.	01
	V.	Available beds in TRH	2010-11	No.	30
	VI.	Hotels and Paying guest	2010-11	No.	92
B	**Data of Tourists**				
	Tourist (including pilgrims)				193732
	I.	Indian Tourist	2011	No.	193059
	II.	Foreign Tourist	2011	No.	673

Source: Economic and Statistical Department of Pithoragarh-Annual Magazine, 2012 (http://pithoragarh.nic.in/pages/view/80-statistical-handbook-2012)

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

88. The assessment for environmental impacts due to the implementation of this project has been carried out for potential impacts during the following stages of the project planning and implementation:
   - **Location impacts.** Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities.
   - **Design impacts.** Impacts arising from project design, including the technology used, scale of operations, discharge standards, etc
   - **Construction impacts.** Impacts resulting from construction activities including site clearance, earthworks, civil works, etc
   - **O&M impacts.** Impacts associated with the operation and maintenance of the infrastructure built in the project.

89. 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 (Annexure I). 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

90. The proposed subproject locations are either within existing premises of KMVN or in the lands available with the government. During the survey no impacts envisaged on land acquisition or resettlement due to the proposed subproject components.

1. Land Ownership

91. The sub-project area lies within district Pithoragarh A total of 16 locations are proposed for Construction of FRP Huts in district Pithoragarh under this package. The locations as per the land availability with ownership status was finalized after site visits of 9 sites. Land belonging to Tourism department and Govt of Uttarakhand is selected for the subproject. There is no case of private land acquisition. In most of the cases the locations are proposed within the Kumoan Mandal Vikas Nigam campus.

92. There is no resettlement issue envisaged in case of all 9 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.

93. The location selected for construction of the FRP Huts with 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.

2. Impact on existing or proposed land use

Most of the proposed FRP constructions are proposed inside the premise of the existing Tourist Rest Houses belonging to KMVN and government land. The connecting Roads to sites for proposed FRP Huts are not a 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

1. Location Impacts

94. 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

95. 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. 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 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.

3. Construction Impacts

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 and supervised by the DSC. 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 (v) dust generation, air and noise from construction activities, (vi) handling of construction materials at site, (vii) adoption of safety measures during construction; and (viii) community health and safety. Subproject involves construction of FRP which are made up of pre-engineered prefabricated steel and reinforced plastic panels erected on concrete base, as such very little construction material would be involved. Transportation of construction and prefab material is expected to have negligible adverse impact on the access roads. However any damage to the roads due to transportation of construction material would be corrected by the construction contractor as per GCC of Contract at no additional cost.

4. Operation and Maintenance Impacts

96. Impacts during operation of FRP created in the Sub project will be due to lack of appropriate maintenance of the facilities created including the sites around the tourist rest houses, toilets, parking facilities, access roads to FRP hut sites apart from drainage and solid waste management of the tourist destinations. These impacts are proposed to be addressed through provisions of water and waste management and orientation of the Tourist facility owners in management and operation of such facilities including collection of wastes, operation of toilet facilities, timely cleanup of waste disposed by the tourists and aesthetics through appropriate maintenance of access roads and landscaping. Govt of Uttarakhand / KMVN shall make special provision for operation and maintenance of FRP/Hybrid Huts and all allied facilities.

C. Benefits

Construction of FRP

97. FRP will restore the tourism in affected areas and will act as ecofriendly solution to the accommodation needs and the extra tourist pressure during peak tourism season. It will also enhance the attractiveness of these destinations. While the enhanced tourist generation due to these improvements may not be significant, the facilities will enhance the site experience of the tourist/pilgrim and will also enhance tourist safety as the structures are designed for earthquake resistance. The project will facilitate environmental improvements through the provision of training to operators for all sanitation and solid waste facilities provided by the Project, in order to sustain any improvements made.

D. Cumulative Impact Assessment

98. 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.

99. 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.

100. Implementation of the project will not have any bearing on ecology and environment of the locality. Since the structure 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 design and constructions are consistent with the surrounding landscape. 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

A. Public participation during the preparation of the IEE

101. 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 (issues, comments and concerns) with regard to the proposed development; giving the stakeholders feedback on process findings and recommendations; and ensuring compliance to process requirements with regards to the environmental and related legislation.

102. 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.

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

PUBLIC CONSULTATION RECORD

Place: Gala Yatra Camp
Tehsil- District: Pithoragarh
Date: 23/08/2014
Participants: KMVN officials village person

1. **Issues Discussed:**
   - Impact on the local environment, due to construction of structures.
   - Expectation of people for employment generation during construction activity.
   - Any nuisance or health hazard due to construction activity.
   - Any impact on traditional and old trade rout.
   - Lack of facilities.
   - Need of the structures.
2. **Stakeholder's Response:**
   - There will be no major impact on environment, flora and fauna due to

construction activity but due care should be taken to preserve flora.

- Villagers will be looking forward for better livelihood and overall development.
- There will be no extra burden on the existing resources (market/water supply/ fuel/fodder) available in the area during the construction and operation phase of the project.
- Local labour should shall be hired during construction and operation.
- Effort should be taken to avoid any major health hazard during construction.

3. **Recommendations & Suggestions:**
   - Efforts should be taken for the generation of employment for local people in construction work
   - Measures should be taken to avoid extra pressure on the existing resources in the area.
   - During emergency period local people shall be given shelter, if required in the proposed structure.

