Initial Environment Examination

Project Number: 47229-001
June 2016

IND: Uttarakhand Emergency Assistance Project (UEAP)

Package: Phase V - Civil Aviation Program Package No. UK/UEAP-CA/P5

Submitted by

Project implementation Unit –CA (Civil Aviation), Dehradun

Asian Development Bank

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GM/AS

Project Implementation Unit

Uttarakhand Emergency Assistance Project (Civil Aviation Program)

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Letter No.: 397/PIU-CA/UEAP/2015-16 Dated: 14/03/2016

To,

The Country Director
South Asia Department,
India Resident Mission (ADB),
4 San Martin Marg, Chankyapuri,
New Delhi: 110021, India

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Subject: Loan 3055 IND – Uttarakhand Emergency Assistance Project (UEAP); Submission of 'IEE' Reports for Gunji (Phase-IV) & Milam (Phase-V) under Civil Aviation

Dear Madam,

With reference to above mentioned subject, kindly find herewith attached Initial Environmental Examination (IEE) Reports for Construction and Upgradation of 02 Helipads and Heliports under UEAP Phase-IV and Phase-V for your kind approval.

Enclosure: 'IEE' Reports of Phase-IV & Phase -V Program

Yours Sincerely,

(Dr. R. Rajesh Kumar)
I/C
Program Manager

Copy to:

1. Program Director, PMU (UEAP), SIDCUL Building, IT Park, Sahastradhara Road, Dehradun.
2. Team Leader, M/s IIDC Consultants Pvt. Ltd. Race Course, Dehradun.

Program Manager

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Initial Environmental Examination (IEE)

March 2016

India: Construction of one Helipad in Pithoragarh District of Uttarakhand under Uttarakhand Emergency Assistance Project
[Phase – V: Civil Aviation Programme Package No. UK/UEAP-CA/P5]

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

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

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

Abbreviations

ADB	Asian Development Bank
CA	Civil Aviation
CFE	Consent for Establishment
CFO	Consent for Operation
CPCB	Central Pollution Control Board
DoT	Department of Tourism
DSC	Design and Supervision Consultant
dB	Decibel
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EC	Environmental Clearance
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
FATO	Final Approval and Take Off Area
GoI	Government of India
GoU	Government of Uttarakhand
GRC	Grievance Redressal Committees
Ha	Hectare
IAF	Indian Air Force
IEE	Initial Environmental Examination
ITBP	Indo-Tibetan Border Police
JRDNA	Joint Rapid Damage and Needs Assessment
Leq	Sound Level
MoEFCC	Ministry of Environment, Forests and Climate Change
NAAQM	National Ambient Air Quality Monitoring
NDRF	National Disaster Response Force
NGO	Non Government Organisation
NOC	No-Objection Certificate
O&M	Operation and Maintenance
PIU	Project Implementation Unit
PMU	Project Management Unit
PWD	Public Works Department
REA	Rapid Environmnetal Assessment
SAR	Sub-Project Appraisal Report
SEIAA	State Environmental Impact Assessment Authority
SDMA	State Disaster Management Authority
SPCB	State Pollution Control Board
SPS	Safeguard Policy Statement
UCADA	Uttarakhand Civil Aviation Development Authority
UEAP	Uttarakhand Emergency Assistance Project
UEPPCB	Uttarakhand Environmental Protection and Pollution Control Board
UJS	Uttarakhand Jal Sansthan
VECs	Valued Environmental Components

WEIGHTS AND MEASURES

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

NOTE(S)

In this report, "$" refers to US dollars.
"INR" and "■" refer to Indian rupees

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EXECUTIVE SUMMARY

1. Uttarakhand lies in the northern part of India amidst the magnificent Himalayas and dense forests. The State is bordering Himachal Pradesh in the north-west and Uttar Pradesh in the South and shares international borders with Nepal and China. The State is comprised of 13 districts divided into two regions and also called administrative divisions; the Kumaon and Garhwal. The region is traditionally referred to as Uttarakhand in Hindu scriptures and old literature, a term which derives from the Sanskrit for Northern Country or Section. Uttarakhand by virtue of its geographical setting is vulnerable to minor ecological changes. Hence any activity disapproved by mountain ecosystem triggers a disaster. We cannot stop disaster to happen but can certainly take some steps to reduce its effects. Disasters are synonymous to damage of property, life and psyche of the people. If disasters cannot be averted, then reduction of losses of any type, caused by disaster becomes a focal point of the policy for disaster. So far, in the recent June, 2013 Uttarakhand has experienced major natural calamities in five main districts Rudraprayag (especially Kedarnath), Chamoli, Uttarkashi, Bageshwar and Pithoragarh (Dharchula).
2. Being part the Himalayan region, Uttarakhand is a disaster prone state. Landslides, forest fires, cloudbursts and flash-floods are seasonal in nature and this strike at a certain period of the year with high frequency. Natural disasters in the mountains are the most devastating and are unpredictable. Natural disaster of June 2013 resulted in huge damage of life, roads, tourism assets/infrastructure, rural & urban infrastructure in the state of Uttarakhand. This event also recorded a glacial lake burst/overflow related flash flood at Kedarnath causing a great number of loss of lives and severe damage of property enroute.
3. The Government of Uttarakhand (GoU) launched a massive emergency rescue and evacuation operation with assistance from the Indian Army, Indian Air Force (IAF), Indo-Tibetan Border Police (ITBP), the National Disaster Response Force (NDRF) and the local Police evacuating more than 110,000 people from these flood affected areas. The need to immediately start the recovery and reconstruction work, especially in the most affected areas prompted the need for a rapid assessment to understand the nature of damages post-disaster. The Uttarakhand Government is committed to ensure the safety and well-being of its people and recognizes the necessity to continuously improve disaster risk reduction and management within the State.
4. Natural Disaster of June, 2013 has resulted in huge loss of lives of tourists/residents and severe damage to infrastructural facilities in the region, highlighting the requirement to strengthen the disaster preparedness by creating proper rescue/relief/evacuation mechanism through aerial route in such eventualities in the difficult Himalayan terrain.
   Presently 1 sub-project is being undertaken in Phase – V. The No-Objection Certificates (NOCs) for one sub-project (helipad) has been obtained from the concerned authorities (District Magistrates). This proposed sub-project location exists in Pithoragarh district of Uttarakhand State.
5. One sub-project in UEAP (Phase – V) as H4 category
6. Consistent with the Environmental Assessment and Review Framework, the proposed sub-project were screened using ADB rapid environmental assessment (REA) checklist. The environmental screening revealed that no protected or sensitive areas were traversed. All impacts are site specific; few are irreversible and can be readily mitigated supporting an environmental "Category B" classification. The description of subproject is as follows:
   Milam: Milam is the last village situated in Johar valley of Pithoragarh district in the state of Uttarakhand, India. The river Gori Ganga originates from Milam Glacier and flows past

the village to meet with Kali ganga at Jauljibi. Milam is on a route over high mountain passes (Unta Dhura, Jandi Dhura and Kingribingri Dhura) to Gyanima mandi in Tibet. The site is already being used for operation of helicopters. Site Elevation is 1175 m amsl. So the subproject is the Renovation of the existing helipad to H4.

7. **Air Quality.** The pristine environment and sparse population suggest that most part of the State have a very good air quality.The baseline data related to ambient air quality and noise level will be generated before commencement of civil work/construction.
8. **Seismicity**. The State constitutes one of the most active domains of the Himalayan region. Several damaging earthquakes are recorded from this region. As such, the region is classified under high seismic zones V.
9. **Forest.** Uttarakhand is ranked 9th in all-India in terms of forest covered area with 24,508 km^2 of forest land *(As per State Forest Report 2013)*. The district of Pauri Garhwal, Uttarkashi, Nainital, and Chamoli have the highest forest cover accounting for 50% of all the state's total.
10. **Sensitive Ecosystem.** The sub-project location is not located within or falls within any sensitive ecosystem. Neither the project component has direct or indirect intervention with sensitive ecosystem.
11. **Significant Environmental Impacts and Proposed Mitigation Measures.** No environmental impacts related to siting were identified in the environmental examination. The proposed sub-project is not located within or adjacent to the cultural heritage sites, protected areas, wetlands, mangroves, estuarine; core as well buffer zones of the protected areas or any special area for protecting biodiversity. There are no rare, threatened, and endangered species (flora and fauna) within the sub-project sites. The potential significant environmental impacts identified and assessed are related to construction time impacts.
12. **Information Disclosure, Consultation, Participation, and Grievance and Redress Mechanism.** Wide stakeholders 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 on ADB website pursuant to the Bank's *Public Communication Policy* and in the SDMA website.
13. **Environmental Management Plan.**The Environmental Management and Monitoring Plan (EMMP), to form part of the bidding documents, adopted the procurement package scheme and facilitate subsequent compliance monitoring by the contractor.
14. **Conclusion.** The initial environmental examination (IEE) 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 and EMoP is included in 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. The IEE is based upon the EARF, which is in consistent with the ABD's Safeguard Policy Statement (SPS) 2009. The sub-project is classified as Category "B" for Environment and do not require further EIA study. In the present IEE certain baseline data is not available for ambient air quality, water quality and noise level. Therefore, it is proposed that before the commencement of civil work, sampling for these parameters shall be conducted.

I. INTRODUCTION

A. Project Background/Rationale

1. Recent disaster of unprecedented floods in June, 2013 in the state of Uttarakhand, devastated many towns and villages on the banks of rivers Mandakini, Bhagirathi, Pindar, Alaknanda, Kali and Saryu. Infrastructure facilities like roads & bridges, 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. Uttarakhand Emergecy Assistance Project (UEAP)

2. 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 habitations and 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.
3. The Natural Disaster of June, 2013 has resulted in huge loss of lives of tourists/local residents and severe damage to infrastructural facilities in the region, highlighting the requirement to strengthen the disaster preparedness by creating proper rescue/relief/evacuation mechanism through aerial route in such eventualities in the difficult Himalayan terrain.
4. Based on the request of India, a Joint Rapid Damage and Needs Assessment (JRDNA) was undertaken by Asian Development Bank (ADB) and the World Bank. ADB agreed to assist the Government of India (GOI) with reconstruction and rehabilitation efforts for which the Uttarakhand Emergency Assistance Project (UEAP) has been formulated as a multi-sector emergency loan in sector loan modality. The executing agency (EA) for the UEAP will be Government of Uttarakhand (GoU) and State Disaster Management Authority (SDMA). The primary implementing agencies (IAs) will be Public Works Department (PWD) for roads & bridges, and trekking routes including eco-trails, The Department of Tourism (DoT) for tourism infrastructure, Uttarakhand Civil Aviation Development Authority (UCADA) for helipads; and Uttarakhand Jal Sansthan (UJS) for urban water supply, or any successor hereto. Some other state agencies such as Forest Department. Kumaon Mandal Vikas Nigam Limited, and Garhwal Mandal Vikas Nigam Limited are likely to be entrusted with some works under UEAP under these primary IAs.

   While the disaster affected almost all districts within the state, the main focus of the assessment was on five districts that were most affected: Bageshwar, Chamoli, Pithoragarh, Rudraprayag, and Uttarkashi. However, to strengthen the disaster preparedness capability and to restore visitor's faith/confidence in the tourism safety through provision of better connectivity and presence of rescue, relief, and evacuation mechanisms, as per the indicative list of sub-projects in PAM under "Section - II". Tourism Amenities and Helipads" and its Sub-section 1. The main theme of PIU (CA) is to "Construction and Upgradation of Helipads, Heliports or Helidromes in the state of Uttarakhand. Presently in Phase-V, one such helipad has been identified in Pithoragarh

District of Uttarakhand under UEAP (Phase –V: Civil Aviation Program). This would be constructed under H4 category of helipads.

C. Purpose of the Environmental Assessment

5. The main purpose of this IEE is to provide environmental assessment of the proposed construction and upgradation of the Helipads, Heliports and Helidromes with associated facilities. The purpose of this 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.
6. The Objectives of this Initial Environmental Examination (IEE) are as follows:
   - Assess the existing environmental conditions in the sub-project locations including the identification of environmentally sensitive areas and valued environmental components (VECs).
   - Assess the proposed planning and developmental activities to identify their potential impacts, evaluate the impacts, and determine their extent.
   - Assess the compliance with ADB's environmental safeguard requirements and applicable environmental laws of GOI & GOU.
   - To incorporate environmental mitigation measures in the project design and preparation of environmental management and monitoring plan (EMMP) for the project.
7. This IEE has been carried out to ensure that the potential adverse environmental impacts are appropriatly addressed in line with *ADB Safeguard Policy Statement, 2009.*

D. Extent of IEE

8. 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 upgradation of the project component. IEE also covers the indirect impacts of the sub-project components. Assessment is carried out for all components of environment covering terrestrial and aquatic ecology, soil, water, noise and socio-economic aspects.

E. Contents of IEE

9. The IEE has been largely structured as per SPS, 2009 ADB's Environmental Assessment Guidelines (2003) and environmental safeguards. Following this introduction of this report contains seven more sections including (ii) Policy, Legal and Administrative Framework, (iii) Description of Project, (iv) Description of the Environment, (v) Anticipated Environmental Impacts and Mitigation Measures, (vi) Information Disclosure, Consultation, and Participation, (vii) Environment Management Plan and Grievance Redress Mechanism, and (viii) Conclusion and Recommendation. This IEE is based on field reconnaissence surveys, secondary sources, 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

10. The overall methodology for the Environmental Examination comprises the following stages:
    (A) Field reconnaissance survey to assess the sub-project locations simultaneously to identify the critical environmental attributes.
    (B) Stakeholders Meeting and Preliminary Public Consultation to get their feedback related to sub-project.
    (C) Collection and review of readily available secondary data (informations, khasra khatoni and revenue maps etc.) especially from Revenue and Forest Departments.
    (D) Superimposing technical data on the design aspects over baseline status to identify the nature of potential negative impacts and suggesting feasible mitigation measures for minimization of those impacts
    (E) Identification of method, implementation of suggested mitigation measures and environmental monitoring to develop an Environmental Management and Monitoring Plan (EMMP).
    (F) Preparation of Environmental Safeguard Reports such as IEE, EIA, EMP and Recommended Mitigation Measures as per project need.
11. All above mentioned tasks and sub-project feasibility were assessed based on the Rapid Environmental Assessment (REA) Checklist (*i.e.* Checklist 2D General).
12. The reconnaissance survey of the sub-project locations was undertaken to determine the existing status of the various 'Valued Environmental Components' (VECs) of the area. The baseline data was collected from primary as well as secondary sources. The different environmental components such as physical, environmental and ecological resources such as topography, geology, hydrology, climate and land use, flora and fauna were studied in detail to establish the baseline conditions. The objectives of reconnaissance survey are described below.
    - *To provide information about general baseline environmental setting of the project area with respect to the physical environment and ecological resources in the project specific location..*
    - *To identify and collect various informations on potential impacts of sub-project and the characteristics of the impacts in terms of pre-construction, construction and operation phases of the project.*
    - *To determine strategy for formulation of EMMP.*
    - *To determine and use of sustainable methods and appropriate technologies for minimization of environmental as well as social impacts as far as possible.*

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

13. 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.
14. Specifically for the Uttarakhand Emergency Assistance Project (UEAP: ADB), the following environmental laws and regulations are applicable (***Table II - 1***).

Table II-1: Applicable Environmental National and State Requirements for UEAP (ADB)

Sl.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Sub-project	Concerned Agency	Applicable to Contract	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.	State Environmental Impact Assessment Authority (SEIAA). If not constituted then MoEF.	No	No	Not required
2	Forest Clearance for felling of trees and acquisition of forest land.	As per the Forest Conservation Act (1980): (i) If the forest land exceeds 20 ha then prior permission of Central Government is required; (ii) If the forest land is between 5-20 ha, then permission form the Regional Office of Chief Conservator is required; (iii) If the forest land is below or equal to 5 ha land, the State Government may give permission. (iv) 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. Besides these conditions: (v) Uttaranchal Van- Panchayat Rules (2005)	District Level Committee constituted by the State Govt. Van-Panchayat is a local level body, which is advised by the Forest Department. The NOC in this regard is issued by the Concerned Vanpanchayat Sarpanch, Chairman (Municipality) and District Magistrate.	No No	PIU (UEAP: CA) PIU (UEAP: CA)	Not Required Not Required
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 etc. 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.	Protected Area Authority and Wildlife Board	No	No	Not Required

Sl.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Sub-project	Concerned Agency	Applicable to Contract	Responsibility	Status of Compliance
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.	Archaeological Survey of India	No	PIU (UEAP: CA)	Not required
5.	Bhagirathi Eco-sensitive Zone Notification	The maintenance of Environmental flow and ecology of the River Bhagirathi from Gaumukh to Uttarkashi with total area of 4179.59 km^2 covering the entire watershade of about 100 km stretch of the river Bhagirathi shall be declared as Eco-sensitive Zone from ecological and environment point of view.	Ministry of Environment, Forests and Climate Change	No	No	Not Required
6.	Doon Valley Notification	The Central Government hereby imposes restrictions on the following activities in Doon Valley, bounded on the North by Mussorie ridge, in the North-East by Lesser Himalayan range, on the South-West by Shivalik ranges, river Ganga in the South-East and river Yamuna in the North-West, except those activities which are permitted by the Central Government for examining the environmental impacts.	Ministry of Environment, Forests and Climate Change	No	No	Not Required
B. Construction Stage						
1.	Discharge of waste water	The Water (Prevention and Control of Pollution) Act 1974 and The Water (Prevention and Control of Pollution) Rules 1975. The Act and Rules outlines the activities which are prohibited on account of their potential to cause water pollution. Pollution from various sources needs to be controlled as per this Act and Rules.	Uttarakhand Environmental Protection and Pollution Contro. Board, Dehradun	Yes	Civil Work Contractor	Contractor will obtain prior approva (if required)
2	Permission for Sand Mining from river bed	Mines and Minerals (Regulation and Development) Act, 1957 as amended in 1872.	River Board Authorities/ Department of Mining Govt. of Uttarakhand	Yes	Civil Work Contractor	Contractor will obtain prior approva from the concerned authority.
3	Consents to establish & operate Hot and Batch	Air (Prevention and Control of Pollution) Act 1981	Uttarakhand Environmental Protection and Pollution Control	Yes	Civil Work Contractor	

Sl.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Sub-project	Concerned Agency	Applicable to Contract	Responsibility	Status of Compliance
	Mixing Plants & Stone Crushers.		Board – Dehradun			
4	Authorization for Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989 as amended 2003	Uttarakhand Environmental Protection and Pollution Contro Board – Dehradur	No	Civil Work Contractor	Not required
5	Consent for Disposal of Sewage from Labour camps	Water (Prevention and Control of Pollution) Act 1974	Uttarakhand Environmental Protection and Pollution Control Board – Dehradun	No	Civil Work Contractor	Not required
6	Use of Fly ash within 100 kms around Thermal Power plants	Fly Ash Notification, 1999 & its amendment in 27 August 2003.	MoEFCC	No	Civil Work Contractor	Not required
7	Pollution Under Control Certificate	Central Motor and Vehicle Act. 1988	Department of Transport. Govt of Uttarakhand	Yes	Civil Work Contractor	Contractor will obtain prior approval before start of Construction work.
8	Installation of Generators	The Air (Prev. & Con. of Pollution) Act, 1980	Uttarakhand Environment Protection and Pollution Control Board - Dehradun	Yes	Civil Work Contractor	-
9	Employing Labour/workers	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996,	District Labour Commissioner	Yes	Civil Work Contractor	Contractor will obtain the Labour licence before commencement of Civil work
10	Permission for extraction of boulder and sand from river beds	Mines & Minerals (Regulation and Development) Act 1957 and its amended in 1972	Department of Mines and Geology. Government of Uttarakhand	No	Civil Work Contractor	Not required
11	License for Storing Diesel and other	Petroleum Rules, 2002 Hazardous Waste (Management and Handling) Rules	Commissioner of Explosives and	No	Civil Work Contractor	Not required

Sl.No	Clearances	Acts/Rules/Notifications/Guidelines and Application to Sub-project	Concerned Agency	Applicable to Contract	Responsibility	Status of Compliance
	explosives	1999.	Uttarakhand Environmental Protection and Pollution Control Board, Dehradun			
C. Implementation Stage						
1	Consent to Establish & Cosent to Operate for Installation of Generators	The Air (Prev. & Con. of Pollution) Act, 1980	Uttarakhand Environment Protection and Pollution Control Board, Dehradun	Yes	PIU (UEAP: CA)	

III. DESCRIPTION OF THE PROJECT

A. Project Location

This helipad for Phase – V along with the category of helipad is given in ***Table III-1-2*** and ***Figure-1*** for the location of the site.

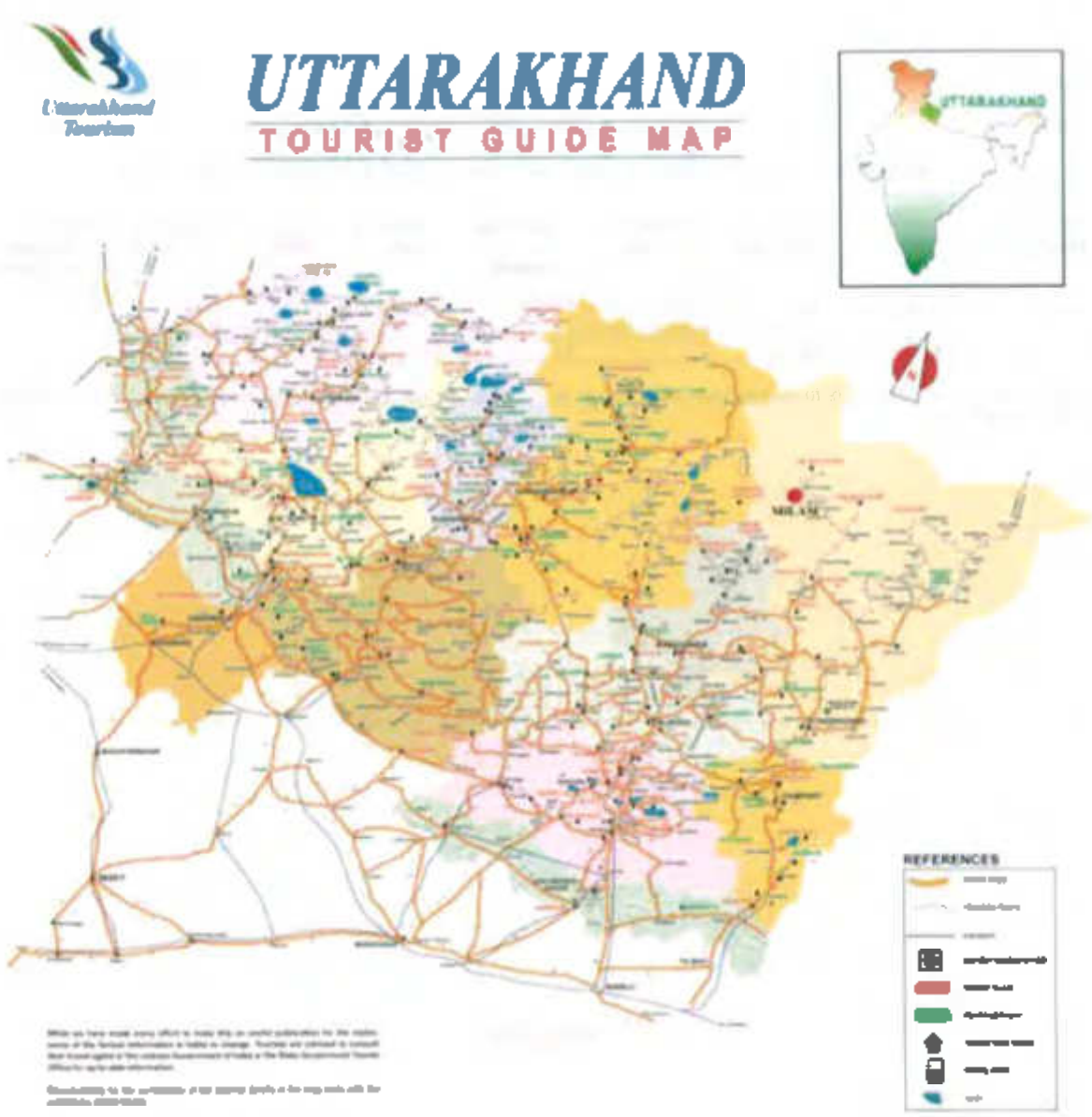


Figure 1: Map Showing Locations for Proposed Helipads at Milam

Table III-1: Details of Helipad to be Renovated and Upgraded in Phase – 4 (UEAP: ADB)

Sl. No.	Sub-Project Location	District	Category Proposed	Geographical Location	Total Area (m^2) available	Status of Land	Status of NOC	Diversion of Forest	Status of Environmental & Social (R&R) issues
1.	Milam	Pithoragarh	H4 (2500 m^2)	30°25'53.00"N 80°09'17.00"E	2500	Government	NOC obtained	No	No
TOTAL		***1***	***H4=1***		-	-	**1**	-	-

Note: The area given in the above table refers to the total area under owners at that particular site. Out of that land the proposed category of Helipad to be developed as per the requirement.