Place: Malpa
District: **Pithoragarh ;** Tehsil:**- Dharchula**
Date: 24/08/2014
Participants: KMVN officials and Local shopkeepers

1. **Issues Discussed:**
   - About project and its source of assistance, its implementation/execution etc.
   - Discussion among public for sharing of information related to project (environmental safeguard policy, direct and indirect impacts of improvement/restoration work on environment).
   - Occurrence of disaster like cloud burst, land slide in past.
   - Construction activity whether causing any type of health hazard or not?
   - Any loss of land/structure/business or other community property due to construction activity?
   - Any damage to historical or cultural monuments along project road?
   - Possible type of problems faced by the local people in their daily activities due to restoration work?
2. **Stakeholder's Response:**
   - There will be no impact on the traditional trek, as the trek rout is used for trade with China.
   - Local community thinks for better livelihood and overall development.
   - Local communities also want their deployment during construction to get employed.
   - As per consultation, no cultural or historical place is along the project site.
   - Most of the consulted person suggested that during construction measures shall be taken to avoid inconvenience to shopkeeper as well as local population.
   - All of them were agree to extend their full co-operation as and when required.
   - It was also a common view that restoration work should be of good quality and durable.

3. **Recommendations Suggestions:**
   - Effort should be taken for the generation of employment for local people during construction.
   - Efforts should be taken for the generation of employment for local people in construction work
   - In order to avoid extra pressure on natural resources proper measure will be adopted during construing/ operation of FRP huts.

Place :Budhi
District: **Pithoragarh;** Tehsil:- **Dharchula**
Date: 25.08.2014
Participants: KMVN officials and Villagers

1. **Issues Discussed:**
   - Sanctity and identity of the local area should not be harmed.
   - During construction and operation phase of the project, pressure should not be on the local resources.
   - Local labour Shall be engaged during the construction and operation
   - Impact on the local facilities available in the area.
2. **Stakeholder's Response:**
   - Villagers think that the area will get exposure due the tourism development.
   - Project should not have any pressure on the local area.
   - Employment for local village people for construction.
   - Construction activity is not causing any major health hazard.
3. **Recommendations & Suggestions:**
   - Local labor should be engaged during construction.

Place: Kalapani and Nabhidhang

(Public Consultation was done at Kalapani yatra camp for Nabhidhang and Kalapani, as there is no human settlement ahead of Kalapani)
District: **Pithoragarh** ; Tehsil- **Dharchula**
Date: 26.08.2014
Participants: KMVN officials

No human settlements in terms of village are available in the area. The area is in control of armed forces. Although some tents of porters and businessman are also available in the area during yatra (June-September) or trade period (April-November).

Participants: KMVN officials and stakeholders

1. **Issues Discussed:**
   - Impact on the local environment, due to construction of structures.
   - Expectation of people for employment generation during construction activity.

- Any nuisance or health hazard due to construction activity.
- Any impact on any historical, cultural or religious monument.
- Lack of infrastructure facilities.
- Need of the structures

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.
   - There should be no extra pressure on the natural water resources
   - Effort should be taken to avoid any major health hazard during construction.
   - Existing structure are not enough to accommodate tourist during peak season time.
3. **Recommendations/Suggestions:**
   - Natural resources should be intact

Place: Gunji

District: **Pithoragarh**, Tehsil- **Dharchula**
Date: 27.08.2014
Participants: KMVN officials and Local resident

1. **Issues Discussed:**
   - Local area will be developed due the tourism development.
   - People's expectation for employment generation during construction.
   - Local products may be encouraged.
   - Any loss of land/ property due to construction activity.
2. **Stakeholder's Response:**
   - There should not be any major impact on the area due to the constriction.
   - Villagers must get an employment during the construction/ operation.
   - Local culture and product may be used during the operation.
   - Construction should not have any health impact on the local area.
   - Only Revenue/ Govt. Land may be used for the proposed work.
3. **Recommendations & Suggestions:**
   - Local labor should be engaged during construction.
   - Local trek rout should be maintained.

Place: Kutti
District: Pithoragarh, Tehsil- Dharchula
Date: 27.08.2014
Participants: KMVN officials and Villagers

1. **Issues Discussed:**
   - Impact on the local environment, due to construction of structures.

- Expectation of people for employment generation during construction activity.
- Any nuisance or health hazard due to construction activity.
- Any impact on any historical, cultural or religious monument.
- Lack of facilities.
- Need of the structures

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.
   - During construction the road network should be developed/maintained the contractor.
   - Villagers want employment for local village people during construction.
   - Effort should be taken to avoid any major health hazard during construction.
   - Existing infrastructure are not adequate to accommodate more tourist.
   - Existing water resources should not be disturbed during construction and operation.
3. **Recommendations & Suggestions:**
   - Employment to local worker should be provided during construction and operation of the project.
   - Provision should be made for proper dumping of waste generated during operation of these FRPs.

Place: Sirkha Yatra camp near Pangu Village
(Public Consultation for Sirkha and Paangu was done at Sirkha Yata Camp as the both the village in under one Gram Panchayat
District: Pithoragarh; Tehsil- Dharchula
Date: 29.08.2014
Participants: KMVN officials and Villagers

1. **Issues Discussed:**
   - About project and its source of assistance, its implementation/execution etc.
   - Discussion among public for sharing of information related to project (environmental safeguard policy, direct and indirect impacts of improvement/restoration work on environment).
   - Occurrence of disaster in past and its last construction/restoration.
   - Construction activity whether causing any type of health hazard or not?
   - Any loss of land/structure/business or other community property due to construction activity?
   - Any damage to historical or cultural monuments along project road?
   - Possible type of problems faced by the local people in their daily activities due to restoration work?

- Available road structure should be repaired if damaged during the construction phase.

2. **Stakeholder's Response:**
   - Local community stated that, no wild life movement has been observed in near past.
   - Local people prefer FRP development and restoration of torist structure in the area, as they are in view that there will be negligible impact on the environment due to construction of the proposed structure.
   - Local communities want minimum inconvenience and their deployment during construction of the proposed structure.
   - As per consultation, no cultural or historical place is along the road alignment
   - All of them were agree to extend their full co-operation as and when required.
   - It was also a common view that restoration work should be of good quality and durable.
3. **Recommendations & Suggestions:**
   - Employment to local worker should be provided during construction and operation of the project.
   - Resources available in the area should be used sustainably.

B. Future Consultation and Information Disclosure

104. The public consultation and disclosure program will remain a continuous process throughout the subproject implementation.

C. Consultation during Detailed Design

105. 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.

106. 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.

107. The PIU/PMU, with assistance of DSC will conduct information dissemination sessions in the subproject area. During EMP implementation PIU, DSC, 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

108. 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.

109. 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

110. 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.

111. 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, (iii) DSC 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. Copies of the IEE will be kept in the PMU/PIU office and will be distributed to any person willing to consult the IEE.

VII. ENVIRONMENTAL MANAGEMENT PLAN AND GRIEVANCE REDRESS MECHANISM

A. Environmental Management and Monitoring Plan (EMMP)

112. The EMMP designed will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between the Design & Supervision Consultants (DSC) – 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.

113. 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.

114. 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.

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

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

B. Institutional Arrangements

115. 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)–Kumoan 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.

- The sub-project will be implemented and monitored by the F-PIU, KMVN under Uttarakhand Emergency Assistance Project (UEAP), which will be supported by DSC (also working as Engineer) and overall management support shall be provided by PMU, UEAP, SDMA.
- The Safeguard Staff of UEAP, SDMA (EA) in PMU, and IA will monitor the implementation of environmental covenants with assistance of Engineer (DSC).
- 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 DSC; and it would guide the IA and the civil works contractors in this regard., DSC 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.

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 (DSC) and/or Safeguards Staff of UEAP, SDMA for the duration of the Contract;
- May, on the recommendation of the Environmental Expert (EE), DSC and/or Safeguards Staff of UEAP, SDMA, through the DSC 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

UEAP, IA & F-PIU

- Ensures along with Engineer (DSC) 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 (DSC) 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, DSC and/or Safeguards Staff of UEAP, SDMA, through the DSC 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.

The Engineer (DSC)

- 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.

Environmental Expert of Engineer (DSC)

- 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 Ccontractor /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.

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

116. 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.
117. 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

118. 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:
    - 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.
    - Compliance with all mitigation measures and monitoring requirements set out

in the EMMP.

- Submission of a method statement detailing how the subproject EMMP will be complied with. This shall include methods and schedules of monitoring.
- Monitoring of project environmental performance including performance indicators defined therein, and periodic submission of monitoring reports.
- 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.
- 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 DSC.
- 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.

119. 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.

a. Quarry and Borrowing

120. 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.

121. 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.

122. 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.

b. Debris Disposal

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

c. Precautions for Protection of Environmental Measures

124. 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.
125. 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.

d. Air, Water & Noise Pollution, and Soil Contamination

126. 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.
127. The Contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer.
128. The Contractor shall reduce the dust emission due to construction activities by regular water sprinkling in the affected areas.
129. 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.
130. All the construction equipment and vehicles should remain all time in good conditions up to satisfaction of site engineers.
131. 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.

e. *Occupational & Community Health and Safety during Construction*

132. 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.

133. 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.

f. Post-Construction Clearance

134. 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.

135. 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

136. 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.

137. 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.

138. The monitoring will be carried out by the contractor through approved agency accredited by National Accreditation Board for Testing and Calibration Laboratories and will be supervised by the Environmental Expert of the Design & Supervision Consultant. The monitoring plan is outlined in Table 1 below. As part of good engineering practices in the project, there have been several measures as erosion prevention, rehabilitation of borrow areas, 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.

Table VII-1: Environmental 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, DSC, 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	Random checks	Contractor
Construction Stage			
Legislation, permits and Agreements	Permissions,/ NoCs/Consents other statutory requirement	Continuous	Contractor, DSC, 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 quality	RPM, SPM, SO_2, NO_x, CO	Once in a Quarter where work is in progress and near sensitive receptors / construction camp sites (except monsoon) for the entire construction period	Contractor, to be monitored through approved Monitoring Agency
Ambient noise	Equivalent Day & Night Time Noise Levels	Once in a quarter where work is in progress and near sensitive receptors/ construction camp during	Contractor, to be monitored through approved Monitoring

Indicators	Parameters to be Monitored	Frequency	Responsibility
		construction stage	Agency
Water Quality	TDS, TSS, pH, Hardness, BOD, Faecal Coli form	Once in a quarter where work is in progress and near sensitive receptors/ construction camp during construction stage	Contractor, to be monitored through approved Monitoring Agency
Soil	Available Nitrogen, Phosphorus, Carbon, heavy metals (including Lead) and Pesticides	Once in a quarter where work is in progress and near sensitive receptors/ construction camp during construction stage	Contractor, to be monitored through approved Monitoring Agency
Heritage Protection, if needed	Visual Inspection of works, compliance with ASI regulations and norms	Continuous	DSC/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		

Indicators	Parameters to be Monitored	Frequency	Responsibility
	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

139. 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 Kumoan Mandal Vikas Nigam as Implementing Agency and DSC 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.

140. 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).

141. 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 VII-2 below.