The disaster preparedness area coverage is for pilgrim destinations of parts of "Char Dham Circuit," namely Chamoli district being home to Badrinath, while Rudraprayag district is home to Kedarnath, and some other tourism destinations and settlements; as well as tourism destinations and settlements in the other 6 districts of the Uttarakhand that needs to be supported with enhanced disaster preparedness measures.

Table III-2: Categorization of Helipads, Heliports or Helidromes and its requirements

Sl. No.	Category	Capacity	Area required as per the Category (m^2)	No. of proposed
1.	Helidrome (H1)	1 MI-17 plus parking for 4 light choppers	10,100 m^2	-
2.	Heliport (H2)	1 MI-17 plus parking for light 2 choppers	8,030 m^2	-
3.	Helipad (H3)	1 MI-17 or 2 Light choppers	4,800 m^2	-
4.	Helipad (H4)	1 Light chopper	2,500 m^2	1
	Total			1

B. Proposed Category of the Project

17. Pursuant to the requirements of the ADB Safeguard Policy Statement (2009) proposed "Construction of Helipads, Heliports or Helidromes with associated facilities" 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 Uttarakhand Civil Aviaition Development Authority (UCADA). Consistent with the Environmental Assessment and Review Framework (EARF), the sub-project was screened using the ADB rapid environmental assessment (REA) checklist.
18. 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 sub-project 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

i. Milam (District – Pithoragarh)

19. Milam is the last village situated in Johar valley of Pithoragarh district in the state of Uttarakhand, India. The river Gori Ganga originates from Milam Glacier and flows past the village to meet with Kali ganga at Jauljibi. Milam is on a route over high mountain passes (Unta Dhura, Jandi Dhura and Kingribingri Dhura) to Gyanima mandi in Tibet. The site is already being used for operation of hellcopters. Site Elevation is 1175 m amsl. So the subproject is the Renovation of the existing helipad to H4.
20. The sub-project is not located within or adjacent to the core and buffer zones of any national park, wildlife sanctuary, biosphere reserve and other critically environmental habitats such as wetlands, eco-sensitive zone (ESZ) *etc*. The proposed site is located at a distance of about 300 meter from River Gori Ganga. Scope of proposed work is confined to construction of a concrete base (2500 sq m) for landing of helicoptors and thus no adverse impact is anticipated on water quality of River Gori Ganga due to construction of H4 category helipad at the site.

Plate 1: Proposed location for renovation of Helipad at Milam

D. Project Implementation Schedule

21. The implementation period for the UEAP is upto March 2017.

E. Technical Specification

22. The following points are considered for designing of these helipads or heliports:
    a. For calculating the helipad/heliport sizes paved area & load bearing strength, following points have been taken in to consideration:
        I. Critical Design Helicopter: MI-17 helicopter (Overall length - 25.35 m; Maximum Take-Off Mass (MTOM)–13 Tons) has been considered as critical design helicopter for these helipads/heliports.
        II. Light Helicopter: An average overall length of 13 meters for light helicopters has been considered.
        III. Helipads (H4 Category): Helipads have been considered for one light chopper only.
        IV. Helipads (H3 Category): Helipads have been considered for one MI-17 or two light choppers/helicopters.
        V. Heliports (H2 Category): Heliports have been considered for one MI-17 and two light-weight helicopter operations.

    Since these helipads or heliports are also being constructed to cater for an emergency due to cloud burst, flush floods, earthquakes or any other natural calamities, then in these situations the helicopter may be required to touch down and lift-off from any place on the concrete area keeping the safety factors in to account. In view of this, the complete concrete area has been considered for the same strength as required for Touchdown and Lift-Off (TLOF) area. Keeping the safety factor in to consideration, load bearing capacity of 15 Tons has been taken in to account for the complete paved area.

    b. Considering the above mentioned points the following "Paved Area" sizes of the helipads/heliports under this SAR has been calculated for design purpose:

(i) Helipad (H4)

(a) Ideal Size FATO : 30 m x 30 m

	(b)	**Minimum Acceptable size FATO**	:	**20 m x 20 m**
	(c)	Load Bearing Capacity	:	10 tons (1.66 x 5500 Kg)
(ii)	**Helipad (H3)**			
	(a)	Ideal Size FATO	:	50 m x 50 m
	(b)	**Minimum Acceptable Size FATO**	:	**50 m x 40 m**
	(c)	Load Bearing Capacity	:	10 tons (One stand apron) & FATO 22 ton (1.66 x 13)
(III)	**Heliport (H2)**			
	(a)	Ideal Size FATO	:	40 m x 80 m
	(b)	**Minimum Acceptable size FATO**	:	**40 m x 50 m**
	(c)	Load Bearing Capacity	:	13 tons (Two stand apron) & FATO 22 tons (1.66 x 13)

c. In addition to the above the following points are to be considered while designing the helipads/heliports:

(i) A "Safety Area" of 10 meters all around the paved area of FATO shall be considered. The safety area should be obstruction free, well drained, level, free from stones and debris. Good quality of grass to be planted on the safety area to suppress any dust rise, flying debris due to rotor down wash. The safety area surface shall be suitable for any forced landing.

(ii) The "Slopes" on the paved area shall be sufficient to prevent accumulation of water on the surface, but shall not exceed 3 percent in any direction. The locationwise technical specification of the sub-project is given below.

Table III-3: Technical Specification of the Sub-Project (helipad)

Sl. No.	Sub-Project	Districts	Category	Minimum Area Available for construction (m^2)
1.	Milam	Pithoragarh	H4	2500

** FATO: 20 m x 20 m and Safety Area: 10 m around FATO*

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

23. This section presents a brief description of the existing environment including its physical, ecological resources, and socio-economic development of the Sub-projects. Broad aspects on various environmental parameters such as geography, geology, physiography, climate, meteorology, seismology, ecology, socio-cultural and economic developmental parameters on one hand and information to be compiled from relevant government agencies like the Forest Department, Wildlife Department, State Environment Protection, and Pollution Control Board and Metrological Department etc.

1. Geography

24. 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, Bageshwar, 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 geographical area of 53,483 Km^2 and a population of about 1.01 crore as per census 2011.

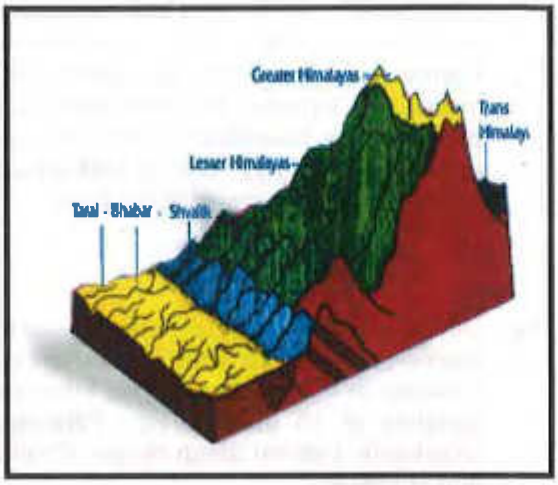
Figure 2: Location of Districts in Uttarakhand

25. Uttarakhand is divided into two regions and also called administrative divisions, basically following terrains: the Kumaon and Garhwal. The Kumaon division located southeast of the state and composed of Almora, Bageshwar, Champawat, Nainital, Pithoragarh, and

Udham Singh Nagar. The Kumaon region is part of the vast Himalayan track and the sub-mountains of Terai and Bhabhar. The region is drained by Gori, Dhauli, and Kali from the Tibetan mountains, and Pindari and Kaliganga which ultimately joins Alaknanda River. The Garwhal division is composed of Chamoli, Uttarkashi, Rudraprayag, Tehri Garhwal, Pauri, Dehradun, and Haridwar districts.and is entirely on rugged mountain ranges dissected by valley, and deep gorges. The Alaknanda River, the main source of the Ganges, traces its headwaters in this region.

26. The State is part of the Western Himalaya. Geographically, the Kumaon zone of the Western Himalaya can be divided into four zones *viz.*

(A) Tarai-Bhabar-Shivalik (Sub-Himalayas)
(B) Lesser-Himalayas
(C) Greater-Himalayas
(D) Trans-Himalaya (Tethys)



South of Lesser Himalayas, it is the outermost zone overlooking the foot-hills and the plains. The altitude ranging from 750-1,200 metres, the Shiwaliks are the foot-hills just above the Bhabar and Tarai, once famous for the swamps and insalubrious climate, inhabited by Tribal people only, now reclaimed and developed into a fertile land, supporting a large population. While the northern zone is composed of gneisses and granites, this has a great complexity of structure, having the most favorable climatic condition for human habitation. The elevation varying from 1,000 metres to 3,500 metres from low lying river valleys to peaks close to the Great Himalayas, the Lesser Himalayas, with moderately steep slopes, consists of many fertile and flat river valleys.

27. The sub-projects fall within this zone, which is the most populated zone. This region is watered by the Rivers like Alaknanda, Pinder, Kosi, Gomti, Saryu, Ramganga, Kali, *etc.* The banks of these rivers locally called as 'seras' are highly fertile. The major Lesser Himalayan settlements are Almora, Bageshwar Chamoli, Champawat, Rudraprayag, Pauri, Tehri, Haldwani *etc.* are situated in this region. The cross profiles of the fluvial valleys show convex form with steep valley sides, interlocking spurs descending towards the main channel, hanging valleys, water falls and rapids and terraced agricultural fields on the gentle slopes on the valley sides. The clustering of villages is confined mainly on the gentle slopes of the ridges on the fluvial terraces.
28. The northern most zone consisting of perpetually snow-covered ranges between 3,500 to 4800 metres, although the snow-line rises to 5,400 metres, during summers at some places. The zone contains a number of glaciers, Pindari, Milam, Nandakot, Kafni, Untadhura, Gori etc. which originate to a number of snowfed rivers like Alaknanda, Bhagirathi, Pinder, Gori Ganga *etc.* The Dharamganga and Saryu are major tributaries of the Kali River, which separates Kumaon from Nepal in the extreme north-east.

2. Geology

29. According to Gansser (1964), the Himalayas may be sub-divided into five geographical divisions from west to east. In their longitudinal structure, the Himalayas are divided (from north to south) by a series of parallel tectonic zones. The 'Sub' or 'Outer-Himalayas' forming the foot-hill zone are delimited in the south by the large fans of Ganges alluvial

deposits, whereas the northern edge is a clearly outlined tectonic feature—the Main Boundary Fault—genetically linked with Miocene metamorphism in the Himalayas.

30. The Lesser Himalayas are composed of tectonically compressed blocks of Paleozoic and Mesozoic crystallines, metamorphics, and sedimentary rocks. The Main Central Thrust is a major tectonic feature of the Himalayas and has brought the crystalline rocks of the Higher Himalayas over the younger sedimentaries.
31. The Greater/Higher Himalayas consist of a single range with an average height exceeding 6,000 m. The width of this zone, mostly composed of granites and gneisses, is 24 Km. The Central Crystallines occupy the core or the 'axis' of this range, and were considered to be Tertiary intrusive accompanying the compression movements responsible for the uplift of the Himalayas by some earlier workers. The recent view, however, is that they are mostly Paleozoic or Precambrian in age and represent a geanticline between the unfossiliferous sediments of the Lesser Himalayas to the south and a highly fossiliferous sequence of the Tethys zone in the north. The stratigraphic order in the Tethys zone is well known because of the well preserved fossils such as productus, ophiceras, and the likes.

3. Physiography

32. Uttarakhand lies in the Northern part of India amidst the magnificent Himalayas and dense forests. The state is bordering Himachal Pradesh in the north-west and Uttar Pradesh in the South and has international borders with Nepal and China. Uttarakhand consists of 13 districts *viz.*, Pithoragarh, Almora, Nainital, Bageshwar, Champawat, Uttarkashi, Udham Singh Nagar, Chamoli, Dehradun, Pauri, Tehri Garhwal, Rudraprayag and Haridwar.

B. Pedology

33. The soils are natural, dynamic, heterogeneous, non-renewable resource, which support plant and animal life. Most of the soil in Uttarakhand state is organic in nature but in some areas it content high proportion of minerals.
34. The soils developed from rocks like granite, schist, gneiss, phyllites, shales, slate etc. under cool and moist climate.
35. Very steep to steep hills and Glacio-fluvial valleys are dominantly occupied with very shallow to moderately shallow excessively drained, sandy-skeletal to loamy-skeletal, neutral to slightly acidic with low available water capacity soils. They have been classified as Lithic/Typic Cryorthents. These soils are in general under sparse vegetation.
36. The baseline data on soil quality at each proposed site for construction of MPH cum rescue centre will be generated by the contractor before commencement of construction works. The details of the sites is given in ***Table IV-1***
37. During construction the sampling locations proposed are, where the construction/ restoration/repair work will be done.

Table IV-1: Locations for Generation of Baseline Data for Soil Sample

S. No.	Sub-Projects	No. of Sampling	Sampling Locations
1.	Milam	1	At project location

C. Climate and Meteorology

38. The State of Uttarakhand, with its highly varying topographical features, has shown an equally variegating climatic condition, ranging from hot and sub-humid sub-tropical in the southern tract of Bhabhar to temperate, cold alpine, and glacial climates in the northern part of the high mountains.
39. Factors such as elevation, slope, proximity of glaciers, forests, mountain peaks and ridges and direction of mountain ranges together give rise to the great variations in climatic conditions, even at the micro and local levels. These attributes determine the temperature range as well as the distribution of rainfall.
40. However, the overall climatic condition in the State is governed by the southwest monsoon. It has a sub-tropical to temperate climate, with three pronounced seasons; summer, winter, and monsoon. The hilly terrain of the Himalayan region has snow cover and is severely cold during winter with snowfall normally occurring during the months of December to March. The climatic conditions of Almora, Nainital, Pithoragarh, Chamoli, Uttarkashi, Pauri and Dehradun are humid and cold.
41. There is no meteorological observatory in the district Pithoragarh. The following account of the climate is based mainly on the records of the observations in the neighboring districts where similar meteorological conditions prevail. Variations in temperature are considerable from place to place and depend upon elevation as well as aspect. As the insolation is intense at high altitudes, in summer temperatures are considerably higher in the open than in the shade. Pools of cold stagnant air in the valleys cause the diurnal range of temperature to be considerable. January is the coldest month with a mean maximum temperature of 10°C. at heights of 2,000 m. above sea-level, the mean minimum temperature being at the freezing point (0° C.). Cold waves in the wake of western disturbances often make winter conditions rigorous. With the onset of the monsoon towards the end of June, day temperatures fall by about 3° to 5°C. and with its withdrawal towards the third or fourth week of September, day and night temperatures begin to decrease, slowly in the beginning but more rapidly after October till January, which is the coldest month. Temperatures are much lower at higher altitudes towards the north. In association with western disturbances, precipitation at higher altitudes occurs mostly in the form of snow which accumulates considerably in the valleys. After January, both day and night temperatures begin to rise, rapidly from March to May or June, the last two being the warmest months. The mean daily maximum temperature is about 25°C. at stations. 2,000 m. above sea-level, 15° to 18°C. at 3,000m. Above sea-level and still lower at higher elevations. With the incursion of the monsoon current, temperatures fall slightly by about 3° to 5°C. 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. The rainfall generally increases from the south towards the north and place. 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. 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.

D. Ambient Air Quality and Noise Level

42. The pristine environment and sparse population suggest that most part of the State have a very good air quality. Any point or non-point pollution sources of air pollution were not observed throughout the survey period. It was observed that the traffic on the roads is too low to cause unbearable air pollution due to vehicular exhaust. Finally, there are no industries recorded in or along the sub-project areas and hence any other source of atmospheric air pollution is not expected.
43. The air pollution level is well within the permissible limits because there are no major sources of pollution in the sub-project region. The baseline data on ambient air quality will be generated by the contractor before commencement of construction work. The proposed locations of air quality monitoring at pre-construction stage (baseline data) are as follows as per CPCB guidelines. The air parameters to be monitored are $PM_{2.5}$, PM_{10}, SO_2, NO_x and CO.

Table IV-2: Locations for Generation of Baseline Data for Ambient Air Quality (AAQ) and Noise Levels

Sl. No.	Sub-Project	No. of Stations	Sampling Locations	
			Station – 1	Station – 2
1.	Milam	2	Nearest Village (*i.e.* Milam)	At project location (*i.e.* Helipad site)

44. During construction the sampling will be conducted where the construction/restoration work will be done.
45. Generally, noise pollution is not a problem in the state except in the urban areas like Dehradun. Traffic, industrial, and festival/cultural noises, along with noise generated from construction activities, DG sets *etc.*, are the most prominent sources of noise in the urban areas. Overall noise level in the towns is almost calm except on some busy routes of Uttarakhand.
46. During the construction period, a temporary increase in the noise levels are expected as there will be movement of construction machineries and construction activities to be done in the proposed sites. Suitable noise barriers in the form of vegetation and timely scheduling of construction activities will help minimize these effects better.
47. It was observed that ambient noise scenario in residential, commercial, and sensitive areas in the study area are quite low in general. The baseline data on ambient air quality will be generated by collection of representative samples by the contractor before commencement of construction works. The selection of sampling location will be representative of residential, commercial, institutional, industrial and sensitive locations. The proposed locations of Equivalent Day & Night Time Noise Levels at pre-construction stage (Baseline data) will be same as that indicated in ***Table IV-2***.

E. Hydrology

48. Uttarakhand has tremendous water resources such as glaciers, lakes, rivers and other water bodies. Most of these have tourism importance like Milam, Pindari, Sunder Dhunga and Heeramani Glaciers; Seven lakes in Nainital; and some wetlands. However these water bodies are located far from the sub-project sites.
49. Generally, there has been an overall decline in water resources in the State. Hydrological studies over the last decades confirm the diminishing water resources and the worsening

crises as caused by the following factors which have resulted in the decrease in underground seepages. These have directly contributed to the reduction of water availability in and reduction of discharge in nallas as well as extensive disappearance of springs-the region's primary source of drinking water.

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

1. Water Drainage

50. The region of Uttarakhand is well drained by numerous rivers and rivulets locally known as Gad (river) and Gadhera (rivulet). The water resources of this region are of singular importance not only for the region but also for the whole Gangetic plains of north India. There are three main river systems are: (i) the Bhagirathi – Alaknanda basin – Ganges basin, (ii) The Yamuna – Tons basin, and (iii) the Kali basin.
51. The Kumaon Hills are drained by the following river systems:
    - Kali System - The River Kali flows along the eastern border of Kumaon. It drains a larger part of the region. The main tributaries of River Kali, which orginates from the various parts of the Kumaon are Dhauliganga, Goriganga, Saryu and Ladhiya.
    - Ramganga System – This river system drains the southern tract of Kumaon. It rises in the lower Himalayan Zone and flows in almost SSW direction before entering the plains through the Siwalik Hills near Dhikala.

2. Water Quality

52. There is very little documentation on the pollution status of rivers except that of the holy river Ganga and some other water bodies, where there were at least limited monitoring studies recently. In terms of quality, the surface water of the State is unprotected from untreated waste water, and runoffs from chemical fertilizers and pesticides. No proper sewage treatment facilities exist in the sub-project sites. The increasing pollution of water bodies constitutes the biggest threat to general public health and biodiversity of the state. At present, there is limited information available on the quality of fresh water resources of Uttarakhand State.

    Based on limited records, the water quality of Uttarakhand's rivers, rivulets, and other natural water bodies is generally good and no major source of water pollution was found. The hand pumps, natural water seepage in hilly areas 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. The main parameters will be monitored are TDS, TSS, pH, Hardness, BOD and Faecal Coli Form, etc.

Table IV-3: Locations for Generation of Baseline Data for Water Quality

S. No.	Sub-Project	No. of Sampling	Sampling Locations
1.	Milam	1	Nearest Water Body (River Gori Ganga)
TOTAL		1	Surface Water – 1 no.

F. Mineral Resources

53. Uttarakhand is not very rich in the field of mineral resources. Moreover, it is also part ecologically sensitive area, extensive quarrying is not practiced in the state. However, there are some minerals sparsely distributed in the state, which includes limestone, magnesite, gypsum, iron ore, graphite and copper.
54. It has been estimated that there are deposits of 100 million tonnes of limestone, 35 million tonnes of dolomite, 21 million tonnes of magnesite, 9.0 million tonnes of rock phosphate, 4.0 million tonnes of gypsum, and 8.8 million tonnes of soap stone in different areas of the State. Some of the major mineral deposits are indicated in the ***Table IV-4***

Table IV-4: Availability of important minerals (million tonnes)

S. No.	Name of Mineral	Quantity (million tonnes)
1.	Lime stone	430.5
2.	Marble	6.4
3.	Rock Phosphate	25.0
4.	Barytes	0.085
5.	Graphite	10.7
6.	Dolomite (superior)	30
7.	Magnesite	70.294
8.	Copper	1.6
9.	Soap stone	26.64
10.	Gypsum	0.195

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

55. The common minerals, which are found in the State are the following:

I. **Asbestos:** This is of the amosite variety and can be used for the production of asbestos, cement bricks, laboratory asbestos sheet and paper, but it is considered as low economic importance.
II. **Magnestic:** This is of an average quality is crystalline in nature, and is found associated with crystalline dolomites and sometimes with soapstone. The Magnesium carbonate found here is also of average quality and its mineralisation has also been reported some districts of Uttarakhand.
III. **Soap stone or Steatite:** This is white saponaceous stone resembling pipe clay is obtained in as lenticular body and is associated with mineral pyrites, which adds a color to it, and in places with magnesite. it can be mined for use as filler in soap and in the cosmetic industries. In the past various utensils were made of it which, when polished, had the appearance of marble.
IV. **Copper:** The copper mines in uttarakhand are extensive and of reputed during the period of Hindus and The Gorkhas rules. All the rich mines have since being exhausted and at present they do not offer a fair field for the employment of capital.