142. 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 VII-2: Environmental Management & Monitoring Costs

Sl. No.	Particulars	Unit	Quantity	Rate (INR)	Cost (INR) *
1	Public consultations and information disclosure	Lump Sum	01	50000	50,000.00
2	**Environmental base line Data Generation**				
2.1	Ambient Air Quality monitoring	Per Sample	16	15000	2,40,000.00
2.2	Noise Quality monitoring	Per Sample	16	5,000	80,000.00
2.3	Water Quality monitoring	Per Sample	16	9,200	1,47,200.00
2.4	Soil	Per Sample	16	8000	1,28,000.00
2.5	Dust Suppression at subproject sites	Per sample	16	30000	4,80,000.00
3	**Environmental Monitoring**				
	Construction Monitoring				
3.1	Air quality	Per sample	48	15,000	7,20,000.00
3.2	Water quality	Per sample	48	9200	4,41,600.00
3.3	Noise Levels	Per location	48	5000	2,40,000.00
3.4	Soil		48	8000	3,84,000.00
4	**Defect Liability/ Operation period**				
4.1	Ambient Air Quality	Per Sample	16	15000	2,40,000.00
4.2	Water quality	Per Sample	16	9200	1,47,200.00
4.3	Ambient Noise Quality	Per Sample	16	5000	80,000.00
4.4	Soil	Per Sample	16	8000	1,28,000.00
				Total	**35,06,000.00**
				Say	**35,06,000.00**

F. Environmental Monitoring and Reporting

143. 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 DSC/Engineer on day to day basis. DSC / 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.

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

145. 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	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 of DSC (EE)	PMU	
		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	Ensure that all site personnel have a basic level of environmental awareness training	ESO-Contractor and EE EE to deliver	IA & PMU	IA, Contractor
		Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitized to any potential hazards associated with	Environment and Safety Officer of Contractor, and EE	F-PIU, IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		their task			
		No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor	Contractor and EE	F-PIU, IA & PMU	
		All employees must undergo safety training and wear the necessary protective clothing /equipment	Contractor and EE	IA & PMU	
		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);	Contractor and EE	IA & PMU	

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

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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 be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction.	Engineer and EE	IA & PMU	
		Special attention shall be given to the screening of highly reflective materials on site.	EE	IA & PMU	
1.4	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created	Design will include provisions for ensuring effective maintenance and protection of the assets created so as to	Contractor, Engineer, EE, and F-PIU	IA & PMU	IA

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
	and the architectural/archaeological character of the surroundings	ensure the long term sustainability.			
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	IA
2.2	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, and addition of paved surfaces	Design of proposed components will enable efficient drainage of the sites and maintain natural drainage patterns.	Engineer, EE, and F-PIU	IA & PMU	IA
2.3	Selection of materials and construction technologies, if not carefully chosen, will adversely impact the aesthetic appeal of the destinations	Selection of materials will be from approved sources and construction technologies proposed will strictly conform to the Uttarakhand architecture. Any new landscaping elements will only utilize native species. Material selection would be done keeping in view that no asbestos (except as allowed), and CFC is used.	Engineer, EE, and F-PIU	IA & PMU	IA
2.4	Socio cultural resources- Ground disturbance can uncover and	Consult Archaeological Survey of India (ASI) and/or concerned Dept. of	Engineer, EE, and F-PIU	Contractor, IA & PMU	IA

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
	damage archaeological and historical remains	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.			
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	IA
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	Contractor	Engineer, EE, and F-PIU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		necessary temporary works shall be removed with prior approval from the Environmental Expert of DSC. All areas used for temporary construction operations will be subject to complete restoration to their former condition with appropriate rehabilitation procedures as per the rehabilitation plan prepared by the contractor and approved by the EE of DSC.			
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 DSC. Construction camps shall not be proposed within 500 m from the sensitive receptors, nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. Location for stockyards for construction materials shall be identified at least 300 m away from watercourses. Construction camps will be located	Contractor with the Engineer and EE	F-PIU, IA & PMU	Contractor

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

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		prepared by the Contractor in consultation and with approval of Environmental Specialist of DSC. The Environmental Specialist of DSC 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.			
3.4	Stockpiling of construction materials	Stockpiling of construction materials does not impact obstruct the drainage and Stockpiles will be covered to protect from dust and erosion.	Contractor with the Engineer	F-PIU, IA & PMU	Contractor
3.5	Quarry operations	Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. The Contractor shall obtain materials from approved quarries only after	Contractor with the Engineer	F-PIU, IA & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		consent of the Department of Mines and Geology and District Administration. Adequate safety precautions will be ensured during transportation of quarry material from quarries to the construction site. Vehicles transporting the material will be covered to prevent spillage.			
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 DSC & 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	Contractor with the Engineer	F-PIU, IA & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		Ground Water Department for the extraction and seek their approval for doing so and submit copies of the permission to DSC.			
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	Contractor
3.8	Water Pollution from Construction Wastes	The Contractor shall take all precautionary measures to prevent entering of wastewater into streams, water bodies or the irrigation system during construction Contractor shall not wash his vehicles in river/stream water and shall not enter riverbed nearby the water resource area for that purpose.	Contractor with the Engineer	Engineer, F-PIU & PMU	Contractor
3.9	Water Pollution from Fuel and Lubricants	The Contractor shall ensure that all construction vehicle parking locations, fuel/ lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites shall be located at least 300 m away from rivers/streams and irrigation canal/ponds if any Contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and refueling	Contractor	EE of DSC, Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
3.10	Soil Pollution due to fuel and lubricants, construction waste	The fuel storage and vehicle cleaning area will be stationed such that spillage of fuels and lubricants does not contaminate the ground. All pollution parameters will be monitored as per monitoring plan. Wastewater from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be collected and separated through an oil interceptor before discharging it on land or into other treatment system.	Contractor	Engineer, F-PIU & PMU	Contractor
3.11	Generation of dust	The Contractor will take every precaution to reduce the levels of dust	Contractor	Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		at construction 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	Contractor
3.13	Noise Pollution	The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the	Contractor with the Engineer	EE, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		MoEFCC/CPCB noise standards and all Vehicles and equipment used in construction shall be fitted with exhaust silencers. At the construction sites noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am. Noise limits for construction equipment used in this project will be in conformity to the BIS/SPCB/CPCB standards Regular monitoring of ambient noise levels to ensure compliance to Uttarakhand Environment Protection &Pollution Control Board standards.			
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	Contractor	Engineer, F-PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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.			
3.15	Disposal of Construction Waste / Debris / Cut Material	The Contractor shall confirm that Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed around the project site indiscriminately.	Contractor	Engineer, F-PIU & PMU	Contractor
3.16	Safety Measures During Construction	Personal Protective Equipment for workers on the project and adequate safety measures for workers during handling of materials at site will be taken up. The Contractor has to comply with all regulations regarding safe scaffolding, ladders, working	Contractor	Engineer, F-PIU & PMU	Contractor

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

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		minimum. Provide traffic management personnel, barricade, appropriate signage and safety information in and around the construction site and prevent local people entering into the construction site.			
3.17	Clearing of Construction of Camps and Restoration	Contractor to prepare site restoration plans for approval by the Engineer. The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer and facility owner.	Contractor	Engineer, F-PIU & PMU	Contractor
3.19	Risk of archaeological chance finds	Strictly follow the protocol for chance finds in any excavation work; Request FPIU/DSC or any authorized person with archaeological field training to observe excavation; Stop work immediately to allow further investigation if any finds are suspected;	Contractor	Engineer, F-PIU & PMU	IA, Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		and Inform FPIU/DSC, and take any action they require ensuring its removal or protection in-situ.			
3.20	Conflict with locals	Contractor shall ensure that mostly the local labourers are employed and migratory laborer shall be employed only in case of unavoidable circumstances.	Contractor	Engineer, F-PIU & PMU	Contractor
3.21	Environment Safeguard Officer	Contractor shall appoint one full-time suitably qualified and experienced Environment and Safety Officer who shall be responsible for assisting contractor in implementation of EMMP, community liaising, consultations with interested/affected parties, reporting and grievance redressal on day-to-day basis. This environment and safety officer will be at site till all works related to the project including demobilization are completed.	Contractor	Engineer, F-PIU & PMU	Contractor
4	**Operation and Maintenance impacts**				
4.1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise level, water (both ground, surface water) quality and soil,	Pollution Monitoring Agency appointed by IA	SDMA, PMU	KMVN /Dept. Of Tourism,

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		in the subproject area as suggested in pollution monitoring plan through an approved monitoring agency.			GoUK
4.2	Increased Pollution load on the Ecosystem in peak tourist season	Increased Pollution load will be addressed through better facilities. Wherever, possible Solid waste management shall be through local ULB system or other alternate measures. Trampling impacts on vegetation and soil will be minimized by designating proper walkways in and around proposed facilities. Proper parking facilities and traffic management for catering to increased vehicle movement shall be provided. The project (UEAP) will have positive impacts on the socio economic conditions of people of project area by way of providing better road connectivity, water supply & allied facilities Tourism Infrastructure and emergency rescue, evacuation facilities. As per Loan covenants of UEAP: a) EA shall prepare guidelines for new	IA, EA and Tourism Department	SDMA, PMU & GoUK	KMVN /Dept. Of Tourism, GoUK

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Fund Source
		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	KMVN/ Dept. Of Tourism, GoUK

EE= Environmental Expert of Engineer (DSC), DSC= Design & Supervision Consultants, IA= Implementing Agency, EA= Executing Agency, FPIU= Field Project Implementation Unit, KMVN= Kumoan Manadal Vikas Nigam

G. Performance Indicator

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

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 DSCs to be covered	Number of Sessions completed and Number of contractors, PIUs and DSCs.
14.	Implementation of EMP mitigation Measures	All items of Environmental Management Plan with timeline and	Implementation status of EMP items till date

		its respective regulatory standards like for Ambient air Quality – NAAQS, 2009 standards, Drinking water – IS:10500 etc, Residual Chlorine – UEPPCB standards and CPHEEO manual for handling.	
15.	Reporting	List and number of Report to be submitted	List and number of reports submitted

H. Grievance Redress Mechanism

147. The EA will establish a mechanism to receive and facilitate resolution of affected people concerns, complaints, and grievances about the Project's environmental performance. The project-specific grievance redress mechanism (GRM) is not intended to bypass the government's 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.

148. 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 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.

149. 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.

150. 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.

151. 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.

152. 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

153. 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.

154. 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.

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

156. 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.

157. 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 FRP 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.

158. 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.

159. 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).

Appendix I

ENVIRONMENT CATEGORIZATION

A. Instructions

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

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

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

B. Project Data

Country/Project No./Project Title	:	**Loan 3055 – IND Uttarakhand Emergency Assistance Project (UEAP)**
Department/ Division	:	Tourism Department, Government of Uttarakhand Sub-Projects: **Construction of FRP Huts**/Tented Accommodation in 05 most in affected Districts of Uttarakhand namely Chamoli, Rudraprayag, ashi, Uttarkashi, **Pithoragarh & Bageshwar**
Processing Stage	:	Sub-Project Appraisal Report (SAR) preparation
Modality	:	
[ ] Project Loan [ ] Program Loan [ ] Sector Loan [X] MFF [ ] Other financing modalities:		[ ] Financial Intermediary [ ] General Corporate Finance [√] Emergency Assistance [ ] Grant

C. Environment Category

[√] New [ ] Re-categorization – Previous Category [ ]

☐ Category A	{√} Category B	☐ Category C	☐ Category FI

D. Basis for Categorization/ Re-categorization (pls. attach documents):

[√] REA Checklist as **ANNEXURE A**
[ ] Project and/or Site Description
[ ] Other:

E. Comments

Project Team Comments:	**ESMC Comments:**
In Tourism Sector under ADB Emergency assisted UEAP, the construction of shelters and huts is proposed to restore climatic resilient tourism and assist disaster affected population, also considering the future preparedness to provide emergency evacuation shelters to tourists & pilgrims. The proposed project of **Construction Of FRP Huts in Kumaon region of Uttarakhand** falls under the 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 mitigated readily through EMP.	The Project Category as per ADB Safeguard Policy (SPS) 2009 is "B" and IEE is required.