V. **Iron:** Small and sporadic occurrence of iron are known to occur in several parts of district but are of hardly any economic importance. Iron ore, rich in haematite, and magnetic ore, with haematite and siderite, also occur in Uttarakhand.

VI. **Graphite:** In past, this mineral also known as plumbago, found mostly in patti Lohba, was used as a dye but no large deposits have been noticed for a long time.

VII. **Gypsum**: This mineral is found on the bank of some rivers and was used in the past for the manufacture of saucers and bowls. When ground to a fine powder it is known as "Plaster of Paris" and can be used for a number of purposes.

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

IX. **Slate:** This is dense, fine grained metamorphic rock, which is produced from fine clay, can be split into thin, smooth plates and is quarried throughout Uttarakahdn except some plains Districts. It is suitable for roofing purposes, the thin dark blue slates being somewhat inferior in quality.

X. **Building Stone:** Stone which can be used for building purposes is available in most parts of Uttarakahd State. Sand stone is found in abundance in the lower hills. Gneiss and chlorite schists which are frequently used for building purposes.

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

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

56. Besibes the above minerals, some other minerals found in small quantities such as antimony, arsenic, lignite or brown marble, mica and silver.

G. Seismology

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

58. Seismically, the State constitutes one of the most active domains of the Himalayan region. Several damaging earthquakes are recorded from this region. As such, the region is classified under high seismic zones IV and V. All the proposed 5 helipads sites are located in the Seismic Zone V. The modified mercalli intensity broadly associated with the zone V is IX. The seismic zones of India are represented In ***Figure – 3*** given below.

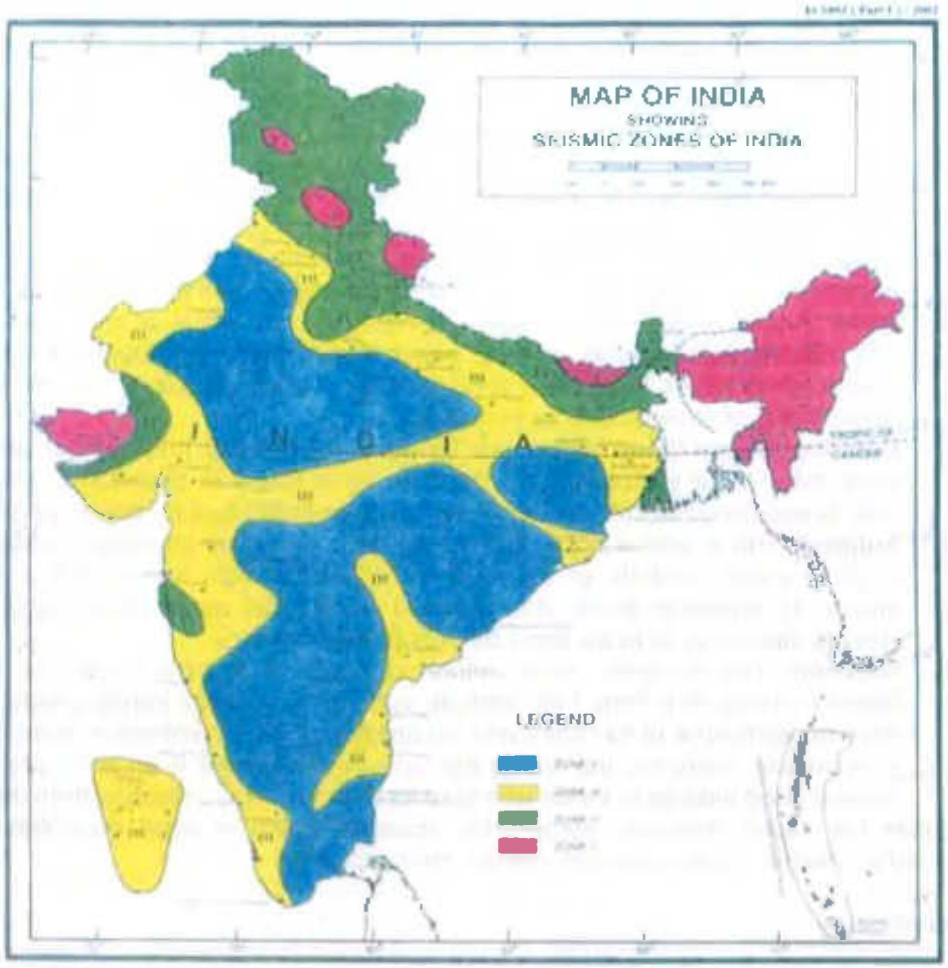
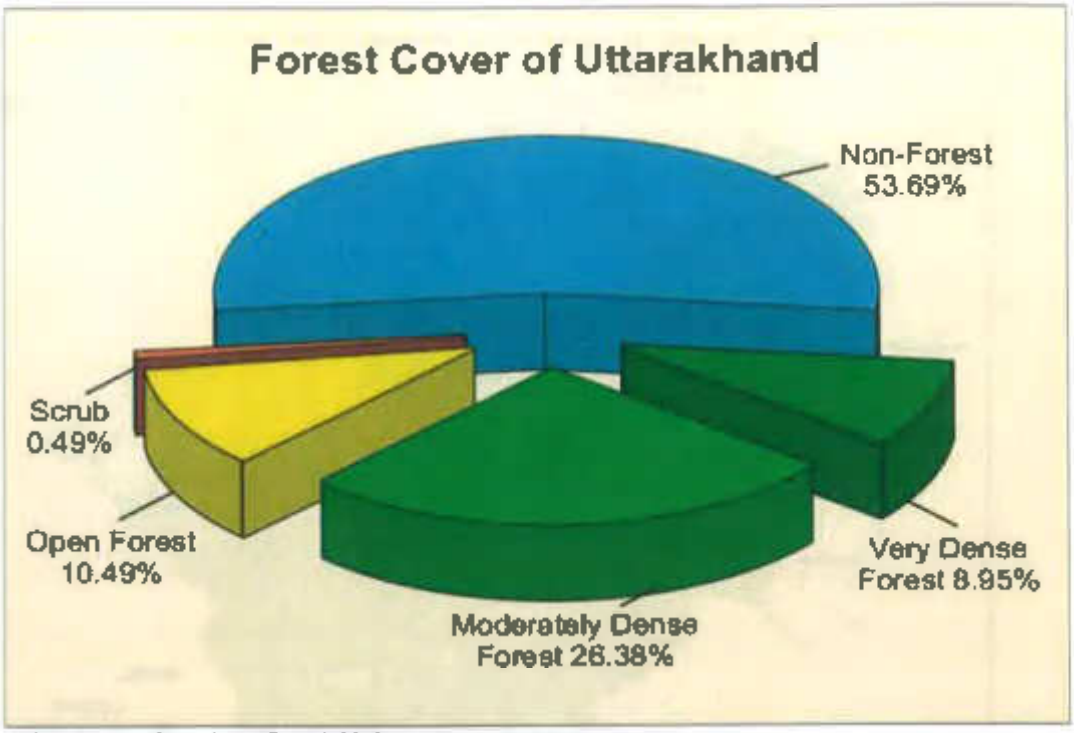


Figure – 3: Seismic Zones of India

H. Ecology

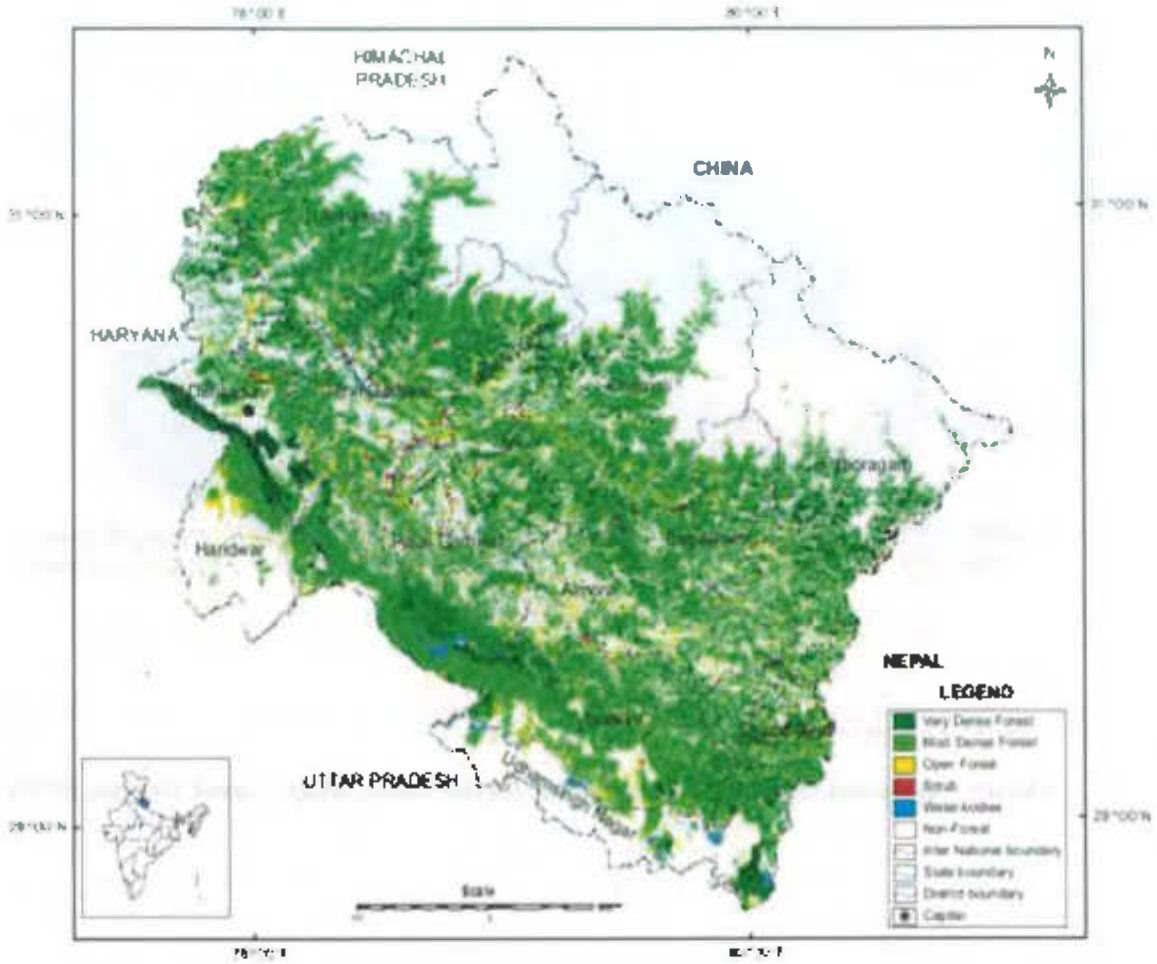
1. Forests

59. According to the India State Forest Report 2013, the recorded forest area of the Uttarakhand state is 24,508 Km^2, which constitutes 45.82% of its total geographical area. The Very Dense Forests constitute of 4,785 km^2, Modedate dense forest of 14,111 km^2 and Open Forest of 5,612 km^2.
60. 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. The forest covers of Uttarakhand state are shown in ***Figures – 4 & 5*** and the district-wise forest cover are given in ***Table IV-5***.



Source: India State Forest Report, 2013

Figure - 4: Forest Cover of Uttarakhand (As per India: State Forest Report, 2013)



Source: India State Forest Report, 2013

Figure-5: Forest Cover Map of Uttarakhand

Table IV-5: District-wise Forest Cover, Uttarakhand

Divisions	Districts	Geographical Area (Km^2)	Forest Cover (Km^2)			Total Forest	% of GA
			Very Dense	Moderate Dense	Open Forest		
Garhwal	Chamoli	8,030	441	1,573	686	2700	39.23
	Dehradun	3,088	583	695	332	1,610	52.17
	Pauri Garhwal	5,329	520	2,095	676	3,291	61.76
	Rudrapreyag	1,984	241	592	297	1,130	56.96
	Tehri Garhwal	3,642	298	1,232	618	2,148	58.96
	Uttarkashi	8,016	570	1,957	618	3,145	39.23
	Haridwar	2,360	25	333	257	615	26.06

Divisions	Districts	Geographical Area (Km^2)	Forest Cover (Km^2)			Total Forest	% of GA
			Very Dense	Moderate Dense	Open Forest		
Sub-total	***7 Districts***	***32,449***	***2,678***	***8,477***	***3,484***	***14,639***	***45.11***
Kumaon	Pithoragarh	7,090	571	1,113	416	2,100	29.62
	Bageshwar	2,246	197	883	305	1,385	61.67
	Almora	3,139	222	927	428	1,577	52.04
	Nainital	4,251	805	1,899	570	3,074	72.31
	Champawat	1,766	337	576	274	1,187	67.21
	Udham Singh Nagar	2,542	175	236	135	546	21.48
Sub-total	***6 Districts***	***21,034***	***2,107***	***5,634***	***2,128***	***9,869***	***50.38***
Total	**13 Districts**	**5,3483**	**4,786**	**14,111**	**5,612**	**24,508**	**45.82**

Source: India State Forest Report, 2013

Note: (i) Very Dense Forest: *All lands having tree canopy cover > 70%.*

(ii) Moderate Dense Forest: *Tree canopy cover between 40%-70%.*

(iii) Open Forest: *Tree canopy cover between 10%-40% and*

(iv) Degraded Forest: *Tree canopy cover <10%.*

61. Forest type mapping using satellite data has been undertaken by the "Forest Survey of India" with reference to the classification given by Champion and Seth (1968). As per this assessment, the state has 34 forest types, which belong to eigth forest type groups, *viz.*
    - Tropical Moist Deciduous,
    - Tropical Dry Deciduous,
    - Sub-tropical Pine,
    - Himalayan Moist Temperate Forests,
    - Himalayan Dry Temperate Forests,
    - Sub-Alpine Forests,
    - Moist Alpine Scrub and
    - Dry Alpine Scrubs.

62. A wide variety of trees are found in Uttarakhand State. Some prominent tree species enumerated in this section based on their altitudinal gradients above mena sea level. 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*), Sal (*Shorea robusta*), Seesam (*Dalbergia sissoo*) etc. for their ecological and economic importance, which are 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 good compactness with twisted fibers. The State Govt. of Uttarakhand has declared the oak tree (*Quercus leuchotrichophora*) 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. The Chir-Pine (*Pinus roxburghii*) is an excellent source of resin in Uttarakhand, which is used in production of terpentine oil. The Deodar (*Cedrus deodara*) grows in the

temperate to alpine area that is found between 1800 to 2400 m (amsl). Its oil has an impotant medicial property generally used in skin diseases and disorders. The predominant top-canopy (tree) species of the State forests have been described in ***Table IV-6*** given below.

Table IV- 6: Predominant top-canopy (tree) species according to altitude (m. amsl)

Sl. No.	Name of Some Common Tee Species of Uttarakhand			Altitude (m. amsl)
	Vernacular	English Name	Botanical Name	
1.	Cheed	Chir-Pine	*Pinus roxburghii*	800-1800
2.	Kail	Blue-Pine	*Pinus wallichiana*	1800-2400
3.	Banj	Himalayan Oak Tree	*Quercus incana*	1700-2000
4.	Deodar	Himalayn Cedar Tree	*Cedrus deodara*	1800-2400
5.	Raga	Himalayan Low Level Fir	*Abies pindrow*	2100-2900
6.	Raga	Himalayan High Level Fir	*Abies spectabilis*	2900-3600
7.	Thuner	Himalayan Yew	*Texus baccata*	2400-2700
8.	Bhojpatra	Himalayan Birch	*Betula utilis*	3000-3500
9.	Kathbhoj	Himalayan Birch	*Betula alnoides*	2800-3200
10.	Moru	Oak Tree	*Quercus dilatata*	2000-2500
11.	Kharsu	Oak Tree	*Quercus semicarpifolia*	2200-2400
12.	Spruce	Spruce	*Picea smithiana*	2400-2900
13.	Surai	Cypress	*Cupressus torulosa*	2300-2400
14.	Pangar	Horse Chestnut	*Aesculus indica*	1800-2100
15.	Buransh	Rose Wood	*Rhododendron arboreum*	1600-2000
17.	Simaru	Rose Wood	*Rhododendron campanulatum*	2200-3000
18.	Kachnar	Orchid Tree	*Bauhinia variegata*	600-900
19.	Shal	Shal Tree	*Shorea robusta*	600-750
20.	Sagwan	Teak	*Tectona grandis*	600-750

2. Agriculture

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

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

Table IV-7. Area under Principal Crops and Productivity in Uttarakhand

Sl. No.	Items	Year/ Period	Unit	Statistics
A. Area Under Principal Crops (Provisional)				
1.	Cereals	2011-12	Ha	896774
	(i) Rice (*Oryza sativa*)	2011-12	Ha	280108
	(ii) Wheat (*Triticum aestivum*)	2011-12	Ha	369209
	(iii) Barley (*Hordeum vulgare*)	2011-12	Ha	22508
	(iv) Maize (*Zea mays*)	2011-12	Ha	28038
	(v) Finger millet (*Eleusine coracana*)	2011-12	Ha	125163
	(vi) Sanwan	2011-12	Ha	63002
	(vii) Other	2011-12	Ha	8746
2.	Pulses	2011-12	Ha	55690
	(i) Urad (*Phaseolus radiatus*)	2011-12	Ha	12980
	(ii) Lentil (*Lens esculenta*)	2011-12	Ha	12295
	(iii) Pea (*Pisum sativum*)	2011-12	Ha	3451
	(iv) Gahat (*Mycrotoma biflorum*)	2011-12	Ha	12033
	(v) Rajma (*Dolichos lablab*)	2011-12	Ha	4614
	(vi) Gram (*Cicer arietinum*)		Ha	766
	(vii) Bhatt (*Glycine* Sp.)	2011-12	Ha	5734
	(viii) Others	2011-12	Ha	3817
3.	Oil Seeds	2011-12	Ha	29705
	(i) Mustard (*Brassica compestris*)	2011-12	Ha	14294
	(ii) Seasmum (*Sesamun indicum*)	2011-12	Ha	2020
	(iii) Groundnut (*Arechis hypogea*)	2011-12	Ha	1112
	(iv) Soyabean (*Glycin max*)	2011-12	Ha	12279
4.	Other Crops	2011-12		
	(i) Sugarcane (*Saccharum officinarum*)	2011-12	Ha	108255
	(ii) Onion (*Allium cepa*)	2011-12	Ha	2353
B. Agriculture Productivity (Provisional)				
1.	Cereals	2011-12	Qtl./Ha	22.03
	(i) Rice (*Oryza sativa*)	2011-12	Qtl./Ha	21.20
	(ii) Wheat (*Triticum aestivum*)	2011-12	Qtl./Ha	23.80
	(iii) Barley (*Hordeum vulgare*)	2011-12	Qtl./Ha	12.64
	(iv) Maize (*Zea mays*)	2011-12	Qtl./Ha	14.66
	(v) Finger millet (*Eleusine coracana*)	2011-12	Qtl./Ha	13.92
2.	Pulses	2011-12	Qtl./Ha	8.15
	(i) Urad (*Phaseolus radiatus*)	2011-12	Qtl./Ha	8.13
	(ii) Lentil (*Lens esculenta*)	2011-12	Qtl./Ha	8.19
	(iii) Pea (*Pisum sativum*)	2011-12	Qtl./Ha	9.54
	(iv) Gahat (*Mycrotoma biflorum*)	2011-12	Qtl./Ha	8.04
	(v) Rajma (*Dolichos lablab*)	2011-12	Qtl./Ha	10.27
	(vi) Gram (*Cicer arietinum*)		Qtl./Ha	7.85
	(vii) Bhatt (Black Soyabeen)	2011-12	Qtl./Ha	9.83
3.	Oil Seeds	2011-12	Qtl./Ha	8.34
	(i) Mustard (*Brassica compestris*)	2011-12	Qtl./Ha	8.00
	(ii) Seasmum (*Sesamun indicum*)	2011-12	Qtl./Ha	2.26
	(iii) Groundnut (*Arechis hypogea*)	2011-12	Qtl./Ha	12.72
	(iv) Soyabean (*Glycin max*)	2011-12	Qtl./Ha	14.46
4.	Other Crops	2011-12	Qtl./Ha	
	(i) Sugarcane (*Saccharum officinarum*)	2011-12	Qtl./Ha	609.33
	(ii) Onion (*Allium cepa*)	2011-12	Qtl./Ha	55.69

Source: *Uttarakhand at a Glance (2012-13), Directorate of Economics & Statistics, GoU.*

Table IV-8: Ecological Sub-Regions and Altitude-wise Major Agriculture Crops

Sl. No.	Ecological Sub-Region	Altitudinal Gradient (m)	Major Agriculture Crops
1.	Lower Dun, Terai	300-600	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*) and Sugarcane (*Sachharum officinarum*).
2.	Upper Dun, Bhabar, lower Shivaliks	600-1,200	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*), Maize (*Zea mays*) Chaulai (*Amaranthus* species) Finger millet (*Eleusine coracana*) Barnyard millet (*Echinochloa frumentesia*)
3.	Middle Garhwal-Kumaon Region	1,200-1,800	Wheat (*Triticum aestivum*), Paddy (*Oryza sativa*), Cheena (*Panicum miliaceum*), Potato (*Solanum tuberosum*), Barley (*Hordeum vulgare*) Finger millet (*Eleusine coracana*) and Barnyard millet (*Echinochloa frumentesia*).
4.	Upper Garhwal-Kumaon Region	1,800-2,400	Wheat (*Triticum aestivum*) Barley (*Hordeum vulgare*) Potato (*Solanum tuberosum*), Chaulai (*Amaranthus* species), Cheena (*Panicum miliaceum*) and Phaphra (*Fagopyum tatericum*)
5.	Cold Zone	2,400-3,600	**Summer Crops:** Wheat (*Triticum aestivum*), Barley (*Hordeum vulgare*) Potato (*Solanum tuberosum*), Phaphra (*Fagopyum tatericum*) Chaulai (*Amaranthus* species), Kauni (*Setaria etalica*) Ogal (*Fagopyrum esculentum*) and Uva Jau (*Hoycleum himalayanse*)

Source: *Uttarakhand at a Glance (2012-13), Directorate of Economics & Statistics, GoU.*

65. The irrigation facility is only available adjoining to rivers in valleys. The cross drainages are very limited within the state. The irrigation and drainage system in Uttarakhand is described in **Table IV-9** given below.