F. Approval	
Proposed by: Field PIU Kumaon (Kumaon Mandal Vikas Nigam)	**Reviewed by**: Environment Safeguard Specialist, PIU Tourism - Environment & Social Management Cell (ESMC)
(Sign. of Deputy Team Leader, Field PIU Kumaon)	**(Sign. of Environment Safeguard Specialist, PIU Tourism)**
Date:	Date: 04/12/13
(Sign. of Team Leader, Field PIU-Kumaon-KMVN)	**Endorsed by: Additional Project Manager, PIU Tourism**
Date:	Date:
Endorsed by: Authorised Signatory, Field PIU Kumaon – KMVN Managing Director, Kumaon Mandal Vikas Nigam Ltd NAINI TAL	**Approved by: Project Manager, PIU Tourism**
Date:	**Chief Compliance Officer: The project is not coming under HCS.** Date:

Rapid Environmental Assessment (REA) Checklist
Construction Of FRP Huts: District Pithoragarh

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 the Director, RSES and for approval by the Chief Compliance Officer.

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

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

Country/Project Title: India /Loan 3055-IND Uttarakhand Emergency Assistance Project (UEAP) :**Construction of FRP Huts**/Tented Accommodation in 05 most affected Districts of Uttarakhand namely Chamoli, Rudraprayag, Uttarkashi, **Pithoragarh** & Bageshwar

Sector Division: Tourism Department, Government of Uttarakhand

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

*some sites are inaccessible due to calamity (landslides & road blockages) and onset of extreme winters

Screening Questions	Yes	No	Remarks
• deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	√		Minor deterioration anticipated during the construction activities. The Environmental Management Plan (EMP) provides mitigation measures to reduce the impacts Minor works involving installation of pre fabricated structures, hence no worker camps envisaged.
• increased air pollution due to project construction and operation?	√		During construction phase only minor amount of dust may arise which should be mitigated through water sprinkling, no other significant emission is expected as no use of heavy equipment is proposed and work involves installation of pre fabricated structures.
• noise and vibration due to project construction or operation?	√		Anticipated during the construction activities. The Environmental Management Plan (EMP) provides mitigation measures to reduce the impacts.
• disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
• poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS)from workers to local populations?		√	
• creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	
• social conflicts if workers from other regions or countries are hired?		√	
•large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
•risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		√	
•risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		√	
• community safety risks due to both accidental and natural causes, especially where the structural elements		√	FRP structures are designed to ensure safety of the community

REIA Checklist, UEAP PIU Tourism, FRP Huts

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?			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
▪ use of chemicals?		√	
▪ generation of wastewater during construction or operation?	√		Construction activities involve installation of pre fabricated structures only which does not involve much water usage During operation provisions for waste water management shall be ensured

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)?	√		Hazard prone area, hence structures are designed for ensuring resistance
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		√	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		√	
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		√	

Appendix III

Public Consultation Record

PUBLIC CONSULTATI ON RECORD
(जन–परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपतकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (GMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Gala Tourist Camp
Place of Public Consultation (जन–परामर्श हेतु चयनित स्थल)	:	Gala Tourist Rest House, KMVN.
Tehsil/ Village (तहसील / गांव)	:	Dharchula, / Gala (धारचूला / गाला)
District (जिला)	:	Pithoragarh (पिथौरागढ)
Date (दिनांक)	:	23/08/2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
①	Amar Singh Bisht	Farmer (किसान)	
(2)	Pradeep Bhakuni	Incharge KMVN	
(3)	Dharmendra Singh	Farmer (Porter)	
4.	Sindal Singh	Porter	
5.	Manoj Singh	"	
6.	Darpan Singh	Farmer	
7.	Sushil Ram Singh	"	
368 Ledger(s)			
8.	Madan Singh	"	
9.	Devi Singh	"	
10.	Indra Devi	"	

PUBLIC CONSULTATI ON RECORD
(जन–परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपतकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (GMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Budhi Yalm Camp.
Place of Public Consultation (जन–परामर्श हेतु चयनित स्थल)	:	Budhi Yalm Camp
Tehsil/ Village (तहसील / गांव)	:	~~Deedihat~~ Dharchula / Budhi (धारचूला / बुदी)
District (जिला)	:	Pithoragarh (पिथौरागढ़)
Date (दिनांक)	:	25/08/2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
(1)	Chandan Singh Rathore	Camp. Incharge. KMVN	
(2)	~~[illegible]~~ हरमल सिंह	चौकीदार, KMVN	हरमल सिंह
(3)	दीपक पन्त	KMVN	
(4)	हरीश रायपा	दुकानदार, बुदी	Harish
(5)	सुरेश रायपा	व्यवसायी.	Suresh
(6)	वसन्त रायपा	निवासी	वसन्त
(7)	सन्तोष कुटियाल	ग्रामवासी	सन्तोष
(8)	महेन्द्र कुटियाल	ग्रामवासी	Mahendra
(9)	नगत सिंह	पोर्टर	25/08/14

PUBLIC CONSULTATI ON RECORD
(जन-परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपतकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (GMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Kalapani Yatra Camp. KMVN
Place of Public Consultation (जन-परामर्श हेतु चयनित स्थल)	:	Kalapani Yatra Camp. (कालापानी)
Tehsil/ Village (तहसील / गांव)	:	Dharchula (धारचूला)
District (जिला)	:	Pithoragarh (पिथौरागढ)
Date (दिनांक)	:	26/09/2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
(1)	Dhan Singh Bisht	Incharge KMVN	
(2)	Digan Sing	KMVN	
(3)	नन्दन सिंह	Porter	
(4)	देवेन्द्र	Porter	
(5)	MANOJ BISHT	PORTER	
(6)	कुशाल सिंह	पोर्टर	
(7)	Ganesh Chaniyal	Mangor, Kalamuo	
(8)	भीम सिंह	पोर्टर	
(9)	धन सिंह	पोर्टर	
10	मनोज सिंह	Porter	