Table IV-9: Mode of Irrigation and Drainage System in Uttarakhand

Sl. No.	Items	Year/Period	Unit	Statistics
A.	**Net and Gross Irrigated Area**			
1.	Canals	2011-12	Ha	83687
2.	Tube Wells	2011-12	Ha	216100
3.	Other Wells	2011-12	Ha	11519
4.	Tanks/ Ponds	2011-12	Ha	83
5.	Other Sources	2011-12	Ha	24747
6.	Net Irrigated Area (NIA)	2011-12	Ha	338136
7.	Gross Irrigated Area (GIA)	2011-12	Ha	561733
B.	**Irrigational Infrastructure**			
1.	Length of Canals	2011-12	Km.	11588
2.	Length of Lift Canals	2011-12	Km.	242

Sl. No.	Items	Year/Period	Unit	Statistics
3.	Tube Wells (State)	2011-12	No.	1110
4.	Pump Sets (Boring/ Free Boaring)	2011-12	No.	54642
5.	Hauj	2011-12	No.	32850
6.	Gool	2011-12	Km.	26365
7.	Hydrum	2011-12	No.	1547
8.	C.C.A. Under State Canal	2011-12	Lakh (Ha)	3.302
9.	Revenue Collection by Irrigation	2011-12	Rs. (Lakh)	252.27

Source: Uttarakhand at a Glance (2012-13), Directorate of Economics & Statistics, GoU.

3. Fishery

66. The State has great potential for the development of fisheries. The State abounds in perennial and seasonal water bodies which hold high promise for the growth of fishery. Golden Mahseer (*Tor putitora*), one of the main game and food fish in the central Himalayan region, has decreased significantly. The fish migrate considerable distances upstream in search of suitable spawning grounds. Stocks of the Himalayan mahseer are depleted and it is now considered an endangered species. Catch data from the major rivers are not available while studies are characterized as sporadic and preliminary in nature. According to available statistics, the Himalayan Mahseer contributes significantly only in one river-comprising 32.8% of the catch from the Nayar River, 9.7% from Song River, and 0.8-3.1% from other rivers. The Important fishes commonly found in the Himalayan river basins are *Catla catla*, *Labeo rohita*, *Labeo calbase*, *Cirrhinus mirigale*, *Rita rita*, *Heteropneuptus fonilis*, *Notopterus nontopterus*, *Macrobrachum rosenbergii*, *Channa punetatus etc.*
67. No interference with fishery activities is envisaged by execution of the proposed subprojects.

4. Biodiversity and Protected Areas

68. The State of Uttarakhand is endowed with rich bio-diversity as manifested by its approximately 46 percent forest cover. The State has established six national parks and seven wildlife sanctuaries for the conservation of flora and fauna. Such areas include the Nanda Devi National Park, Valley of Flowers, Gangotri National Park, Govind Pashu Vihar National Park, Rajaji National Park, Jim Corbett National Park, Kedarnath Wildlife Sanctuary, Askot Musk Deer Sanctuary, Mussoorie Sanctuary, Binsar Wildlife Sanctuary, Sonadi Sanctuary, Nandhaur Wildlife Sanctuary and Govind Wildlife Sanctuary—all of which are being looked after by the Uttarakhand government. A positive remark on the State is that it maintains rich wildlife outside their protected areas.

Table IV-10: Wildlife in Uttarakhand

Sl. No.	Protected Areas	Year	Unit	Statistics
1.	**Biosphere Reserves**			
	(i) Number	2013-14	No.	1
	(ii) Area	2013-14	km^2	5,860.69
2.	**National Parks**			
	(i) Number	2013-14	No.	6
	(ii) Area	2013-14	km^2	4,915.02
3.	**Wildlife Sanctuaries**			
	(i) Number	2013-14	No.	7
	(ii) Area	2013-14	km^2	2,690.12

Sl. No.	Protected Areas	Year	Unit	Statistics
4.	**Important Wild Animals**			
	(i) Tiger	2008	No.	178
	(ii) Leopard	2008	No.	2335
	(iii) Elephant	2008	No.	1346
	(iv) Musk Deer	2008	No.	376
	(v) Black Bear	2008	No.	1935
	vi) Sloth Bear	2008	No.	172
	vii) Brown Bear	2008	No.	14

Source: Wildlife and Protected Areas, ENVIS, 2014

69. The Himalayas represent one of the most fascinating biota (fauna and flora) all over the world, both in terms of quality and quantity. This is evident from the fact that more than 50 percent of all biota can be found only in the Himalayan region. Such fact is brought about by the region's uniqueness in terms of favorable climatic conditions, natural habitats, and soil types.

70. The State of Uttarakhand is represented by Biogeographic Zones 2B Western Himalaya and 7B Siwaliks[1] in this region. About 18.7% of the total area under the Forest Department has been clearly earmarked for biodiversity conservation by the creation and management of 12 Protected Areas (PA) and a biosphere reserve in the State.

Table IV-11: Protected Areas in Uttarakhand

S. No.	Protected Area	District	Establishment	Area (m^2)
National Park				
1	Corbett	Nainital & Pauri Garhwal	1936	520.82
2	Nanda Devi	Chamoli	1982	624.60
3	Valley of Flowers	Chamoli	1982	87.50
4	Rajaji NP	Dehradun, Pauri & Haridwar	1983	820.00
5	Gangotri	Uttarkashi	1989	2390.02
6	Govind	Uttarkashi	1990	472.08
Wildlife Sanctuary				
1	Govind WLS	Uttarkashi	1955	485.89
2	Kedarnath WLS	Chamoli	1972	975.20
3	Askot WLS	Pithoragarh	1986	600.00
4	Sonanadi WLS	Garhwal	1987	301.18
5	Binsar WLS	Almora	1988	47.07
6	Musoorie WLS	Dehradun	1993	10.82
7	Nandhaur WLS	Nainital and Champawat	2012	269.96

Source: Wildlife and Protected Areas, ENVIS, 2014

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

[1] Negi, A.S., Status, Distribution and Management of Mountain Ungulates in Uttaranchal. Envis Bulletin, 2002

on the presence of Leopards, Deers, Foxes, and Wild Pigs. Some important information about wildlife of Uttarakhand is given in the Table below.

Table IV-12: List of Major Flora

Sl. No.	Local Name	Scientific Name
A. Trees		
1.	Buransh	*Rhododendron arboreum*
2.	Deodar	*Cedrus deodara*
3.	Chir	*Pinus roxburghii*
4.	Surai	*Cupressus torulosa*
5.	Padam	*Prunus cornuta*
6.	Mehal	*Pyrus pashia*
7.	Otis	*Alnus nepalensis*
8.	Ayar	*Lyonia ovalifolia*
9.	Kafal	*Myrica sapida*
10.	Akhrot	*Juglans regia*
11.	Bhimal	*Grewia optiva*
12.	Ritha	*Sapindus mukorossi*
13.	Tun	*Toona ciliata*
14.	Nimla	*Ficus auriculata*
15.	Timur	*Zanthoxylum tamala*
16.	Kharik	*Celtis australis*
17.	Chamkhirik	*Carpinus viminea*
18.	Katmon	*Betula alnoides*
19.	Kajal	*Acer acuminatum*
20.	Katoj	*Castanopsis tribuloides*
21.	Kimola	*Acer oblongum*
22.	Kandru	*Ilese dipyrene*
23.	Banj	*Quercus semicarpifolia*
B. Shrubs		
1.	Kala Hisalu	*Rubus lasiocarpus*
2.	Karoz	*Carissa spinarium*
3.	Kobra Plant	*Arisama helleborifollium*
4.	Kandali	*Urtica parviflora*
5.	Satevar	*Asparagus racemosus*
6.	Dudhi	*Hollenrhena antidysentricr*
7.	Bajradanti	*Potentilla fulgens*
8.	Banfasa	*Viola surpans*
9.	Bach	*Acorus calamus*
10.	Nakol	*Urticor dioica*
11.	Patyura	*Pteraecanthus angustifrons*
12.	Dudhia	*Taraxacum officinale*
13.	Vatula	*Flemingia fruticulose*
14.	Belmur	*Flacourtia indica*
15.	Nirghesi	*Delphinium denudatum*
16.	Silfoda	*Bergenia gossypina*
17.	Jula	*Gerbera grassypina*
C. Grasses and Herbs		
1.	Dub	*Cynodon dactylon*
2.	Kush	*Sacharum spontaneum*
3.	Gol ringal	*Chimonobambusa falcata*
4.	Jatamasi	*Nardostachys grandiflora*
5	Tachita	*Apluda mutlcr*

Sl. No.	Local Name	Scientific Name
6.	Dev ringal	*Thamnocalamus faclouei*
7.	Jhugra ringal	*Arundinaria jaunsarensis*
8.	Thamgll	*Thamnocalamus spathiflorus*

Table IV-13: List of Major Fauna

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

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

5. Biosphere Reserves

72. The Biosphere Reserve is the top category after Wildlife Sanctuary and National Park in the Country. Out of the 14 Biosphere Reserves situated in India, the Nanda Devi Biosphere Reserve (NDBR)—established second among the 14—is situated in the State of Uttarakhand. It extends in the three districts of Chamoli (Garhwal), Pithoragarh, and

Bageshwar (Kumaon). The Nanda Devi National Park (NDNP) and the Valley of Flowers are UNESCO World Heritage Site declared in 1988. The NDNP is located in the transition range between the Zanskar range and Himalayan foothills with 97 species of plants including many rare and almost extinct plants like *Saussurea sudhanshui, Nardostachys grandiflora, Picrorhiza kurroa, Cypripedium elegans, C. himalaicum, Dioscorea deltoidea and Allium stracheyi.* There are also 83 animal species including the Bharal (*Pseudois nayaur*), Himalayan Musk Deer (*Moschus chrysogaster*), Mainland Serow (*Capricornis sumatraensis*), Himalayan Tahr (*Hemitragus jemlahicus*), Goral (*Nemorhaedus goral*), Snow Leopard (*Panthera uncia*), Common Leopard (*Panthera pardus*), Himalayan Black Bear (*Selenarctos thibetanus*), Common Langur (*Presbytis entellus*), and Rhesus Macaque (*Macaca mullata*). Also, there are about 114 avian species and 27 species of butterflies in the NDNP.

73. The Rajaji National Park was established in 1983 protecting sections of the tropical deciduous forest area of the Shivalik Hill range on the Himalayan foothills. The Park covers 820.42 square kms, along the Haridwar, Dehradun and Pauri Garhwal. The park has a vast Sal forest, and mixed forest mostly covered with Acacia catechu and Vetiveria zizanioides. It is refuge to approximately 49 species of mammals, 315 species of birds, 49 species of reptiles, 10 species of amphibians and 49 of Piscean species. This park has the largest population of elephants in Uttarakhand and a large population of tigers and leopards. Noteable animals seen in the par are the Wild Cat *(Felis silvestris)*, Goral *(Nemorhaedus goral)*, Rhesus Macaque *Maccaca mulatta)*, Himalayan Yellow Throated Marten *(Martes flavigula)*, Monitor Lizard *(Varanus)*, Indian Hare *(Lepus nigricollis)*, Sloth *(Folivora)*, Himalayan Black Bear *(Ursus thibetanus)*, King Cobra (*Ophiophagus Hannah)*, Jackal *(Canis)*, Barking Deer *(Muntiacus muntjak)*, Sambar *(Rusa unicolor)*, Wild boar *(Sus scrofa)*, Indian Langur *(Semnopithecus entellus)*, Indian Porcupine *(Hystrix indica)* and Pythons *(Pythonidae)*. The population of birds consists of the Great Pied Hornbill *(Buceros bicornis)*, Himalayan Pied Kingfisher *(Ceryle rudis)*, Sparrows *(Passeridae)*, Fire Tailed Sunbird *(Aethopyga ignicauda)* and the Peacock *(Pavo cristatus)* - Indian National Bird.
74. The Jim Corbett National Park covers 520 sq kms of Savannah-type grasslands and Sal forests. Declared as a Tiger Reserve in 1973, the Park has a rich diversity including the White Tiger *(Panthera tigris tigris)*, Throated Martem *(Martes flavigula)*, Himalayan Palm Civet *(Paradoxurus hermaphroditus)*, Indian Grey Mongoose *(Herpestes edwardsii)*, Para, Kakka, Ghoral *(Nemorhaedus goral)*, Bar-headed Goose *(Anser indicus)*, Duck, Grepe, Snipe *(Gallinago gallinago)*, Turtles, Python *(Pythonidae)*, Common Otter *(Lutrinae)*, Porcupine *(Hystrix Indica)*, Clack-taped Hare, Chital *(Axis axis)*, Spotted Deer *(Axis axis)*, Viper, Cobra, Krait, King Cobra (*Ophiophagus Hannah)*, Tortoise *(Testudinidae)*, Graylag goose *(Anser anser)*, Sandpiper *(Scolopacidae)*, Gull *(Laridae)*, Cormorants *(Phalacrocoracidae Sp)* and Egrets (*Ardea alba)*.
75. The Govind National Park covers an area of 957 sq. kms in Uttarakashi and a sanctuary for the endangered Snow Leopard and some other 15 species of mammals and 150 species of birds that includes the Himalayan Black bear *(Ursus thibetanus)*, Brown bear *(Ursus arctos)*, Musk deer *(Moschus)*, Bharal *Pseudois nayaur)*, Himalayan Tahr *(Hemitragus jemlahicus)*, Serow *(Capricornis)* and Common leopard *(Panthera pardus)*. The endangered birds found in this region are Monal Pheasant *(Lophophorus impejanus)*, Koklas Pheasant, Bearded Vulture Himalayan Snow Cock (*Gypaetus barbatus)*, Golden Eagle *(Aquila chrysaetos)*, Western Tragopan *(Tragopan melanocephalus)*, Steppe Eagle *(Aquila nipalensis)* and Black Eagle *(Ictinaetus malaiensis)*. Other varieties of birds include Owls, Pigeons, Minivets, Thrush, Warblers, Bulbul, Cuckoo and Finches.

76. The Valley of Flowers is a World Heritage Site located in Chamoli. There are hundreds of species mostly being Orchids, Poppies, Primula, Calendulas, Iris, Lily, Roses, Violets, Rhododendron, Angelica, Himalayan Fritillary, Daisies and Anemones and also supports a variety of mammals like the Himalayan Tahr, Snow Leopard, Musk Deer, Red Fox, Common Langur (a type of monkey), Bharal, Serow, Himalayan Black Bear, Himalayan Brown Bear, Pica (Mouse hare). A huge variety of butterflies and birds are also found in the valley including Himalayan Golden Eagle, Griffon Vulture, Snow Partridge, Himalayan Snow Cock, Himalayan Monal, Snow Pigeon, and Sparrow Hawk. All the protected sites listed above are far away from the 5 sub-project locations.

I. Socio-Economic Profile

1. Social and Cultural Development

77. The State of Uttarakhand occupies a total land area of 53,483 Km^2, which is about 1.73% of the total geographical area of the country. The native people of Uttarakhand are generally called either Garhwali or Kumaoni depending on their place of origin in either the Kumaon or Garhwal region.
78. According to the 2011 census of India, Uttarakhand has a population of 10,086,292 people comprising 5,137,773 males and 4,948,519 females. The state is the 20th most populous state of the country having 0.84% of the population on 1.69% of the land. The population density of the state is 189 people/Km^2 having a 2001-2011 decadal growth rate of 18.81%. The gender ratio is 963 females/1000 males. The crude birth rate in the state is 18.6 with the total fertility rate being 2.3. The state has an infant mortality rate of 43, a maternal mortality rate of 188 and a crude death rate of 6.6.
79. Administratively, the State is divided into Garhwal and Kumaon Divisions and 13 Districts, 49 Tehsils and 95 Blocks. The Kumaon and Garhwal Divisions have six and seven Districts respectively. There are 16,177 villages in the State and 7,227 gram panchayats. Of the total number of villages, 5,868 villages are not connected by roads.

2. Land Use Pattern

80. The land use pattern of Uttarakhand is strongly governed by the following geo-climatic factors: altitudinal gradients, climate, mountainous terrain, lithological type, topography, surface hydrology, exposure of sun light in the crop fields, forests and alpine meadows, sparse vegetation (scrub), human settlement areas, grazing and barren land *etc.*
81. Forest is the main land use sector in the State and nearly 45.82% of the geographical area is under forest cover. The timber line vegetation is clearly demarcated above 2900 m (amsl) altitude. Agriculture is confined to areas of low reliefs, which are underlined by weak rock formation (*i.e.* schists, phyllites, weathered gneisses, and crushed quartzite). The cultivated land, approximately 12.44% of the total geographical area, is either terraced/semi-terraced or plain. Other land use categories such as meadows, grazing lands, and scrubs do not exhibit definite relationship with lithology. It is also observed that the south-facing hill slopes are covered by lush green forests. The land use pattern of Uttarakhand is given in ***Table IV-14***

Table IV-14: Land Utilisation in Uttarakhand

S. No.	Land-use	Period	Unit	Statistics
1	Total Reported Area	2012-13	Hectare	5672636
2	Forest Area	2012-13	Hectare	3484803
3	Culturable Waste Land	2012-13	Hectare	314664

S. No.	Land-use	Period	Unit	Statistics
4	Fallow Land	2012-13	Hectare	136288
	(i) Current Fallow	2012-13	Hectare	50655
	(ii) Fallow Land other than Current Fallow	2012-13	Hectare	85633
5	Barren & Unculturable Land	2012-13	Hectare	227705
6	Land under Non-agricultural Uses	2012-13	Hectare	221135
7	Permanent Pasture & Other Grazing Land	2012-13	Hectare	192149
8	Land under Misc., Tree Crops and Groves not included in Net Area Sown	2012-13	Hectare	389802
9	Net Area Sown	2012-13	Hectare	706090

Source: *Uttarakhand at a Glance (2014-15), Govt. of Directorate of Economics and Statistics*

J. Health

82. The Infant Mortality Rate is 36 and Maternal Mortality Ratio is 359 (SRS 2007 - 2009) which are higher than the National average. The Sex Ratio in the State is 963 (as compared to 940 for the country). The comparative figures of major health and demographic indicators are shown in ***Table IV-15.***

Table IV-15: Demographic, Socio-economic and Health Profile of Uttarakhand as compared to India Figures

S. No.	Indicator	Uttarakhand	India
1.	Total Population (in Crore: Census 2011)	1.01	121.01
2.	Decadal Growth (in %: Census 2011)	19.17	17.64
3.	Crude Birth Rate (SRS 2011)	18.9	21.8
4.	Crude Death Rate (SRS 2011)	6.2	7.1
5.	Natural Growth Rate (SRS 2011)	12.8	14.7
6.	Infant Mortality Rate (SRS 2011)	36	44
7.	Maternal Mortality Rate (SRS 2007-09)	359	212
8.	Total Fertility Rate (SRS 2011)	NA	2.4
9.	Sex Ratio (Census 2011)	963	940
10.	Child Sex Ratio (Census 2011)	886	914
11.	Schedule Caste Population (in Crore: Census 2001)	0.15	16.67
12.	Schedule Tribe population (in crore: Census 2001)	0.02	8.43
13.	Total Literacy Rate (in %: Census 2011)	79.63	74.04
14.	Male Literacy Rate (in %: Census 2011)	88.33	82.14
15.	Female Literacy Rate (in %: Census 2011)	70.70	65.46

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

83. The health infrastructure of the State is described in succeeding Table. There are only 14 Obstetricians/Gynaecologists and 20 Pediatricians in the State. Such numbers are way below the estimated State requirement of 59 each. Some of the essential requirements of the new State include basic primary health care, pre and post-natal care, and nutritional status and preventive care. Accessibility to health services with the aid of improved road conditions is essential to put progress in the health indicators of the State. These health infrastructures have been described in ***Table IV-16.***

Table IV-16: Health Infrastructure of Uttarakhand

Indicators	Required	In Position	Shortfall
Sub-centre	2341	1848	493
Primary Health Centre	351	257	94

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

Source: *RHS Bulletin, March 2012, MO Health & F.W., GOI.*

K. Literacy

84. As per census data of 2011, the literacy rate of the Uttarakhand was 79.63% with 88.33% literacy for males and 70.70% literacy for female. In Uttarakhand, there are 15331 primary schools with 1040139 students and 22118 working teachers as per census 2011.

L. Cultural and Archeological Resources

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

86. Living in the mountains mostly in places that are not easily accessible the people of the district have been able to preserve their culture, folk lore, folk songs and folk dances, the last, a distinctive feature of the Uttarakhand.district, being seasonal, traditional and religious, some of the better known being described below:
    - *The Thadiya dance, which is accompanied by song, is performed on Basant Panchami, the festival celebrating the advent of spring. Another dance, is perform on Deepawali and the Pandava Nritya during the winter after harvesting of crop and depicts the principal events of the Mahabharata.*
    - *Other folk dances are Jeetu Bhagdawal and Jagar or Ghariyali. These dances enact mythological stories, the participants, both men and women, put on their traditional colorful dress and dance to the tune of drums and Ransinghas.*
    - *One of the important dance perform during the fairs and accompanied by song is called Chanchari or Jhoda in which both men and women participate.*

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

88. The houses in the hilly areas of Uttarakhand do not build according to any town planning scheme but have been up haphazardly in clusters on level ground at places where water springs are accessible or on the bank of the river in the valleys. The houses are build of stones and are generally double storeyed, a few having three to five storeys, the very low rooms on the ground floor, which are usually 1.8 meters high being used for housing the cattle. Each house has in front of it a courtyard called a Chauk. A mud or stone staircase or a wooden ladder leads to the upper storey, the roof being of wood and stone. The height of the upper storey is generally 2.1 m and the roof is usually a sloping structures of timber covered with Patals (quartzite slabs), the well off use corrugated galvanized iron sheets. Generally the upper storey has a Verandah in front of the upper rooms.
89. The houses in the higher regions are two to three storeyes with balconies all round and paved courtyard in front where people do their threshing, weaving, spinning and other house hold works. A few houses have five or six storeyes, the top most being used as the kitchen. At times the cattle sheds are made at some distance from the villages. The houses are built in rows of half a dozen or so and strikingly picturesque in their fort like appearance.
90. The staple food grains consumed by the people are *Triticum aestivum* (wheat), *Oryza sativa* (rice), *Zea mays* (maize), *Eleusine coracana* (Mandua) and *Echinochloe frumentasea* (Jhangora), the last three being coarse grains generally eaten by the poorer sections. The pulses consumed are urad, gahat, bhatt, soontha, tur, lobia and masor. The hindus of the district mostly vegetarian by habit and preference and although the Muslims, Christians and Sikhs are generally non-vegetarian, those not able to afford eating meat daily due to money or local unavailability often resulting to a vegetarian diet.

M. Economic Development

1. Transportation and Communication

91. Transportation system is a key factor in the socio-economic development of any area. Roads are logically the critical inputs to the growth of all the sectors. Aside from road systems, the State of Uttarakhand is connected to other states via rail and air transportation systems. Dehradun, Haridwar and Kathgodam are the major railway stations connected to various parts of the country. Jolly Grant near Dehradun is the only airport functional in the State.
92. As per statistical diary of Uttarakhand 2011-2012, the overall road network in the State is 337486.92 km. The road network is administered predominantly by the PWD and comprises of 1375.76 km of national highways (NH) 3788.20 km of State Highways (SH), 3289.74 km of Major District Roads (MDR), 2,945.04 km of Other District Roads (ODR), 14543 km of Village Roads (VR) 858.85 light vehicle road (LVR). Other than PWD, Irrigation department (741 km), Cane development Department (885 km), Forest Department (3257 km), Border Road Task Force (BRTF) 1281.32 Km and others like Mandi Parishad/Market council and PMGSY road (1685 km) a total 7849.32 km road is also managed by their respective department. The Border Roads Organization manages about 1,623 km of NHs, SHs, MDRs, and ODRs (class 9 equivalent and above roads having carriage way width 3.75 meter and above).
93. Density of road length per 100 sq. Km. is 45 km which is very low compared to the national average of 97 km. Only about seven percent of the roads in the State are built in two-lane standards while 50 percent are paved. About a third of the higher class paved roads are in poor condition and over 70 percent of the light-vehicle roads need to be repaired or rehabilitated. Due to the lack of road connectivity, vast areas of the State are inaccessible. Such problem influences the population to 'chunk' in far flung areas of the

State remaining to be under-developed and devoid of educational and health facilities and employment opportunities.

94. As per PWD records, the **Table IV-17** give the scenario of roads in Uttarakhand state.

Table IV-17: Transportation in Uttarakhand State

Sl. No.	Items	Year/Period	Unit	Statistics
(A)	**Motor Roads Maintained by PWD**			
	(i) National Highways	2013-14	Km.	1375.76
	(ii) State Highways	2013-14	Km.	3782.24
	(iii) Major District Roads	2013-14	Km.	3269.74
	(iv) Other District Roads	2013-14	Km.	2985.27
	(v) Rural Roads	2013-14	Km.	16177.16
	(vi) L.V. Roads	2013-14	Km.	790.38
(B)	**Motor Roads Maintained by BRTF**			
	(i)Total Length of Roads	2013-14	Km.	1281.32
(C)	**Motor Roads Maintained by Local Bodies**			
	(i) District Panchayats	2013-14	Km.	807.60
	(ii) Urban Local Bodies & Others	2013-14	Km.	2356.13
(D)	**Roads Maintained by Other Departments**			
	(i) Irrigation	2013-14	Km.	741
	(ii) Cane Development	2013-14	Km.	850.12
	(iii) Forest	2013-14	Km.	3270
	(iv) Others	2013-14	Km.	2060.21
(E)	**Postal and Communication Services**			
	(i) Post Offices	2013-14	No.	2719
	(ii)Telephone Exchanges	2013-14	No.	473
	(iii) Telegraph Offices	2013-14	No.	0
	(iv) PCOs	2013-14	No.	5275
	(v) Telephone Connections (Including WLL) by BSNL	2013-14	No.	195855
	(vi) Mobile phone by BSNL	2013-14	No.	902096

***Source:** Uttarakhand at a Glance (2014-15), Directorate of Economics and Statistics, GoU.*

2. Industrial Development

95. The State has finite industrial units due to lack of adequate resources. In the hilly terrains, industries included food processing, fruit processing, medicinal and aromatic plants, and floriculture based industries. In the plain Districts like Haridwar, Udham Singh Nagar, and other places, capital intensive and high-value addition industries are being encouraged by the government.
96. In recent years, Uttarakhand has emerged as one of the most attractive industrial destinations in India. In this regard, the government is encouraging private participation in all industrial activities in the State. The New Industrial Policy announced in 2003 by the State government puts in place the regulatory framework for Uttarakhand's industrialisation. The New Industrial Policy indicates that private resources may be tapped while promoting Integrated Industrial States in Uttarakhand. The State Government provides assistance for establishment of small and medium sized agro-parks, food-parks, which in turn are expected to provide common infrastructure facilities for storage, processing, grading, and marketing.
97. Main and traditional business of the state is, Handicrafts, Handlooms, Wool Based Industries, Khadi and Village Industries. Hydro Power, Tourism are the backbone of

economic development of the state. No recognizable industry is located in close proximity of the sub-project sites.

N. Energy and Electric Power Potential

98. Uttarakhand has an estimated hydro power potential of about 20,200 MW. However, only 1,130 MW has been tapped at present. Mean while, 4,170 MW projects are under implementation and 3,800 MW projects are allotted to Central, State and private sectors. About 39 projects with a potential of 6,374 MW have been identified for PFR under PMs Hydro Initiatives.
99. Although, Uttarakhand is a power surplus State, a lot needs to be done to harness the untapped potential and sale the surplus power to make this a GDP driver sector for the State.

O. Aesthetic and Tourism

100. Tourism is one of the strong pillars of the State economy. The State has high growth potential for tourism, be in nature, wildlife, adventure or pilgrimage tourism. The State received 2,05,46, 323 domestic tourists in the year 2008, 2,19,34, 567 in the year 2009 and 3,02,06, 030 in the year 2010. As per Uttarkhand at a Glance 2012-13 a document issued by Directorate of Economic and Statistics GoU state recieved 5,69,250 tourists in the year 2011-2012 registering a considerable yearly growth. Expenditure on schemes for tourism development and promotion in the State has progressively increased over the years. Some of the major destinations with tourism potential include Haridwar (called 'The Gateway of God'), Rishikesh (the birth place of Yoga), Dehradun, Mussoorie, Almora, Kedarnath, Badrinath, Yamunotri, Gangotri, Jim Corbett National Park, Nainital, Ranikhet, and Pithoragarh.
101. In respect to tourism major tourist destination in Uttarakhand are Devprayag, Khatling Glacier, Narendra Nagar, Sem Mukhem, Chamba, Dhanaulti, Kunjapuri, New Tehri, Surkanda Devi, Chandrabadni, Kempty Fall, Nagtibba etc.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

102. The sub-project have been screened using the ADB's rapid environmental assessment (REA) checklist.
    - The individual environmental screening checklist is provided in Appendix B of this report.
    - **Environmental Impacts related to siting.** The proposed sub-project is not expected to have any impact on the Forests. The site is not located within or adjacent to the cultural heritage site, protected area (national park / sanctuary /biosphere reserve), 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) available or observed within the subproject corridor of impact.

A. Land Acquisition and Resettlement

103. The proposed sub-project location does not exist within the revenue lands as per Government records. There are no critical impacts on agriculture land and resettlement of people as well as dismantling of any structure during land acquisition or due to the proposed sub-project components.
104. The location as per the land availability with ownership status was finalized after site visit by the Social Experts of PIU & PMU (UEAP: ADB).
105. Due to tough and risky hilly terrain, flat land is the major crisis in Uttarakhand. Most of the land belongs to the State Forest Department or surrounded by restricted areas such as reserve forests, protected areas, ecosensitive zones *etc.*, which is again a major time taking process to get forest clearances. Keeping this fact in mind the land available with Revenue department is selected for this purpose. There is no case of private land acquisition.
106. There is no resettlement issue envisaged in case sub-project location. Since there is no encroachment noticed during site visit, also there is no livelihood loss of the community due to commencement of civil work. A consolidated 'Social Due Diligence Report' will be prepared separately for sub-project locations as per ADB's Safeguard Policy Statement, 2009.

B. Environmental Impacts

107. The assessment of environmental impacts due to the implementation of the sub-project has been carried out for potential impacts during the following stages of the project planning and implementation:
    1. **Location Impacts:** Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities.
    2. **Design Impacts and Pre-Construction Impacts:** Impacts arising from the inappropriate designs of proposed activities 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 aesthetic beauty of the proposed 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

Project Implementation Unit under PMU/UEAP: ADB for safe disposal sites.

3. **Construction Impacts:** The impacts are generic to the construction activities at the sub-project location. 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 to be supervised by the Design and Supervision Consultant (DSC). Key impacts during construction are envisaged on the following aspects: (i) Drainage, (ii) Quarry and borrow pit operations, (iii) Slope cutting and their stability (iv) Water bodies and drainage system (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 measures.
4. **Operation and Maintenance Impacts:** Impacts associated with the operation and maintenance of proposed helipads and buildings built under project. Impacts during operation of the helipads and buildings established in the sub-project will be due to lack of appropriate maintenance facilities created including the sites around the helipads, toilets, parking facilities 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 clean-up of waste disposed by the tourists and aesthetics through appropriate maintenance of landscaping.

   As per proposal the helipads constructed under the project will be exclusively used during emergency situation. The impact due to movement of helicopters, noise level will be instantaneous and temporary in nature. Normally the noise level generated during landing and takeoff of helicopter produces a noise level in the range of 90 to 102 dB (A). This impact will be purely temporary and reversible in nature and will have non-significant impact on background noise level in the area at any point of time. No impact is also anticipated on the wildlife due to operation of helicopters.

C. Cumulative Environmental Impact Assessment

108. The cumulative environmental impact assessment (CEIA) examined the interaction between the sub-project's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseable future projects or activities.
109. Since the sub-project will be built in existing government owned land, and areas to be developed as helipad especially for emergency period. 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 helipad and allied services, added residential developments, commercial and business facilities increased densities are expected to develop and enhance the sub-project area. This can be considered a long-term cumulative benefit of the sub-project.
110. Increased tourist influx is expected to impact on environment but at the same time the routes to these destinations are open for a limited time with limited number of tourists. As the locations are mainly en route to pilgrim centres, it is used by trekkers and adventure lovers, who have a different mind set towards outdoors and love for nature. This will be further addressed by the project through regular orientation programs designed both for

the tourists and facility providers, and dissemination of awareness material highlighting the environmental importance of the area.

111. Implementation of the project will not have any bearing on ecology and environment of the locality. The subproject will not involve any displacement of people or disruption of any economic activity such as agriculture land *etc*. The design and constructions are consistent with the surrounding landscape. The project will not influence the flora or fauna of the locality in any way.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

112. The information disclosure, public consultaion at sub-project locations and stakeholder analysis are very significant tasks under any project for proper understanding and transparency in proposed project.

A. Public Participation during Preparation of IEE Report

113. The public consultation and participation includes identification of project affected persons (PAPs) and other interested groups or parties (stakeholders). Informing and providing the stakeholders with sufficient background and technical information regarding the proposed developmental activities; creating opportunities and mechanisms where by they can participate and raise their view points (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.
114. 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 (Safeguard Policy Staement, 2009). The stakeholders of the project include project affected communities and institutional stakeholders such as local bodies, and other line department (Revenue, Forest, Environment etc.). The consultations at micro-level (village level) and macro-level (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.
115. During Project preparation and consultations with the Executing Agency (EA), Implementation Agency (IA), District Administration and other agencies at local levels on selection of sub-project and identification of key issues including addressing the current gaps in provision of basic services like approach road to access the proposed helipad site. The outputs of public consultation during site visits have been summarized below for timely and effective implementation of the project.

Outputs of Public Consultation during Site Visits
(8th Dec, 2015)

Name of the Places	:	Sub-Project site at Milam
District	:	Pithoragarh
Period	:	8th Dec, 2015
Participants	:	Villagers, Shopkeepers and other Line Departments *etc.*

1. Issues discussed:

- Importance of site selection for Helipad and its suitability
- Benifits of Helipad during natural disaster for evacuation and relief i.e. for emergency purposes.
- Issue of site related NOC and related environmental and social concerns
- Area specific socio-economic and environmental problems.
- Local issues of Panchayat and development schemes.
- Land ownership and provision of compensation.
- Scope of local employment generation during conmstruction.

2. Stakeholder's Response:

- Local people are aware and agree for construction of helipads for emergency purposes.

- The approach to the helipad site should be constructed in proper way so that it can easily accessable.
- Peramanent caretaker should be provided so that he can take proper care and maintainence of the helipad.
- Local Panchayat has no objection in construction of Helipad
- During construction employment should be given to the local people.
- Safety issues should be provided to the Helipads that are constructed in the Government Istitutions ground.
- Beautification of these Institutions ground should be in design provision and should be undertaken during construction.

3. Recommendation and Suggestions:

- Illegal cutting of trees and disturbance to wildlife should be strictly avoided.
- Take care of natural resources along with propoer disposal of wastes to be generated during construction and upgradation of helipads.
- Due care should be taken in selection of trees for cutting and minimum number of trees should be cut for conservation of local ecosystem.
- Horns should be blow on blind curve on approach roads to hellpads during passing of heavy machinerles and vehicles.
- Speed breakers to be established on blind curves of approach roads to hellpads and settlement areas etc. for control of road accidents.
- Approches to the helipad should be properly constructed so that during the time of emergency it can be easily accessible.
- Side drains and crossways for escape of rain water are required. Proper drainage is required for water during rainy season.
- Efforts should be taken for generation of employment of local people during construction.

B. Future Consultations and Disclosure

116. The public consultation and disclosure program will remain a continuous process throughout the sub-project to resolve the issues which may raised at any stage (pre-construction, construction and operational stages).

C. Consultation during Detailed Design

117. Focus-group discussions (FGD) with affected persons and other stakeholders to hear their views and concerns, so that these can be addressed in sub-project design wherever necessary. Regular updates on the environmental component of the sub-project will be kept available at the PIU established under PMU (UEAP: ADB).
118. Either PIU or PMU (UEAP: ADB) 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.
119. The PIU or PMU (UEAP: ADB) with assistance of Design Supervision Consultant (DSC) will conduct information dissemination sessions in the sub-project area. During EMP implementation PIU, DSC, and PMU shall organize public meetings and will appraise the communities about the progress on the implementation of EMP in the sub-project works.

D. Consultation during Construction

120. 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.

121. Small 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 sub-project monitoring and evaluation.

E. Project Disclosure

122. After getting all clearance and final designing of the sub-project, all details related to be project will be disclosed on the websites by the Executing Agency (SDMA or PMU) and ADB. The local communities will be continuously consulted regarding location of alternatives, construction camps, access to site and other likely disturbances which may be raised during construction. The some information related to distribution of information, public consultation and stakeholder's analyses are given in ***Appendices – D & E***.
123. For the benefits 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 and PMU (UEAP: ADB) Office; (ii) District Magistrate Office; and, (iii) Design & Supervision Consultant (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 create awareness among general public. Electronic version of the IEE will be placed in the official website of the SDMA or PMU (UEAP: ADB) and the official website of ADB after approval of the IEE by ADB. The PIU will issue notification on the locality-wise start date of implementation of the sub-project. Copies of the IEE will be kept in the PIU and PMU (UEAP: ADB) Office and will be distributed to any person willing to consult the IEE.

VII. ENVIRONMENTAL MANAGEMENT PLAN & GRIEVANCE REDRESS MECHANISM

A. Institutional Arrangement

124. The institutional arrangements specify the arrangements for the implementation of environmental provisions of the proposed sub-project. The Executing Agency (EA) - State Disaster Management Authority (SDMA) will work closely with Project Management Unit (PMU: UEAP-ADB). The PMU (UEAP: ADB) is responsible for effective implementation of environmental safeguards related to the requirements of the civil aviation infrastructure sub-project. The detailed institutional arrangement and other responsibilities have been described below.

- The sub-project will be implemented and monitored by PIU (UEAP: CA), which will be supported by Design and Supervision Consultant (DSC) and overall management support shall be provided by PMU (UEAP: ADB).
- The safeguard specialists of PMU (UEAP: ADB), and PIU (UEAP: ADB) will monitor and support the implementation programme of environmental covenants with assistance of Design and Supervision Consultant (DSC).
- The Executing Agency - PMU (UEAP: ADB) shall be responsible for ensuring compliance to environmental requirements of the ADB as well as central and 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 Executing Agency - PMU (UEAP: ADB) 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 Implementation Agency (IA) and the civil works contractors in this regard. All applicable statutory clearances including environmental clearances, forest clearances, consents and permits or No-Objection Certificate (NOC) from National, State and Local levels to be required atleast 2 month before commencement of civil works at sub-project locations by the civil works contractor or project proponent in line with india's National, State and Local laws and regulations and in accordance with ADB's Safeguard Policy Staement 2009 requirements.

1. Executing Agency (EA): State Disaster Management Authority (SDMA) -Project Management Unit (UEAP: ADB)

- The Executing Agency complies with all applicable legislations and its conversant with the requirements of the EMMP.
- To assesses all activities requiring special attention as specified or requested by the Design and Supervision Consultant (DSC) or safeguards specialist of Project Management Unit (UEAP: ADB).
- On the recommendation of the Environmental Expert (EE), Design and Supervision Consultant (DSC) and Safeguards Specialist of Project Management Unit (UEAP: ADB) through the DSC order, the contractor to suspend any or all works on site if the contractor or his sub-contractors or suppliers fail to comply with the said contractual stipulations with respect to environment and EMMP.
- To ensures along with the Design and Supervision Consultant (DSC) that EMMP and all necessary environmental stipulations are carried in bidding documents and contract documents of the contractor.

- Addressing of complaints and redressal of grievances for the project.

2. Implementation Agency (IA): Project Implementation Unit (Civil Aviation)

- Complies with all applicable legislation and is conversant with the requirements of the EMMP.
- To assesses all activities requiring special attention as specified or requested by the Design and Supervision Consultant (DSC) or safeguards specialist of Project Management Unit (UEAP: ADB) for the duration of the contract.
- To 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 engineers of DSC or Safeguards Specialist of PMU (UEAP: ADB).
- Act as supervising & monitoring agency as delegated in EMMP.

3. Design and Supervision Consultant (DSC)

- To guides PMU (UEAP: ADB), PIU (UEAP: ADB) 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 may be forwarded to the project manager of PIU (UEAP: ADB) on weekly basis.
- To enforces and monitors compliance the requirements of the EMMP at project site.
- To assess the contractor's environmental performance in consultation with environmental expert.
- Documents in conjunction with the contractor, the state of the site prior to commencing construction activities.

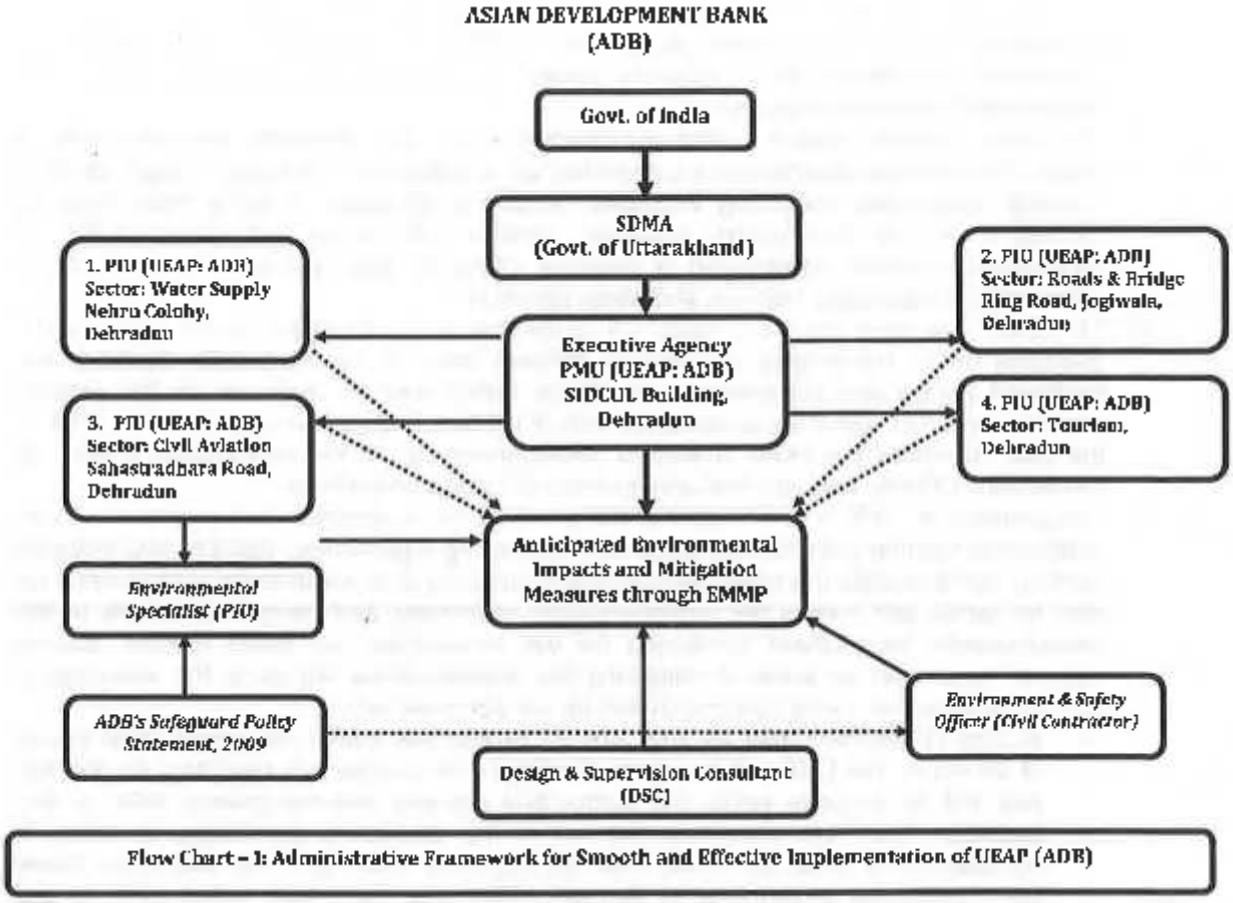
4. Environmental Expert of Engineering (DSC)

- Briefs the contractor about the requirements of the environmental specification and EMMP as applicable.
- To facilitate the statutory compliances related to civil works to PIU (UEAP: ADB) and contractors.
- To advise 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 project in terms of environmental compliances with the EMMP to the DSC, PMU and PIU and provides technical advice relating to environmental issues to the engineer.

5. Civil Work Contractor

- To depute a full time suitable, qualified and experienced environmental safeguard Specialist for the effective implementation of EMMP at project site 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.

- To ensure any sub-contractors or suppliers, who are utilized within the context of the contract comply with the environmental requirements of the EMMP. The contractor will be responsible for non-compliance on their behalf.
- Provides environmental awareness training to staff.
- To bears the costs of any damages or compensation resulting from non-adherence to the EMMP or written site instructions.
- To conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment.
- To ensures that the engineer is timely informed of any foreseeable activities that will require input from the environmental expert of DSC.
- To receive complaints/grievances from public, discuss with DSC and PIU and take necessary steps for implementation of remedial measures in consultation with the engineer of DSC and report to the executive Agency on the status in its each monthly report till satisfactory resolution.
- The proposed sub-project will be implemented by the PIU (UEAP: CA). The PIU (UEAP: CA) will be responsible for supervision and monitoring of day-to-day implementation of sub-project including EMMP.
- 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 package based on the sub-project specific monitoring progrtamme) or by the IA for the monitoring works, if not included in the civil works contracts.
- The flow chart of various sectors under PIUs (ADB) of "Uttararakhand Emergency Assistance Project (Funded by ADB) is given below.