PUBLIC CONSULTATI ON RECORD
(जन-परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपातकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (OMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Gunji Yatra Camp
Place of Public Consultation (जन–परामर्श हेतु चयनित स्थल)	:	Gunji (गुंजी)
Tehsil/ Village (तहसील / गांव)	:	~~Kanalay~~ Dhanchula / Gunji (धारचूला / गुंजी)
District (जिला)	:	Pithoragarh (पिथौरागढ़)
Date (दिनांक)	:	27/08/2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
(1)	Devendra Chandola	Manager KMVN	Dchandola
(2)	Vinod Singh	Helper	Vinod Singh
(3)	Jaspal Singh Paiy	Construction	Jaspal
(4)	Prakash C. Arya	KMVN	
(5)	Mukesh Guntyal	Local Resident / Farmer	
(6)	Pramod Nagchiyal	Resident	Pramod.
(7)	Santosh Rayipa	Porter	
(8)	Partab Singh	Resident	

PUBLIC CONSULTATI ON RECORD
(जन-परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपतकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (GMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Kulli KMVN Camp
Place of Public Consultation (जन-परामर्श हेतु चयनित स्थल)	:	Kulli camp (कुटी यातना कैंप)
Tehsil/ Village (तहसील / गांव)	:	Dharchula (धारचूला / कुटी
District (जिला)	:	Pithoragarh (पिथौरागढ़)
Date (दिनांक)	:	27.08.2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
(1)	Mahendra Arya	KMVN employ	Mahendra
(2)	G. S. Vaulkoli	" employee	Gopal Si
(3)	Vinod Singh Sangar	Retirent	विनोद
(4)	रमेश चुनीयाल	Resident	रमेश
(5)	पुष्पेश पांगती	Farmer	पुष्पेश
(6)	कुशाल सिंह	Farmer	कुशाल
(7)	Maan Singh	Business person	Maan Singh
(8)	भगवान सिंह	& ग्रामीण	भगवान सिंह

PUBLIC CONSULTATI ON RECORD
(जन-परामर्श अभिलेख)

Name of the Project	:	Uttarakhand Emergency Assistant Programme (उत्तराखण्ड आपतकालीन सहायक परियोजना)
Project Package No.	:	UK/UEAP-T (GMVN)/DDN/O (ADB LOAN NO. 3055-IND)
Location to be improved (सुधार हेतु चयनित स्थल)	:	Sirkha village (सिरका गांव)
Place of Public Consultation (जन-परामर्श हेतु चयनित स्थल)	:	Sirkha / Pangu (सिरका एवं पांगू)
Tehsil/ Village (तहसील / गांव)	:	धारचूला (Dharchula)
District (जिला)	:	पिथौरागढ (Pithuragarh)
Date (दिनांक)	:	29-08-2014

List of the stakeholder/ Participant in Public Consultation
(जन सुनवाई में उपस्थित साझेदार/प्रतिभागी)

क्रम सं	Name & Address (नाम एवं पता)	Occupation (व्यवसाय)	Signature (हस्ताक्षर)
1	रूप सिंह	ट्रेकिंग गाइड	रूप सिंह
2	शेर सिंह	कृषि	शेर सिंह
3	बलवन्त सिंह	पिथौरागढ़	बलवन्त सिंह
4	पुष्कर सिंह	गाइड	पुष्कर सिंह
5	दीवान सिंह	गाइड	दीवान सिंह
6	हरक सिंह	किसान	हरक सिंह
7	डिगर सिंह	पिथौरागढ़	डिगर सिंह
8	हीरा सिंह	गाइड	हीरा सिंह
9	चायू सिंह	पिथौरागढ़	चायू सिंह
10	मोहन सिंह	किसान	मोहन सिंह
11	दान सिंह	पिथौरागढ़	दान सिंह
12	[illegible]	[illegible]	[illegible]
13	मनवर सिंह	KMVN.	Manwar

Appendix IV

Photographs of Public Consultation at different sites

Public Consultation at Gala

Public Consolation at Malpa

Public Consultation at Budhi

Public Consultation at Gunji

Public Consultation at Kaalapani and Nabhidhaang

Public Consultation at Sirkha and Paangu

Public Consultation at Kutti

Appendix V

Photographs of the sites and proposed land for FRP huts

Gala Yatra Camp

Proposed site for FRP construction at Gala

Malpa Yatra camp

Proposed site for FRP construction at Malpa

Budhi Yatra Camp

Proposed site for FRP construction at Budhi

Gunji Yatra camp

Proposed site for FRP construction at Gunji

Kalapani Yatra Camp

Proposed site for FRP construction at Kalapani

Nabidhang Yatra Camp

Proposed site for FRP construction at Nabhidangh

Kutti Yatra camp

Proposed site for FPR construction at Kutti

Sirkha Yatra Camp

Proposed site for FRP construction at Sirkha

Paangu Yatra Camp

Proposed site for FRP construction at Paangu

Appendix VI

MoEF&CC revised specific guidelines in 23 June, 2014 for State of Uttarakhand for expediting forest clearances to carry out the emergency work in forest areas (excluding works in national parks and sanctuaries)

F. No. 11-298/2013 FC
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)
*****

Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi - 110 003
Dated: 23rd June, 2014

To

The *Principal Secretary (Forests)*,
Government of Uttrakhand,
Dehradun

Sub: General approval under Section 2 of the Forest (Conservation) Act, 1980 for diversion of forest land for restoration/reconstruction including realignment of roads damaged in the recent floods and construction of helipads and ropeways in flood affected areas in Uttarakhand.

Sir,

I am directed to refer to this Ministry's letter of even number dated 24th July 2014 on the above-mentioned subject wherein this Ministry keeping in view the urgent necessity to restore and strengthen the communication network in flood affected districts in Uttarakhand accorded general approval under section - 2 of the Forest (Conservation) Act, 1980 for a period of one year for diversion of forest land, not more than one hectare in each case, for restoration/reconstruction including realignment, by the Government Departments, of roads/ bridges damaged in the floods and construction of helipads and ropeways in flood affected areas in Uttarakhand subject to fulfillment of conditions stipulated in the said letter.

This Ministry has received requests to extend the said general for a further period and also to extend the same to diversion of forest land up to 5 hectares of forests land in each case, for restoration/reconstruction including realignment, by the Government Departments, of roads/ bridges damaged in flood affected districts in Uttarakhand.

Accordingly, after detailed examination of the matter, the Central Government, hereby accords general approval under section 2 of the Forest (Conservation) Act, 1980 for a period of one year with effect from 24th July 2014 for diversion of forest land, not more than five hectares in each case, for restoration/reconstruction including realignment, by the Government Departments, of roads/ bridges damaged in the recent floods and, and diversion of forest land not more than one hectare in each case for construction of helipads and ropeways in flood affected areas in Uttarakhand, subject to fulfillment of the following conditions:

(i) General approval shall be applicable for restoration/reconstruction including realignment of the existing roads/bridges damaged by the recent floods and construction of helipads and ropeways only. Use of forest land for construction of new roads will be governed by the existing provisions;

(ii) User agencies shall explore all feasible alternatives to minimize use of forest land for restoration/ reconstruction including realignment of roads/ ropeways. Additional forest land to be used for restoration/ reconstruction including realignment of existing

roads/bridges and construction of new helipads and ropeways shall be restricted to the bare minimum and shall be used only when it is unavoidable. The concerned Divisional Forest Officer shall certify to this effect;

(iii) Additional forest land utilized for restoration/reconstruction including realignment of a stretch of road/ bridge shall not be more than 5.00 hecatres. Similarly, forest land utilised for construction of helipads and ropeways shall not be more than 1.00 hectare in each case;

(iv) Revised alignment of each stretch of the road/ bridge and location of each helipad and ropeway shall be jointly finalized by the representative of the user agency and the State Forest Department;

(v) Legal status of the forest land shall remain unchanged;

(vi) The user agency shall submit the project proposal to the state/UT Government in the prescribed i.e. Form –A as provided in Rules -6 of the Forest (Conservation) Rules, 2003;

(vii) State Government shall accord approval to the proposal duly recommended by Principal Chief Conservator of Forests;

(viii) Project site should be outside Protected Areas;

(ix) Nodal Officer, the Forest (Conservation) Act, 1980 shall submit monthly report to the concerned Regional Office by 5th of every month regularly regarding approval of such cases. In the event of failure, the exercise of power by the State Government to grant such permission may be suspended by the Central Government for a specified period of time or till the information is submitted;

(x) User agency shall plant and maintain two times the number of trees felled on the diverted land to maintain the green cover at the project cost. Planting site for the purpose will be identified by the State Forest Department (Preferably within or in the surrounding area of the project). Only indigenous forest tree species shall be used for such plantations. Trees, if planted on the diverted area, will not be felled without the permission of the State Forest Department;

(xi) User agency shall be responsible for any loss to the flora/fauna in the surroundings and therefore, shall take all possible measures to conserve the same;

(xii) User Agency shall pay the Net Present Value (NPV) of the diverted forest land at the rates stipulated by the Ministry of Environment and Forests from time to time;

(xiii) Permission accorded by the State Government shall be subject to the monitoring by the concerned Regional Office of this Ministry;

(xiv) The forest land shall not be used for any purpose other than that specified in the proposal. Any change in the land use without prior permission of the Central

Government shall amount to the violation of Forest (Conservation) Act, 1980. Request of such changes shall be made to the Regional Office by the Nodal Officer (Forest Conservation) of the State.

(xv) The State Forest Department /State Government or the concerned Regional Office, may impose from time to time any other condition in the interest of conservation, protection and /or development of forests.

(xvi) **This general approval shall be valid till 23rd July 2015.**

Yours faithfully,

(T. C. Nautiyal)
Director

Copy To:-

1. Prime Minister's Office (*Kind attn.*: Shri Santosh D. Vaidya, Director), South Block, New Delhi for kind information.
2. The Cabinet Secretariat, (*Kind attn.:* Shri Murali Bhavaraju, Under Secretary), Rashtrapati Bhawan, New Delhi. New Delhi for kind information.
3. The Secretary, Ministry of Home Affairs, New Delhi for kind information.
4. The Principal Secretary, Public Works Department, Government of Uttrakhand, Dehradun.
5. The Principal Chief Conservator of Forest, Government of Uttarakhand, Dehradun.
6. The Nodal Officer, the Forest (Conservation) Act, 1980, Government of Uttarakhand, Dehradun.
7. Regional Office (North Central Zone), Ministry of Environmental and Forests, Government of India, Dehradun.
8. All Assistant Inspector General of Forests/ Directors in the Forest Conservation Division MoEF.
9. The Director, Regional Office Headquarters Division, MoEF.
10. Sr. PPS to DGF&SS, MoEF.
11. Sr. PPS to Addl. DGF (FC), MoEF.
12. PS to IGF (FC), MoEF.
13. Guard File.

(H. C. Chaudhary)
Director