Flow Chart – 1: Administrative Framework for Smooth and Effective Implementation of UEAP (ADB)

B. Environmental Management Plan (EMP)

125. The "Environmental Management Plan" (EMP) is a key to ensure a safe and clean environment. The desired results of mitigation measures may not be achieved without until unless formulations of a proper management plan and its effective implementation. The EMP envisages a plan for sound environmental management practices and the proposed mitigation measures (*i.e.* generic and sub-project specific) may reduce the potential impacts due to the project activities. Based on the existing baseline environmental condition of the sub-project locations, through site survey, various project activities during preconstruction, construction and operation phases of the project, environmental checklist as per the ADB's guidelines environmental impacts are anticipated. The mitigation measures are suggested to minimize the impact. The project activities considered during improvement stage are location of construction camp, obtaining appropriate clearances from regulatory bodies' prior executing construction work, and determination of safety measures.

126. The environmental impacts during construction stage are temporary and reversible in nature. Important product activities considered are establishment of labors camps, removal of some herbaceous and bushy vegetation, cutting of hill slopes to some extent may be envisaged, borrow and quarry operation, crushing of stones and transportation of construction material, construction of drainage channels, and operational movements of construction equipments, vehicles and water supply *etc.*

127. The EMP designed for the project will guide the environmentally-sound construction practices under sub-project and ensure efficient lines of communication between the proposed design and supervision consultants (DSC) also an engineer for the project, contractors, and Project Implementation Unit (PIU) and Project Management Unit (PMU). the EMP identifies the three phases of development as: (i) Pre-construction Phase (ii) Construction Phase and (iii) Post-construction or Operational Phase..

128. The purpose of EMP 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 sub-project; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the sub-project; and (iv) ensure that safety recommendations are complied with.

- A copy of the EMP must be kept at each project site during the construction period at all times. the EMP 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 environmental damages.

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 Govt. of*

Uttarakhand and Govt. of India, local levels and gram sabha etc. during sub-project implementation.

- *Compliance with all mitigation measures and monitoring requirements set out in the EMMP.*
- *Submission of a method statement detailing how the sub-project 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 of 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.*

129. The detailed provisions for specific environmental issues are outlined in the EMMP table of impacts and mitigation measures. The key clauses are outlined in the following sections.

- **Quarry and Borrowing**

  - ✓ The contractor will identify and seek prior approval of the engineer for quarrying and borrowing operations. The quarry and borrowing will be carried only from locations approved by the Department of Geology & Mining (if required). Any deviation from the provisions will be immediately notified and approval of the engineer is to be sought.
  - ✓ 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 (top soil, fill material, gravel, aggregates and other construction materials) shall not be allowed during rainy season unless covered by a suitable material. The storage on private property will be allowed if written permission is obtained from the owner or authorized party.
  - ✓ Borrow areas and quarries shall be sited, worked, and restored in accordance with the specifications and as per the closure plan (approved by engineer). spoils shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements.

- **Debris Disposal**

  - ✓ The dismantling of existing structures: debris disposal shall be maximum utilized and disposed as per norms after consultation with DSC, PIU and PMU's Safeguard Specialist. Due care shall be taken that any material falling under hazardous waste category is disposed in accordance with

the Hazardous Wastes (management, handling and transboundary movement) Rules, 2008 and amendments till date Hazardous Wastes (management, handling and transboundary movement) Rules, 2008 and its amendments till date and applicable norms.

- **Precautions for Protection of Environmental Measures**

  - ✓ 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 and for cleaning activities and operation of equipments, the contractor will utilize such practical methods and devices as are reasonably available to control, prevent and otherwise minimize air and noise pollution effectively.
  - ✓ 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 (DSC).

- **Air, Water, and Noise Pollution, and Soil Contamination**

  - ✓ All works will be carried out without unreasonable noise and air, water and soil pollution subject and without prejudice to any other provision of the contract and the law of the land and its obligation as applicable.
  - ✓ The contractor will take all precautions outlined in the EMMP to avoid the air, water, soil and noise pollution.
  - ✓ The contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the engineer of DSC and PIU/PMU (UEAP: ADB) in the form of montly progress report and after one year a consolidated report to be submitted by PMU (UEAP: ADB) to the funding agency (ADB).
  - ✓ The contractor shall reduce the dust emission due to construction activities by regular water sprinkling nearby project affected areas.
  - ✓ All the construction equipments and vehicles shall have Pollution under Control (PUC) certificate to ensure that no air pollution is caused due to operation of their equipments and vehicles.
  - ✓ All the construction equipments and vehicles should remain all time in good conditions up to satisfaction of site engineers.
  - ✓ The contractor shall indemnify and keep indemnified the employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

- **Occupational and Community Health and Safety during Construction**

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 working areas, through application of preventive and protective measures consistent with international good practices, as reflected in internationally recognized standards. the contractors, engineer (DSC), EA and IA 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 to 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 working sites and workers camps and having qualified first aider to give first aid at the time of any accident. The contractor shall also organize periodic visits by a qualified registered medical practitioner to the site and workers camps, contact information of doctor, availability & location of first aid box shall be displayed in appropriate language both at work site and workers camps.*
- *The 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. The contractor will ensure proper sanitation and would provide soak pits and septic tanks for disposal of waste water and sewage.*
- *The 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 related to health and safety.*

The contractor will also ensure that the interests of the community are disturbed to the minimum as envisaged in the EMMP provide barricade, signage and safety information in and around the construction site and also to prevent local people entering into the construction site.

- **Post-construction Clearance**

  - ✓ 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.
  - ✓ The 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 PIU a certificate to this effect from the owner.

C. Environmental Monitoring Programme

130. 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 Table below.

131. 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 ambient air, water, noise and soil. Indicators and targets for environmental performance are provided in the EMMP.

132. 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 (DSC). The environmental monitoring plan is outlined in the Table given below.

Table VII - 1: Environmental Monitoring Programme

S. No.	Indicators	Parameters to be Monitored	Frequency	Responsibility
I. Pre- Construction Stage				
1.	Legislation, Permits and Agreements	Permissions,/NOCs/Consents other statutory requirement.	Once in Pre-Construction Stage	Civil Work Contractor, DSC, IA & EA
2.	Environmental Baseline Data Generation	Ambient Air Quality, Noise level, Water Quality & Soil characteristics as per parameters outlined in EMMP.	Once in Pre-Construction Stage	Civil Work Contractor
3.	Debris Disposal	Safe disposal of construction wastes including bituminous wastes.	Random checks	Civil Work Contractor
II. Construction Stage				
1.	Legislation, Permits and Agreements	Permissions,/ NoCs/Consents other statutory requirement	Continuous	Civil Work Contractor, DSC, IA & EA
2.	Dust Suppression	No. of tankers for water sprinkling. Timing of sprinkling, Location of sprinkling (log books to be maintained)	Random checks	Civil Work Contractor
3.	Ambient Air Quality (AAQ)	$PM_{2.5}$, PM_{10}, SO_2, NO_x and CO	Once in a Quarter where work is in progress and near sensitive receptors; and at the construction camp sites (except monsoon) for the entire construction period	Civil Work Contractor, to be monitored through approved Monitoring Agency.
4.	Ambient Noise Level	Equivalent Day & Night Time Noise Levels	Once in a quarter where work is in progress and near sensitive receptors during construction stage	Civil Work Contractor, to be monitored through approved Monitoring Agency
5.	Water Quality Monitoring	TDS, TSS, pH, Hardness, BOD and Faecal Coli Form	Once in a quarter where work is in progress and near sensitive receptors	Civil Work Contractor, to be monitored

S. No.	Indicators	Parameters to be Monitored	Frequency	Responsibility
			during construction stage	through approved Monitoring Agency
6.	Soil Testing	Available Nitrogen, Phosphorus, Carbon, heavy metals (including Lead) and Pesticides.	Once in a quarter where work is in progress and near sensitive receptors during construction stage	Civil Work Contractor, to be monitored through approved Monitoring Agency
7.	Heritage Protection (if needed)	Visual inspection of works, compliance with ASI regulations and norms	Continuous	DSC/ASI/PIU
8.	Supply of PPE	Usage of PPE on site, adequacy of equipments.	Continuous	Civil Work Contractor
9.	Establishing Medical Facilities	Access to health facilities for the construction workers	Continuous	Civil Work Contractor
10.	Accident Record	No. of fatal accidents at work site, No. of injuries, No. of disabilities.	Continuous	Civil Work Contractor
11.	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	Civil Work Contractor
III. Operation & Maintenance Stage				
1.	Water Quality Monitoring	All parameters as per CPCB standards.	Once in year during operation stage	PMU, SDMA
2.	Disposal of Solid Waste (if any)	Proper disposal of Solid Waste (domestic) generated shall be ensured in accordance with the prevalent norms.	Continuous	Civil Aviation Department
3.	Ambient Air Quality (AAQ)	$PM_{2.5}$, PM_{10}, SO_2, NO_x and CO	Once in a Quarter at the Helipad	Civil Aviation Department
4.	Ambient Noise Level	Equivalent Day & Night Time Noise Levels	Once in a quarter at the helipad	Civil Aviation Department

Note: *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.*

D. Environmental Budget

133. 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.
134. 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. 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.
135. These are small scale construction projects; therefore, it is not expected to cause much significant impacts on ambient air, water, soil and noise levels. The main EMMP cost will arise from monitoring of environmental parameters (air, water, soil and noise level).
136. 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 of this, 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 study. 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 below.
137. 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 estimated budget for environmental monitoring and management of sub-project as per contract packages are presented below:

Table VII-2: EMMP Cost for Construction and Upgradation of Helipad

Sl. No.	Particulars	Stages	Unit	Quantity	Rate (INR)	Cost (INR)*
A.	Legislation, Permits and Agreements	Consent to Establish and Consent to Operate for plants and machinery of the contractor	-	-	-	-
B.	**Environmental Baseline Data Generation**					
1	Ambient Air Quality monitoring	Pre-Construction	Per Sample	2	15,000	30,000
2	Noise Quality monitoring			2	5,000	10,000
3	Water Quality monitoring			1	9,200	9,200
4	Soil			1	8,000	8,000
5	Dust Suppression at sub-project sites	Construction and defect liability phases	Rs. (Lump sum)		1,50,000	1,50,000
					Sub-total	***2,07,200***
C.	**Environmental Monitoring**					
1	Air quality	Construction	Per sample	6	15,000	90,000
2	Noise Levels			6	5,000	30,000
3	Water Quality			3	9,200	27,600
4	Soil			3	8,000	24,000
5	Ambient Air Quality	Operation/ Defect Liability Period	Per Sample	3	15,000	45,000
6	Water quality			3	9,200	18,400
7	Ambient Noise Quality			3	5,000	15,000
					Sub-total	***2,50,000***
D.	**Capacity Building**					
1	Capacity Building expenses for 2 sessions	EMP Training at Site Implementation of EMMP for PIU and Engineer	Lump sum in Rs.	2	1,00,000	2,00,000
					Sub-total	***2,00,000***
					TOTAL INR	**6,57,200**

E. Environmental Monitoring and Reporting Process

138. The PMU (UEAP: ADB) will monitor and measure the progress of EMMP implementation. PIU (UEAP: ADB) 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 PIU-CA, who will take follow-up actions, if necessary. PIU (UEAP: ADB)/IA will submit quarterly monitoring and implementation reports to PMU. The PMU will submit semi-annual monitoring reports to ADB based on reporting of PIU (UEAP: ADB)/IA and its own site inspections, assessment of the implementation performance. PMU (UEAP: ADB) will also take corrective actions as required.
139. Monitoring reports will be posted in a location accessible to the public.
140. 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. The Standardized EMMP to guide the contractor in mitigating Environmental Impacts is given in ***Table VII -3***.

Table VII-3: Standardized EMMP to Guide the Contractor in mitigating Environmental Impacts

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
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/ quaries etc. – Contractor	PMU	IA, Contractor
		Proof of compliance to statutory requirements must be forwarded by the facility owner contractor to PMU/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	PIU, IA & PMU	
1.2	Education of site staff on general and Environmental Conduct[2]	Ensure that all site personnel have a basic level of environmental awareness training	ESO-Contractor and EE EE to deliver	IA & PMU	Contractor, IA
		Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitized to any potential hazards associated with their task	Environment and Safety Officer of Contractor, and EE	PIU, IA & PMU	Contractor
		No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor	Contractor and EE	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	Contractor and EE	IA & PMU	

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

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		facilities provided for them, as opposed to ad-hoc alternatives (e.g. use of firewood for cooking, the use of surroundings as a toilet facility are forbidden); • Trespassing on private/commercial properties adjoining the site is forbidden; and • Other than pre-approved security staff, no workers shall be permitted to live on the construction site. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do			
1.3	Social Impacts[3]	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 & PIU	IA & PMU	Contractor
		A communications strategy is of vital importance in terms of accommodating traffic during road closure. The road closure together with the proposed detour needs to be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.	Contractor with the Engineer, EE & PIU	IA & PMU	Contractor
		Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Contractor with the Engineer, EE & PIU	IA & PMU	Contractor
		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	Engineer and EE	IA & PMU	

[3] It is important to take notice of the needs and wishes of those living or working adjacent to the site. Failure to do so can cause disruption to Works.

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		cloth, temporary walls, or other suitable materials prior to the beginning of construction.			
		Special attention shall be given to the screening of highly reflective materials on site.	EE	IA & PMU	
1.4	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created and the architectural/archaeological character of the surroundings	Design will include provisions for ensuring effective maintenance and protection of the assets created so as to ensure the long term sustainability.	Contractor, Engineer, EE, and PIU	IA & PMU	
2.	**Design Impacts and Pre-construction Impacts**				
2.1	Layout of components to avoid impacts on the aesthetics of the site	The project components siting will avoid impacts on the aesthetics of the site, ensure minimal impacts and in compliance with statutory and regulatory requirements.	Engineer, FF, and PIU	IA & PMU	
2.2	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, and addition of paved surfaces	Design of proposed components will enable efficient drainage of the sites and maintain natural drainage patterns.	Engineer, EE, and PIU	IA & PMU	
2.3	Selection of materials and construction technologies if not carefully chosen, will adversely impact the aesthetic appeal of the destinations	Selection of materials will be from approved sources and construction technologies proposed will strictly conform to the Uttarakhand architecture. Any new landscaping elements will only utilize native species. Material selection would be done keeping in view that no asbestos (except as allowed), and CFC is used.	Engineer, EE, and PIU	IA & PMU	
2.4	Socio cultural resources- Ground disturbance can uncover and damage archaeological and historical remains	Consult Archaeological Survey of India (ASI) and/or concerned Dept. of Uttarakhand Govt. as applicable to obtain an expert assessment of the archaeological potential of the site; Consider alternatives if the site is found to be of	Engineer, EE, and PIU	Contractor, IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		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.			
2.6	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 PIU	IA & PMU	
2.6	Site clearance activities, including delineation of construction areas	Any removal of vegetation or tree felling shall be done after taking statutory permissions if required. All works shall be carried out such that the damage or disruption of flora other than those identified for cutting is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Environmental 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	Contractor	Engineer, EE, and PIU	Contractor
3	**Construction Impacts**				
3.1	Construction Camps - Location, Selection, Design and Layout	Siting of the construction camps shall be as per the guidelines below and details of layout to be approved by 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 500 m away from watercourses. Construction camps will be located away from	Contractor with the Engineer and EE	PIU, IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		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	
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 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.	Contractor with the Engineer	PIU, IA & PMU	
3.4	Stockpiling of construction materials	Stockpiling of construction materials does not impact obstruct the drainage and Stockpiles will be covered to protect from dust and erosion.	Contractor with the Engineer	PIU, IA & PMU	
3.5	Quarry operations	Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic	Contractor with the Engineer	PIU, IA & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		arrangements. The Contractor shall obtain materials from approved quarries only after consent of the Department of Mines and Geology and District Administration. Adequate safety precautions will be ensured during transportation of quarry materia 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 Ground Water Department for the extraction and seek their approval for doing so and submit copies of the permission to DSC.	Contractor with the Engineer	PIU, IA & PMU	
3.7	Soil/Land Erosion	Slope protection measures will be undertaken as per design to control soil erosion.	Contractor with the Engineer	FPIU, IA & PMU	
3.8	Water Pollution from Construction Wastes	The Contractor shall take all precautionary measures to prevent entering of wastewater into streams, water bodies or the irrigation system during construction Contractor shall not wash his vehicles in river/stream water and shall not enter riverbed nearby the water resource area for that purpose.	Contractor with the Engineer	Engineer, PIU & PMU	
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	Contractor	FF of DSC, Engineer, PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		at least 300 m away from rivers/streams and irrigation canal/ponds if any Contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and refueling shall be carried out in such a manner that spillage of fuels and lubricants does not contaminate the ground. Wastewater from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be collected and separated through an oil interceptor before discharging it on land or into other treatment system as per specified standards and UEPPCB and ULB norms if any.			
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, PIU & PMU	
3.11	Generation of dust	The Contractor will take every precaution to reduce the levels of dust at construction site Regular sprinkling of water and Stockpiles of soil will be kept covered in such a manner to minimize dust generation.	Contractor	Engineer, PIU & PMU	Contractor
3.12	Emission from Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery used for construction shall confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 shall be strictly adhered to. The use of silent/quiet equipment compliant with India ambient noise standards and standards specified for manufacturers shall be encouraged in the sub Project. The Contractor shall maintain a record of PUC	Contractor	Engineer, PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		for all vehicles and machinery used during the contract period which shall be produced for verification whenever required.			
3.13	Noise Pollution	The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the MoEF/CPCB noise standards and all Vehicles and equipment used in construction shall be fitted with exhaust silencers. At the construction sites noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am. Noise limits for construction equipment used in this project will be in conformity to the BIS/SPCB/CPCB standards Regular monitoring of ambient noise levels to ensure compliance to Uttarakhand Environment Protection &Pollution Control Board standards.	Contractor with the Engineer	EE, PIU & PMU	
3.14	Material Handling at Site	Workers Employed on mixing cement, lime mortars, concrete etc., will be provided with protective footwear and protective masks and goggles. Workers, who are engaged in welding works, will be provided with welder's protective eye-shields. Workers engaged in stone breaking activities will be provided with protective goggles, masks, and clothing. The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions and applicable regulations. The Engineer will be given at least 5 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.	Contractor	Engineer, PIU & PMU	
3.15	Disposal of Construction Waste/Debris/Cut Material	The Contractor shall confirm that Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any	Contractor	Engineer, PIU & PMU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		construction waste will be disposed around the project site indiscriminately.			
3.16	Safety Measures During Construction	Personal Protective Equipment for workers on the project and adequate safety measures for workers during handling of materials at site will be taken up. The Contractor has to comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations trenches and safe means of entry and egress. The Contractor has to comply with all regulations for the safety of workers. Precaution will be taken to prevent danger of the workers from fire, etc. First aid treatment will be made available for all injuries likely to be sustained during the course of work. Contractor shall also organize periodic visits by a qualified registered medical practitioner to the site and workers camp. Contact information of Doctor, availability & location of first aid box shall be displayed in appropriate language both at work site and workers camp. The Contractor will conform to all anti-malaria instructions given to him by the Engineer The Contractor will also ensure that the interests of the community are preferably not disturbed, and if unavoidable then disturbed to the minimum. Provide traffic management personnel, barricade, appropriate signage and safety information in and around the construction site and prevent local people entering into the construction site.	Contractor	Engineer, PIU & PMU	Contractor
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,	Contractor	Engineer, PIU & PMU	Contractor

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		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.			
3.18	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; and Inform FPIU/DSC, and take any action they require ensuring its removal or protection in-situ.	Contractor	Engineer, PIU & PMU	
3.19	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, PIU & PMU	
3.20	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, PIU & PMU	Contractor
4	**Operation and Maintenance impacts**				
4.1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise level water (both ground, surface water) quality and soil, in the subproject area as suggested in pollution monitoring plan through an approved monitoring agency.	Pollution Monitoring Agency appointed by IA	SDMA, PMU	
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	IA and EA	SDMA, PMU & GoU	

S. No.	Activity	Management/ Mitigation	Implementation Responsibility	Supervision Responsibility	Source of Fund
		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 infrastructure to be developed under the sector; (b) prepare master plan for redevelopment of Kedareth 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	IA 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	IA	

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

F. Disaster Management Plan

141. During Natural Calamity / Disaster, helicopters are requisitioned to provide aid by the Requisitioning Authority (RA). Helicopters can operate from the Disaster sites and temporary/ unprepared helipads in a hostile environment. It is for this reason that "Operation Circulars" is specific for Utilization of Helicopters in Disaster Management. The Operation Circular No. 7/2013, Civil Aviation Department, Government of India dated 14th August 2013 is referred.
142. The instruction given in this circular are only a guideline to be followed by RA/ State Government, DGCA, Operators and other stake holder participating in Disaster Management. Each calamity/ disaster will have its own peculiarities and intensity and would require a specific response. The Circular is attached as ***Appendix F.***

G. Emergency Management Plan

143. The object of helipad emergency planning is to minimize the effects of an emergency, particularly in respect of saving lives and maintaining helicopter operations.
144. The helipad emergency plan sets forth the procedures for co-coordinating the response of different helipad agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to the emergency. Each helipad emergency plan should be a coordinated programme between the helipad and the surrounding community. This is desirable as the planning and procedures needed to handle major emergency situations on the helipad.
Responsibility: Each helipad operator (UCADA/ District Authority) should be responsible for establishing emergency plans and procedures to deal with all unusual conditions at the Helipad and for co-coordinating the plan with surrounding community authorities. The Helipad operator (UCADA/ District Authority) also have the responsibility for assignment of emergency personnel and equipment provided by all concerned departments and agencies, and for providing maximum helicopter emergency services and mutual aid.

Establishment of Helipad Emergency Plan:
The purpose of an airport/heliport emergency plan is to ensure that there is:

- Orderly and efficient transition from normal to emergency operations;
- Delegation of airport emergency authority;
- Assignment of emergency responsibilities;
- Authorization by key personnel for actions contained in the plan;
- Co-ordination of efforts to cope with the emergency; and
- Safe continuation of aircraft operations or return to normal operations as soon as possible.

It is imperative that the Helipad Authority (UCADA/ District Authority) arrange emergency mutual aid agreements which define responsibilities and/or liabilities of each contributing party with surrounding communities. These agreements should include at least the following:

- Clarification of the political and jurisdictional responsibilities of the several agencies that may be involved in order to avoid problems when an emergency occurs;
- Establishment of the command authority; i.e. a single on-scene commander (with designated alternates if necessary);
- Designation of communication priorities at the accident site;

- Organization of emergency transportation facilities under a pre-designated co-coordinator(s);
- Pre-determination of the legal authorities and liabilities of all co-operating emergency personnel; and
- Pre-arrangements for use of portable and heavy rescue equipment from available sources

H. Performance Indicators

145. The performance indicators of implementation of environmental management and monitoring programme has been given in ***Table VII-4***.

Table VII-4: Performance Indicators of EMMP

Sl. No	Performance Indicators	Target	Achievement in Semi-annually and Annually
1.	Budget	Environmental Budget (EMMP Budget)	Expenditure till date
A. Performance Indicators of Monitoring Plan			
2.	Ambient Air Quality (AAQ)	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
B. 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	Number of Sessions completed and

Sl. No	Performance Indicators	Target	Achievement in Semi-annually and Annually
		covered Total Number of contractors, PIUs and DSCs to be covered	Number of contractors, PIUs and DSCs.
14.	Implementation of EMP mitigation Measures	All items of Environmental Management Plan with timeline and its respective regulatory standards like for Amebient air Qaulity – NAAQS, 2009 standards, Drinking water – IS:10500 etc, Residual Chlorine – UEPPCB standards and CPHEEO manual for handling.	Implementation status of EMP items till date
15.	Reporting	List and number of Reports to be submitted	List and number of reports submitted

I. Grievance Redressal Mechanism

146. The EA has established a mechanism to receive and facilitate resolution of affected peoples concerns, complaints, and grievances about the Project's environmental performance (Appendix C). 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.
147. The PMU and PIU (UEAP: ADB) will make the public aware of the GRM through public awareness campaigns. Grievances will be filed in writing using the Complaint Register and Complaint Forms or by phone with any member of the PMU and PIU (UEAP: ADB). The contact phone number of the PIU and the PMU have been publicized through the media and placed on notice boards outside their offices and at construction sites ad will serve as a hotline for complaints. . The safeguard documents made available to the public in an accessible version includeing 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.
148. The PIU has already convened Grievance Redressal Committees (GRC) 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 receipt by the committee formed for the purpose. If the grievance cannot be solved, the PMU is notified to further advice on the situation with higher government and legal bodies.
149. 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.
150. 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 (UEAP: ADB).

151. 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

152. The proposed sub-project components do not involve any interventions in surrounding environment, natural as well and cultural heritage destinations and have less significant (direct/indirect) environmental impacts. It is expected that the proposed sub-project 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 infrastructure development will provide support facility to the State of Uttarakhand, to enhance and develop the tourism sector as a key driver for economic growth on one hand and useful during emergency period on other.
153. 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 project sites, will better the environmental conditions and minimize the pollution related and aesthetic quality *etc*.
154. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the sub-project. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the PMU/PIU (UEAP: ADB) 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.
155. On the basis of the IEE report, It is expected that the proposed project components have only minor temporary and reversible impacts or simply say very less significant environmental impacts on environment. These impacts can be easily mitigated through adequate mitigation measures and regular monitoring during the Design, Construction and Post-construction Phases of the project. It is recommended that PMU/PIU (UEAP: ADB) should have monitoring responsibility in environmental issues of all program components and to ensure the environmental sustenance.
156. The IEE carried out for the sub-project 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 sub-project; 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 sub-project elements have been consulted with the stakeholders and no significant issues requiring redressal in terms of environmental safeguards exist.
157. Based on the findings of the IEE, the classification of the sub-project as Category - B is confirmed, and no further special study or detailed EIA needs to be undertaken to comply the rules and regulations under Government of Uttarakhand, Government of India and ADB's (Safeguard Policy Staement, 2009).
158. The "No-objection Certificates" (NOCs) from the concerned Revenue Department (District Magistrates) and user agencies have been obtained for the commencement of civil work. There is no environmental and social issue at this stage. Thus, the commencement of civil work for 1 helipad location can be started as per target of the Uttarakhand Emergency Assistance Project (Phase – V) on priority basis.

Dipankar Majumdar
Environmental Safeguards Officer
DSC-CA

Dr. Surjit Singh Deepak
Environmental Safeguard Specialist
DSC-CA

Mahesh kumar Dubey

Environmental Specialist, PIU (CA)

APPENDICES

Appendix A

Environmental 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 CCO. HCS projects are a subset category A project 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: Sub-Project : Construction of a new Helipad at Milam village in Pithoragarh district under Uttarakhand Emergency Assistance Project (Phase – IV: Civil Aviation Programme Package No. UK/UEAP-CA/P4)

Processing State: : Sub-Project Appraisal Report (SAR) Preparation

Modality

[ ] Project loan [ ] Program Loan [ ] Financial Intermediary [ ] General Corporate Finance

[ ] Sector Loan [X] MFF [√] Emergency Assistance [ ] Grant

[ ] Other Financing modalities

C. Environment Category

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

Category A	√ Category B	Category C	Category FI

D. Basis for categorization/ Re-categorization (Pl. attach documents)

[√] REA Checklist

[ ] Project and/or Site Description

[ ] Other

E. Comments

Project Team Comments	ESMC Comments
In Civil Aviation Program under ADB Emergency assisted UEAP, the Construction of helipad at Milam village in Pithoragarh district is proposed to strengthen the disaster preparedness capability of the state and to restore visitor's faith/confidence in the tourism safety through provision of better connectivity and presence of rescue, relief and evacuation mechanisms. Through strengthening of disaster risk management system, institutions & infrastructure with Construction Helipads Centres	The Project Category as per ADB Safeguard Policy (SPS) 2009 is "B" and IEE is required.

as envisaged presently, the sub-projects have the potential to benefit the entire State of Uttarakhand by creating image of a safer tourist friendly destination with a strong capability in disaster preparedness. The proposed sub-projects for "Construction of Helipad in Pithoragarh district 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 through EMMP.	

F. Recommended for Approval

Proposed by : (Environment Safeguard Specialist, DSC – CA)		**Reviewed by: (Environment Safeguard Specialist, PIU –CA)**
		Mahesh Kumar Dubey
(Sign of Environment Safeguard Specialist, DSC – CA)		**(Sign of Environment Safeguard Specialist, PIU-CA)**
Date: 14/03/16		Date: 14/03/16
		Mahesh Kumar Dubey
(Sign. Of Deputy Program Manager, PIU-CA, UEAP)		**Verified by : Environment Officer, PMU, UEAP**
Date:		Date: 14/03/16

Endorsed by :Program Manager, PIU-CA, UEAP

Chief Compliance officer: The project is not coming under HCS

Appendix B

Rapid Environmental Assessment (REA) Checklist

Instructions:

- This checklist is to be prepared to support the environmental classification of a project.
- This checklist is to be completed with the assistance of an Environmental Specialist in a Regional Department.
- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- 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 a helipad at **Milam village in District Pithoragarh of the state of Uttarakhand.**
Sector Division:	**Department of Civil Aviation, 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?			The site for upgradation of proposed helipad is not located within or adjacent to the cultural heritage sites, protected areas, wetlands, mangroves, estuarine; core as well buffer zones of the protected areas or any special area for protecting biodiversity.
Cultural heritage site		√	
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
B. Potential Environmental Impacts Will the Project cause…			
Encroachment on historical/cultural area, disfiguration of landscape or potential loss/damage to physical cultural resources?		√	No such area lies within or adjacent the proposed project site.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		√	No disturbance to precious ecology is anticipated due to construction activities under the proposed sub-project.
Alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?		√	No alteration in surface water hydrology of waterways is anticipated by the sub-project activities.

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?		√	The worker-based camp (if established) will be away from the water body and septic tanks and soak pits will be provided in the camp for sewerage disposal facilities.
Increased local air pollution due to various project construction activities?	√		No such impact is anticipated. However, the possibility of minor increase in air pollution due to construction activities under the proposed sub project may not be ruled out,which would be temporary, site specific and reversible in nature. This will be mitigated by taking suitable mitigation measures as per EMMP.
Risk and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		√	No such impact is anticipated.
Noise and vibration due to project construction or operation?	√		No blasting activity is proposed for the project. However possibilities of minor increase in noise level during construction activities under the sub project may not be ruled out, which would be site specific, temporary and reversible. This will be mitigated by using PPEs, noise enclosures, etc.
Dislocation or involuntary resettlement of people?		√	Not involved
Dislocation and compulsory resettlement of people?		√	Not involved
Disproportionate impacts on the poor, women and children, Indigenous people or other valuable groups		√	No such impact is anticipated.
Poor sanitation and solid waste disposal in construction camps and work sites and possible transmission of communicable diseases (such as STIs and HIV/AIDS) from workers to local populations?		√	No such impact is anticipated. Local labour will always give preference so that need of construction camp will not require. Migratory labour will be employed in unavoidable circumstances only. Construction Camps (if established) will be provided with necessary water supply, sanitation, storm water drainage, solid waste management and first aid facilities during the construction period.
Creations of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	No such impact is anticipated. Proper disposal of liquid effluent will be provided at labour camps (if established) for avoiding water stagnation and creation of breeding grounds.
Social conflicts if workers from other regions or countries are hired?		√	No such possibility is anticipated as the local labour will always be given preference to rule out the need for establishment of labour camp at the construction sites. Migratory labour will be employed in unavoidable circumstances

SCREENING QUESTIONS	Yes	No	REMARKS
			only.
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	No such possibility is anticipated as the local labour is gettingpreference as labour during construction activities. Constructioncamps (if established) will be providedwith necessary water supply, sanitation,storm water drainage, solid wastemanagement etc. during the constructionperiod and necessary provision forrehabilitation or restoration aftercompletion of construction.
Risk to community health and safety due to the transport, storage and use and/or disposal of materials such as explosives fuel and other chemicals during construction and operation?		√	No such possibility is anticipated.
Community safety risks due to both accidental and natural causes, especially where structure elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.		√	Community safety risks due to both accidental and natural causes can be anticipated at extreme cases. Safety issues will be taken due care while designing the various components of the project. The proposed helipad is being constructed to ensure safety and evacuation of the tourist and community at the times of natural calamity or accident and emergency. Standard Operation Procedure / Guidelines for operation phase will be prepared by Project Proponent.
Generation of solid waste and/or hazardous waste?	√		Solid waste is anticipated to be generated due to project activities. Generated wastes would be disposed off at proper designated disposal sites. However, no possibility of generation of hazardous waste is anticipated.
Use of chemicals?		√	No chemical is proposed to be used during construction activities.
Generation of wastewater during construction or operation?	√		Waste water is anticipated to be generated during construction activities. Provision of proper disposal of waste water would be ensured through suitable mitigation measures.

Climate change and disaster risk questions	Yes	No	Remarks
The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.			

Climate change and disaster risk questions	Yes	No	Remarks
• Is the project area subjected to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm urges, tsunami or volcanic eruptions and climate changes?	√		The project site lies in the Seismic Zone V as per the Seismic zone map of India and thus prone to earthquake.
• Could changes in temperature, precipitation, salinity or extreme events over the project lifespan affect its Technical and Financial sustainability		√	No such impact is anticipated.
• Are there any demographic or socio-economic aspects of the Project areas that are already vulnerable (e.g. high incidence of marginalized populations, rural urban migrants, illegal settlements, ethnic minorities, women or children)?		√	No such impact is anticipated.
• 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)?		√	The proposed sub project is site specific and thus no such impact is anticipated.
• Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		√	The proposed sub project is site specific and thus no such impact is anticipated.
• Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		√	No such impact is anticipated.
• Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		√	No such impact is anticipated.
• Would weather/climate conditions and related extreme events likely affect the performance of project output(s) throughout their design life time?		√	No such impact is anticipated.

X	Should be categorized as an A project.
√	Should be categorized as a B project.
X	Should be categorized as a B project in an environmentally sensitive area.
X	Should be categorized as a C project.
X	Should be categorized as an A/B project because (give reason) .
X	Requires additional information for classification. Therefore, an Environment Specialist should be involved in the PPTA Fact-finding Mission. the Mission Leader should gather additional information during the PPTA Fact- finding Mission

DipankarMajumdar
Environmental Safeguards Officer
DSC-CA

Dr. Surjit Singh Deepak
Environmental Safeguard Specialist
DSC-CA

Environmental Specialist PIU (CA)

Appendix C

UCADA ADVERTISEMENT

परियोजना प्रबन्धन इकाई
उत्तराखण्ड डिजास्टर रिकवरी प्रोजेक्ट एवं
उत्तराखण्ड इमरजेन्सी असिस्टेंस प्रोजेक्ट
सिडकुल बिल्डिंग 29 आई.आई.ई. (आई.टी. पार्क) सहस्त्रधारा रोड
देहरादून-248001 उत्तराखण्ड

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

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

केन्द्रीय समस्या निवारण प्रकोष्ठ दूरभाष संख्या 0135-2708376

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

जनपद	नोडल अधिकारी	दूरभाष संख्या
रूद्रप्रयाग	श्री आशीष सेमवाल / राहुल [illegible]	8859504022 / 8859504026
चमोली	श्री नन्द किशोर जोशी	9411352136
उत्तरकाशी	श्री देवेन्द्र पटवाल	9410350338
बागेश्वर	[illegible]	8193917518
पिथौरागढ़	श्री आर. एस. राणा	9412079945
अल्मोड़ा	श्री राकेश जोशी	9412929707
चम्पावत	श्री मनोज पाण्डे	9412347265
नैनीताल	श्री दिनेश कुमार	9456923808
उधमसिंह नगर	श्री अनिल शर्मा	7417071470
टिहरी	श्री [illegible]	—
हरिद्वार	—	—
देहरादून	सुश्री दीपिका [illegible]	9412954530, 0135-2710334
पौड़ी	डा. [illegible]	9412031[illegible]

लोक सूचनार्थ हेतु प्रपत्र
(Leaflet for Public Information)

एशियाई विकास बैंक द्वारा सहायतित
"उत्तराखण्ड आपातकालीन सहायता परियोजना"
(Uttarakhand Emergency Assistance Project Assisted by ADB)

सूचनार्थ संख्या: 0135–2600661 E-Mail : pio.ca.uk@gmail.com

परियोजना कियान्वयन इकाई
उत्तराखण्ड नागरिक उड्डयन विकास प्राधिकरण – देहरादून
(Project Implementation Unit: Uttarakhand Civil Aviation Development Authority)

1.प्रस्तावना (Introduction)

उत्तराखण्ड एक नवसृजित राज्य है, जो 9 नवम्बर 2000 को पूर्ण रूप से पृथक राज्य के रूप में अस्तित्व में आया। जिसका अधिकांश भाग मध्य हिमालय का पर्वतीय क्षेत्र है। अधिकांश भू–भाग पर्वतीय अंचल में होने के कारण यहां रेलवे एवं वायुयान जैसी सुविधाओं का प्रायः अभाव रहा है। फलस्वरूप सड़क मार्ग ही एकमात्र आवागमन का सुलभ साधन है। राज्य में आवागमन एवं समस्त विकासशील योजनायें सड़कों की उपलब्धता एवं गुणवत्ता पर ही आधारित है। राज्य की विषम भौगोलिक परिस्थिति होने के कारण 15–17 जून 2013 को राज्य का अधिकांश पर्वतीय भू–भाग आपदा से बुरी तरह से प्रभावित हुआ। जिसके परिणामस्वरूप जानमाल की क्षति के साथ कई मोटर मार्ग पूर्ण एवं आंशिक रूप से क्षतिग्रस्त हुये। जो राज्य सरकार के साथ समस्त मानव समुदाय के लिए एक बहुत बड़ी चुनौती साबित हुई। राज्य के पर्वतीय भू–भाग में मौजूदा सड़कों की उचित गुणवत्ता न होने के कारण उक्त नवसृजित राज्य के बहुमुखी विकास हेतु राज्य सरकार द्वारा एशियाई विकास बैंक के वित्तीय सहयोग से उत्तराखण्ड नागरिक उड्डयन विकास प्राधिकरण राज्य में सुलभ आवागमन हेतु विशेषतह आपदाकालीन स्थिति को मद्देनजर रखते हुए पूर्व अनुभवों के आधार पर प्रभावित क्षेत्रों के जनमानस के मध्य उक्त महत्वाकांक्षी परियोजना के अन्तर्गत राज्य के अधीन मौजूदा हेलीपैड्स एवं हेलीपोर्ट्स के सुधारीकरण एवं सुदृढीकरण के साथ–साथ कई नये हेलीपैड्स एवं हेलीपोर्ट्स के निर्माण हेतु वचनबद्ध है। उक्त कार्य हेतु परियोजना से सम्बन्धित सूचना आम जनमानस के सूचनार्थ एवं महत्वपूर्ण सुझाव के लिए इस प्रपत्र के माध्यम से प्रकाशित की जा रही है।

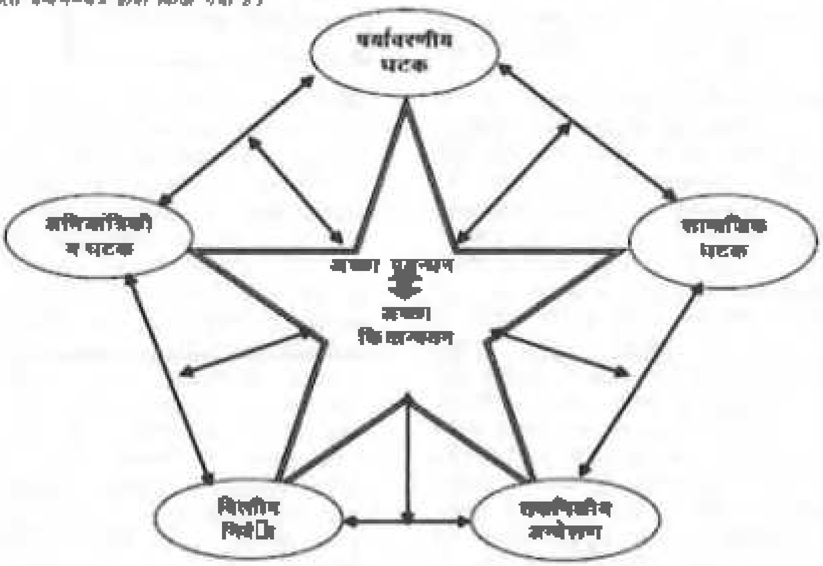
2.उद्देश्य (Objectives)

विकास एवं पर्यावरण एक ही सिक्के के दो पहलू है। यदि प्राकृतिक पर्यावरण के संतुलन एवं संरक्षण की ओर ध्यान केन्द्रित किया जाए तो निश्चित ही विकास के दुष्प्रभावों को नियंत्रित किया जा सकता है। परन्तु विकास की दौड़ में जहाँ नये मोटर मार्गों का निर्माण कार्य अति आवश्यक है। उसी प्रकार से राज्य के दुर्गम एवं पर्वतीय क्षेत्रों में आपदा जैसी समस्या से निपटने के लिए हेलीपैड्स एवं हेलीपोर्ट्स का निर्माण एवं रखरखाव करना भी उतना ही आवश्यक है। अन्यथा आपदा जैसी दुर्घटनाओं से बच पाना सम्भव नहीं होगा। उक्त समस्या के समाधान हेतु उत्तराखण्ड राज्य सरकार ने एशियाई विकास बैंक के वित्तीय सहयोग से उपरोक्त परियोजनान्तर्गत प्रथम चरण (फेज–1) में 12 (फेज–2,3,4 एवं 5) में 48 नव एवं पूर्व निर्मित हेलीपैड्स एवं हेलीपोर्ट्स का कार्य सुधारीकरण एवं सुदृढीकरण हेतु प्रस्तावित किया है। परियोजना के चौथा पैकेज में से कुल 12 स्थलों में सम्बन्धित विभाग/प्रयोक्ता एजेंसी एवं जिलाधिकारियों से निर्माण कार्य हेतु अनापत्ति प्रमाण–पत्र उपलब्ध हो पाये। जिनका संक्षिप्त उल्लेख तालिका–1 में किया गया है।

तालिका–1: "उत्तराखण्ड नागरिक उड्डयन विकास प्राधिकरण" के अन्तर्गत चौथा –चरण में नव–निर्माण एवं सुधारीकरण हेतु हैलीपैडस एवं हैलीपोर्ट्स की सूची

क्र. सं.	प्रस्तावित स्थल	जनपद	श्रेणी (न्यूनतम वांछित क्षेत्रफल)	[illegible]	[illegible]
	अ. कुमाऊं मण्डल				
1	गुंजी	पिथौरागढ़	एच 4 (2500 मीटर)	आई०एल०एफ०एस० देहरादून (श्री पियूष जैन, परामर्शदाता 09818290428 **E-Mail: piyushjain@ilfsindia.com**; डा० सुरजीत सिंह (पर्यावरण विशेषज्ञ 09871012878) डा० सुरेश कौल (सामाजिक विशेषज्ञ 09818053030)	श्री एस० के० सिंह अध्यक्ष सेन्टर फॉर रूरल एण्ड इन्वायरमेन्टल डेवलपमेंट (क्रेड) देहरादून (9219517770 / 9412369319)
2	मिलम		एच–4 (2500 मीटर)		
योग (अ)		*1 जनपद*	*एच–4 – 2*		

नोट: हैलीपैडस एवं हैलीपोर्ट्स के निर्माण हेतु सम्बन्धित विभाग एवं जिलाधिकारियों से प्रस्तावित सरकारी भूमि होने के कारण अनापत्ति प्रमाण–पत्र प्राप्त किया गया है।



प्रवाह मानचित्र – 1: सतत विकास के अन्तर्गत परियोजना के प्रभावपूर्ण क्रियान्वयन हेतु अच्छे प्रबन्धन के लिए विभिन्न घटकों का प्रारूपिक प्रवाह मानचित्र।

➢ परियोजना के प्रमुख उद्देश्य निम्नवत इस प्रकार हैं।

- ✓ राज्य में मौजूदा हेलीपैड्स एवं हेलीपोर्ट्स का पुनरूद्धार एवं सुदृढ़ीकरण के साथ–साथ एवं नये हेलीपैड्स एवं हेलीपोर्ट्स के निर्माण हेतु स्थलों का चयन कर सम्बन्धित विभाग एवं जिलाधिकारियों से निर्माण कार्य हेतु अनापत्ति प्रमाण–पत्र प्राप्त कर परियोजना का प्रधान पूर्ण क्रियान्वयन करना।
- ✓ राज्य के दुर्गम स्थानों में आपदा के दौरान जनता को हेलीकोप्टर/चोपड के माध्यम से प्राथमिक सुविधायें एवं आवश्यकीय राहत कार्य उपलब्ध कराना।
- ✓ राज्य के दुर्गम स्थानों के आर्थिक विकास एवं चार धाम यात्रा हेतु पर्यटन को बढ़ावा देना।
- ✓ ऐसे क्षेत्र जो उच्च आर्थिक गतिविधियों एवं विकास के अन्तर्गत आते हैं उनको अन्य क्षेत्रों से जोड़ना ताकि उनसे होने वाले प्राप्त मुनाफों को राज्य के प्रत्येक भाग तक पहुचाया जाना सम्भव हो सके।
- ✓ उक्त अध्ययन का मुख्य उद्देश्य प्रस्तावित हेलीपैड्स एवं हेलीपोर्ट्स की अभियांत्रिकी, परिवहन, आर्थिकी, सामाजिक एवं पर्यावरण सम्बन्धित गतिविधियों को प्राथमिकता की सूची में सम्मिलित करना तथा विस्तृत परियोजना आख्या (डी0पी0आर0) निर्धारित करते समय स्थानीय जनता के महत्वपूर्ण सुझावों को मद्देनजर रखना।
- ✓ परियोजना से प्रभावित व्यक्ति चाहे प्रत्यक्ष रूप से लाभान्वित न हो लेकिन परोक्ष रूप को साथ मानते हुए परियोजना के क्रियान्वयन के तत्पश्चात आम जनमानस के जीवन में सुधार आना सुनिश्चित है।
- ✓ मुख्यतया आम जनमानस की आजीविका पर प्रभाव और भूमि अधिग्रहण एवं पर्यावरण अवनयन जैसे नकारात्मक प्रभाव यथासम्भव कम से कम हो जैसे प्रयास करना उक्त अध्ययन का प्रमुख लक्ष्य है।
- ✓ एशियाई विकास बैंक के नीति निर्देशों के तहत गार्गिक आबादी (वी0पी0) के अन्तर्गत महिला सशक्तात्मक परिवार बुजुर्ग वर्ग गरीबी रेखा से नीचे जीवनयापन (बी0पी0एल0) करने वाले परिवार और सामाजिक रूप से पिछड़े वर्गों (एस0सी0, एस0टी0) को सम्मिलित किया गया है। उक्त वर्गों के परिवारों पर विशेष ध्यान केन्द्रित है।
- ✓ उक्त कार्यक्रम के अन्तर्गत 3 वर्ष की समयावधि में लगभग 60 हेलीपैड्स एवं हेलीपोर्ट्स का निर्माण कार्य प्रस्तावित है।
- ✓ उक्त कार्यक्रम के तहत प्रस्तावित क्षेत्र में पड़ने वाले वृक्षों के पातन एवं अतिक्रमण जैसे प्रमुख मुद्दों पर सरकार एवं स्थानीय जनमानस के मध्य विचार विमर्श कर निर्माण कार्य को सुनिश्चित करना।
- ✓ उक्त कार्यक्रम के अन्तर्गत समस्त पर्यावरणीय एवं पुनर्वास के संवेदनशील मुद्दों को सिविल कार्यों के क्रियान्वयन होने से दो माह पूर्व निष्पादित किया जाना अति आवश्यक है।

3. पर्यावरण परिदृश्य (Environmental Scenario)

उक्त परियोजना के अन्तर्गत पर्यावरण परिदृश्य का मुख्य उद्देश्य प्राकृतिक पर्यावरण एवं आपदा स्थिति के साथ–साथ सतत् विकास को मद्देनजर रखते हुए बेहतर विकल्पों को पर्यावरण संरक्षण हेतु दृष्टिगोचर करना। जिसमें सुनियोजित योजना, आलेखन एवं परियोजना के क्रियान्वयन के समय विभिन्न अवस्थाओं में निम्नलिखित बिन्दुओं को सम्मिलित किया जायेगा।

- ✓ परियोजना के अन्तर्गत प्रमुख पर्यावरणीय घटकों (जल, जमीन, जंगल, वायु एवं प्राकृतिक संसाधनों का संरक्षण) की पहचान एवं मूल्यांकन करना।
- ✓ प्रमुख पर्यावरणीय मुद्दों (जल, जमीन, जंगल, वायु एवं प्राकृतिक संसाधनों का संरक्षण) पर पड़ने वाले नकारात्मक प्रभावों पर नियंत्रण एवं न्यूनीकरण करना।
- ✓ परियोजना के सफल संचालन हेतु प्रारम्भिक पर्यावरण परीक्षण (आई0ई0ई0), पर्यावरण प्रबंधन योजना (ई0एम0पी0) एवं पर्यावरण प्रभाव विश्लेषण (ई0आई0ए0) जैसे महत्वपूर्ण दस्तावेजों को परियोजना की आवश्यकतानुसार एशियाई विकास बैंक एवं भारत सरकार के निती निर्देशों के अनुरूप

सुनियोजित एवं समयबद्ध तरीके से क्रियान्वयित करना।

पर्यावरण एवं सामाजिक सुरक्षा की दृष्टिकोण से विश्लेषणों का पदानुक्रम

4. प्राकृतिक पर्यावरण के अंग
(Parts of Natural Environment)

(अ) भौतिक पर्यावरण
(Physical Environment)

- जल संसाधन।
- मृदा संरक्षण।
- पर्यावरण प्रदूषण (वायु, जल, ध्वनि इत्यादि)।
- अपशिष्ट पदार्थों का निष्पादन।
- खनिज एवं धातु संसाधन।
- स्थलाकृति इत्यादि।

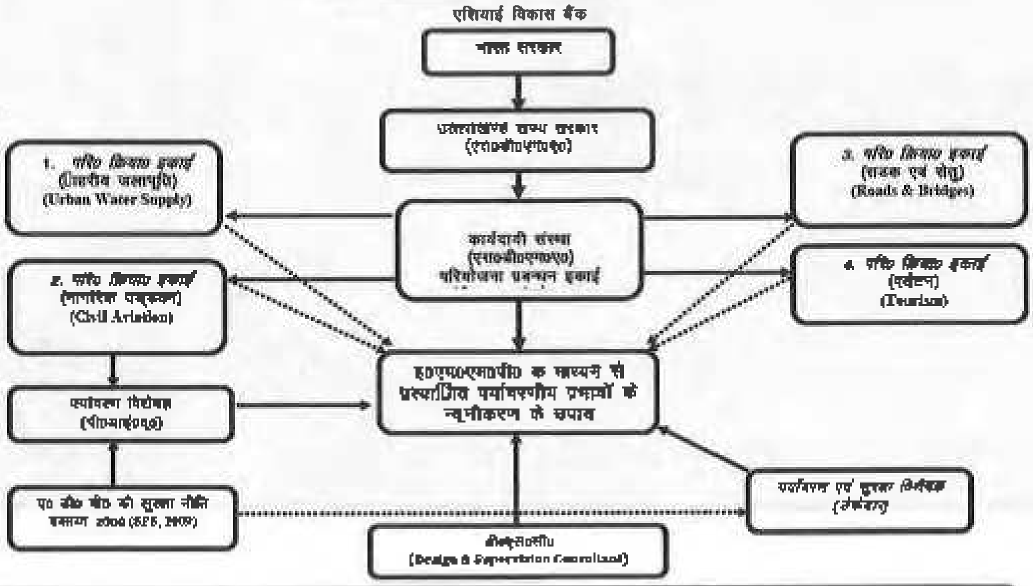
(ब) जैविक पर्यावरण
(Biological Environment)

- प्रस्तावित भूमि में अच्छादित वृक्ष।
- अन्य जीव एवं उनके प्राकृतिक आवास (वेन, जलाकय, घोंसले, बिल, गड्ढेदार भूमि आदि)।
- वन, अभ्यारण्य, राष्ट्रीय पार्क, जैव-मण्डल निवय इत्यादि।

(स) सामाजिक एवं सांस्कृतिक पर्यावरण
(Socio-cultural Environment)

- पेयजल के स्रोत।
- विद्यालय, महाविद्यालय, अस्पताल इत्यादि।
- धार्मिक स्थल (मन्दिर, मस्जिद, गुरूद्वारा इत्यादि)।
- सांस्कृतिक एवं पुरातात्विक स्थल (धरोहर)।
- अवांछित पदार्थों के निष्पादन हेतु अन्य स्थल एवं सिविल कार्य हेतु ली गई भूमि।

लोक सूचनाओं हेतु प्रपत्र
(Leaflet for Public Information)



प्रवाह मानचित्र – 2: उत्तराखण्ड आपातकालीन सहायता परियोजना (यू0ई0ए0पी0) के समयबद्ध एवं प्रभावपूर्ण क्रियान्वयन हेतु प्रशासनिक

Appendix E

PHOTOGRAPHS OF PUBLIC CONSULTATION

Appendix F

OPERATION CIRCULAR NO. 7/2013

GOVERNMENT OF INDIA
CIVIL AVIATION DEPARTMENT

OFFICE OF THE
DIRECTOR GENERAL OF CIVIL AVIATION
OPP. SAFDARJUNG AIRPORT, NEW DELHI – 110 003
TELEPHONE: +91-011-24635261
+91-011-24644768

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CENTENARY CELEBRATIONS CIVIL AVIATION INDIA

भारत सरकार
नागर विमानन विभाग
महानिदेशक नागर विमानन का कार्यालय
सफदरजंग एयरपोर्ट के सामने
नई दिल्ली - ११० ००३

Reference No.: संख्या : AV 22024/12/2013-FSD
Dated: दिनांक : 14th August, 2013

OPERATIONS CIRCULAR NO. 7/2013

Subject:- **UTILISATION OF HELICOPTERS IN DISASTER MANAGEMENT**

1. **Introduction**

1.1 During natural calamity / disaster, both aeroplanes and helicopters are requisitioned to provide aid by the **Requisitioning Authority (RA)**. Aeroplanes generally fly between two airports where all aviation related facilities and security exist. However Helicopters operate from the disaster sites and temporary/ unprepared helipads in a hostile environment. It is for this reason that this **'Operation Circular'** is specific to **'Utilisation of Helicopters in Disaster Management (DM)'**.

1.2 Helicopters have proved to be the most effective means of transportation, casualty evacuation, mass evacuation and means to provide 'relief' during a disaster, particularly in an inhospitable terrain and over hostile environment. This aspect was proved beyond doubt during the 2013 flash floods in Uttarakhand where almost eighty five (85) helicopters of Civil and Military registrations participated and were the only life-line in higher reaches of Himalayas. Helicopters with their ability to maneuver in restricted spaces, hover and act as an aerial platform saved almost 50,000 lives in Uttarakhand and were of immense help to the local administration and to the ground rescue parties.

1.3 The instructions given in this Circular are only a guideline to be followed by

RA/ State Govts, DGCA, Operators and other stake holders participating in DM. Each calamity/ disaster will have its own peculiarities and intensity and would require a specific response. What was applicable in Uttarakhand mountains during floods may not be applicable while providing aid and relief during an earthquake in the plains or other places.

2. Limitations of Helicopters

2.1 The RA and State Govts need to know the limitations of helicopters to be able to deploy them efficiently for best results for DM. The limitations of helicopters can be enumerated as follows:

a) Weather:
- Rain and Snow
- Visibility
- Turbulence
- Icing
- Strong and gusting winds.
  Thunderstorms.

b) Availability of landing spaces in hostile terrain/ environment.
c) Dusty and unprepared helipads.
d) Degradation of performance in high altitudes and in high temperatures.
e) Operations by 'Day' only.
f) Airspace management.
g) Number of helicopters available for the task as no dedicated helicopters are available for search and rescue, firefighting or winching, etc. under Civil registration.
h) Carrying capacity i.e. number of passengers and cargo, which depletes in high altitudes and in high temperatures conditions.
i) High maintenance vis-à-vis fixed wing aircrafts,
j) Pilot fatigue compounded by single pilot operations.

3. Helicopter Provisioning.

3.1 In addition to Civil registered helicopters, Indian Army, Indian Air Force, Indian Navy and Para-Military forces like BSF and CRPF also contribute their helicopter towards DM. Thus, DM site and area is a congregation of many 'Types' of helicopters, each with different characteristic and capabilities. Also, the rules governing flying operations for defence pilots and civil pilots are different. Therefore there is a need to integrate all operators participating in DM to be on one grid.

4. **Disasters in India.**

4.1 India is prone to numerous natural and man-made disasters, which could be :

a) Cloud burst, Floods and Landslides (Uttarakhand 2013, Assam 2012, Ladakh 2010 and Karnataka, Orissa, Kerala and Gujarat in 2009).

b) Earthquakes (Sikkim in 2009, J&K in 2007, Gujarat in 2000, Uttarakhand in 1999, Maharashtra in 1991 and HP in 1975)
c) Tsunami (A & N Islands, TN, AP and Orissa in 2004)
d) Cyclones (Orissa in1999, Gujarat in 2007, 2001 and 1998, Karnataka in 1993, Tamil Nadu in 2011, 2010, 2000, 1996 and 1993 and AP in 2007, 1998 and 1990)
e) Famines
f) Fires, both urban and jungle.
g) Manmade disasters like Bhopal Gas tragedy (1990), Rail accidents, terrorist attacks akin to 9/ 11 in the US, Radiations (Japan 2011), Building collapse and many more.

5. **Affects of Disasters on Flying Operations.**

5.1 Each disaster will affect flying activities and operations in a different manner but some common aspects are :

a) Break down of 'surface transport' affects logistic and aviation supply chain. Washing away of roads in Uttarakhand led to obstruction in transportation of fuel and logistics to forward helipads, leading to greater turnaround time and reduction in number of people evacuated.
b) Breakdown in telecommunications. It leads to lack of coordination between helicopter operators, between civil and defence/ para-military helicopters and between operators and State/ local administration.
c) Landslides, water logging, rubble, fire etc. result in non-availability of helipads to operate helicopters.
d) Restricted flying due to inclement weather (clouding and rain) and hostile environment reduces the window of opportunity to fly.
e) Lack of ground support near and over the disaster site.
f) Lack of control (aerial and on ground) in the disaster area.
g) Limited airspace on disaster site/ area and its availability to helicopters, since their number could be very large as in Uttarakhand

6. Tasking of Civil Helicopters

6.1 As the State Govts realize and recognize the potential of helicopters, it is likely that more and more helicopters will be sought in future for disasters and the main tasks assigned to helicopters would be:

a) Casualty evacuation.
b) Evacuate stranded people, particularly women, children, old and feeble, to safe places.
c) Search and rescue (SAR).
d) Carry rations, supplies and drinking water.
e) Medical aid.
f) Firefighting.
g) Carry large, voluminous and heavy loads like bridges, bulldozers, etc.
h) Aerial reconnaissance by decision makers.
i) In some case, carriage of dead bodies.
j) Relief and rehabilitation after the calamity.

7. Suggested Role and Responsibilities of RA / State Govts.

7.1 Without interfering in the DM scheme or in the functioning of State Govts, following guidelines are recommended for all Stake holders :

a) Include requisition and management of aviation assets as an integral part of DM scheme. State's Aviation department could be a part of DM Authority (DMA).
b) Ministry of Civil Aviation in their document 'Vision 2020' had suggested construction of a helipad in the vicinity of all large and populated habitats. State Govts may like to consider this aspect for implementation and construct helipads as per CAR Sec 4, Series 'B', Part 'V' which can be used by helicopters during normal times for ferrying passengers, tourists, VIPs and Govt. officials. During disaster/ calamity, they would serve as a hub/ launch pad for helicopters aiding DM.
c) Regular maintenance of State Govt. airports and helipads. In Uttarakhand, Gaucher airstrip had to be prepared before IAF aircraft could land on it.
d) Update 'Helipad directory' to include permanent and frequently used helipads, both Govt. and Private. State Govts. May provide such data to DGCA.

e) Encourage/ ease construction of helipads in their States and simplify helicopter movement procedures for their regular use.
f) Consider construction of roof top helipads over high rise buildings, particularly over those buildings frequented by general public in large numbers or with high density dwellings, for evacuation during fire. Some Indian cities have already made it mandatory for buildings above certain height to have roof top helipads.
g) Ensure all State Govt. aviation assets are serviceable. Helicopters of some State Govts are unserviceable for prolonged periods, some over three years.
h) Maintain a directory of all helicopters and aeroplanes in the State, which could be called upon for immediate relief during a disaster.
i) Update telephone directory of all Govt., Defence, Para-military and private operators in their State along with AAI and helipad operators.
j) Formulate procedures and modalities for requisitioning and chartering civil helicopters and aeroplanes during disaster.
k) During DM, the RA/ State Govt. would be required to ensure the following :
    - Provide security to all aviation assets.
    - Ensure one point contact with civil and defence operators for tasking aviation resources.
    - Draw priorities for tasking the sparse assets.
    - Smooth logistics support to keep machines flying.
    - Coordinate with DGCA, AAI, BCAS and Defence authorities to ensure coordination at all levels and uninterrupted flying operations.
    - Coordination with all stake holders and operators.
    - Ensure even handed policies to avoid misuse by unscrupulous elements.
    - Compile daily flying effort and results achieved.
    - Provide administration back-up to air and ground crew operating for DM.

7.2 State Govts would formulate a detailed working plan based on the above guidelines.

8. Role of DGCA

8.1 Since DGCA is a 'regulatory authority' and not part of NDMA or State DMA, its role is confined to ensuing Safety of aircraft operations and as a facilitator. Notwithstanding that, DGCA would provide all assistance to the RA/ State Govts to ensure quick response alongwith optimum and safe utilization of all aviation assets during DM. Some aspects which DGCA can facilitate are :

a) Smooth and quick mobilization of civil registered aviation resources to the site of disaster.

b) Advice State Aviation Cells to integrate aviation resources in their DM Scheme.

c) Provide Flight Operations Inspectors (FOIs) during the calamity to be collocated with State DMA and at site of disaster, to assist in the following :

- Interaction with State Government.
- Ensure optimum utilization of aviation resources and airspace management.
- Ensure safety of helicopter operations and flying during adverse conditions. Flight safety would be top priority at all times.
- Assist in preparation of landing grounds/ helipads.
- Logistic support to helicopters operating from forward helipads.
- Rest and relief of pilots, in coordination with operators.
- Proper maintenance of helicopters.
- Safety and security of helicopters, landing grounds, etc so that people do not crowd helicopters leading to inadvertent accident / incident.
- Proper briefing of pilots before take-off.
- Debriefing of pilots after the sortie.
- Priority of work
- Assist operators to get ATS clearances, if required.
- Provide SAR to IAF and Army, if required.
- Disseminating information to all operators and pilots about the following:
  - Weather in different valleys, routes and in different regions.
  - Conditions of existing helipads and landing grounds.
  - Security and aids available at various locations.
  - Movement of IAF and Army resources.
  - Location of ground / rescue parties.
  - Location of persons who need assistance.
  - Site of accident, if any, and relief to be rushed in.
  - VIP movement and restrictions, if any.

8.2 DDG-FSD will be the single point contact in DGCA Headquarters, when civil registered helicopters participate in DM. He/ she will be assisted by Senior most FOI(H) who will ensure mobilization of aviation assets, detailing FOIs to disaster site, mediating between operators and compiling daily reports.

9. Role of Operators.

9.1 It is expected that 'Operators' would rise to occasion during a calamity/ disaster and support the RA/ State Govt whole heartedly and scrupulously. Some of the tasks to be performed by Operators would be :

a) On specific instructions from the Ministry of Civil Aviation, 'Aid to State Govt. / RA' would be given 'Priority' over all other commercial activities. On requisition, move the helicopter(s) and ground party to the disaster site at the earliest by shortest route.

b) During DM :

- Undertake all flights within the realms of pilot's and helicopter's abilities, without jeopardizing safety.
- Ensure crew composition as per severity of weather, terrain, task, landing areas, security and safety concerns.
- Proper maintenance in field conditions.
- Rest and relief to air and ground crew.
- Work in coordination with other operators as per instructions of DGCA FOI delegated on site or co-opted with State DMA.
- Ensure FDTL compliance. DGCA may be approached to extend FDTL in exceptional cases.
- Seek DGCA assistance to utilize services of other operator's air and ground crew.
- Strictly follow rules for VFR and IFR flights.
- Provide assistance to other operators, if required.
- Provide assistance to IAF and Army, if required
- While tasking, give due consideration to pilot's :
  - Capabilities and clearances.
  - Emotional stability for evacuating casualties and dead bodies.
  - Single pilot ops capabilities in difficult terrain, over hostile areas and in inclement weather conditions.
- Ensure ethical conduct by all company personnel. Flying during DM is not an 'Opportunity' but an 'Aid'.
- Demobilize when released by RA/ State Govt.

9.2 As responsible entities, Operators need to further define their roles themselves during DM and ensure compliance.

9.3 Since a majority of pilots flying civil helicopters in India have military background, they would well be advised to draw a judicial and rational

balance between 'Flight safety' and 'Mission accomplishment'. Flight safety would remain of paramount importance and the pilots should :

a) Know capability and limitation of and their machines.
b) Stretch themselves and their machine only up to a certain limit and not beyond. It is always better to live another day to save more lives than take an irrational step in the heat of the moment.
c) Follow local SOPs, routings and other instructions meticulously. The airspace over the disaster area is shared by numerous helicopters and aircraft. Thus it is important to abide by clearances obtained and coordination done on ground before the sortie.

9.4 Lessons from Uttarakhand DM. During the floods in Uttarakhand, four (4) helicopters, three (3) civil and one (1) of IAF, and twenty (20) lives were lost due to avoidable accidents. Proper selection of helipad, adhering to security instructions, not flying in bad weather, not stretching the capabilities of the helicopter and proper hill training of the pilots would have ensured an accident free operation.

10. Helicopter Hubs/ Bases

10.1 Numerous helicopter bases may be required to be established in aid of a DM. FOI co-opted with State DM will ensure :

a) Distribution and movement of resources between different bases as per tasks envisaged.
b) Security of all bases.
c) Establishment of all maintenance and administrative facilities at all the bases.
d) Coordination with military helicopters.
e) Flight planning and its execution in coordination with other bases.
f) Adequate stocking and replenishment of FOL and other supplies in all bases.
g) Provide SAR in case of an air accident.

11. Reports and Returns

11.1 All operators will ensure the following:

a) Proper record of all sorties launched in aid of disaster management is maintained. It will consist of:
   - Number of sorties launched
   - Number of hours flown.
   - Numbers of passengers evacuated/air lifted.

- Load carried.
- Any special task undertaken.

b) Information will be given to FOI in the State DMA every day and to DGCA Hqrs. every 7th day on each Monday.

12. Conclusion

12.1 Above instructions are not exhaustive and would require modification and interpretation by the FOIs co-opted with State Govts and by the State DMA as per ground realities and degree / intensity of disaster.

12.2 All Operators should carry out the assigned tasks to the best of their ability within the realms of "Flight Safety" and also within human, machine and weather limitations.

Sd/-
(Lalit Gupta)
Deputy Director General
for Director General of Civil Aviation

Appendix G

NO-OBJECTION CERTIFICATES (NOCs)

प्रेषक,

जिलाधिकारी,
पिथौरागढ़।

सेवा में,

कार्यक्रम निदेशक,
यू.ई.ए.पी., उत्तराखण्ड
सिडकुल बिल्डिंग 29 II आई.टी.पार्क,
सहस्त्रधारा रोड देहरादून।

संख्या- [illegible] /[illegible]/2014-15 दिनांक [illegible] 15, 2014

विषय- [illegible]

महोदय,

उपर्युक्त विषयक अपने पत्र संख्या-112/यू.ई.ए.पी./2014 दिनांक 25.08.2014 का सन्दर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा जनपद पिथौरागढ़ अन्तर्गत विभिन्न स्थानों पर हैलीपैड/हैलीपोर्ट/हैलीड्रम का निर्माण किये जाने हेतु अनापत्ति उपलब्ध कराये जाने की अपेक्षा की गयी है।

इस सम्बन्ध में तहसीलदार मुनस्यारी की आख्या/संस्तुति अनुसार ग्राम मिलम में हैलीपैड विस्तारीकरण हेतु प्रस्तावित 2500 वर्ग मीटर रकबा भूमि जो [illegible] के नाम दर्ज है, को हैलीपैड विस्तारीकरण हेतु उपयोग करने में कोई आपत्ति नहीं है, तदनुसार [illegible] अग्रिम आवश्यक कार्यवाही हेतु प्रेषित है।

भवदीय,

(सुशील कुमार)
जिलाधिकारी पिथौरागढ़।