

Initial Environmental Examination

Project Number: 49108-002
September 2019

India: Himachal Pradesh Skill Development Project Sub-projects – Center of Excellence at Waknaghat in Solan District

Prepared by the Government of Himachal Pradesh for the Asian Development Bank

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ABBREVIATIONS

ADB	-	Asian Development Bank
ASI	-	Archaeological Survey of India
COE	-	Center of Excellence
CPCB	-	Central Pollution Control Board
CLC	-	City Livelihood Centre
CPR	-	Common property resources
DOLE	-	Department of Labor and Employment
DOTE	-	Department of Technical Education, Vocational and Industrial Training
DOP	-	Department of Planning
DOT	-	Department of Tourism
EA	-	Executive Agency
DOUD	-	Department of Urban Development
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
FSI	-	Forest Survey of India
GOHP	-	Government of Himachal Pradesh
GOI	-	Government of India
HPSDP	-	Himachal Pradesh Skill Development Project
IEE	-	Initial Environmental Examination
IA	-	Implementing Agency
ITI	-	Industrial Training Institute
IUCN	-	International Union for Conservation of Nature
MOEFCC	-	Ministry of Environment, Forests and Climate Change
MCC	-	Model Career Center
NP	-	National Park
OM	-	Operations Manual
PA	-	Protected area
PD	-	Project director
PIU	-	Project Implementation Unit
PMC	-	Project Management Consultant
PMU	-	Project Management Unit
PUC	-	Pollution under Control
PWD	-	Public Works Department
RLC	-	Rural Livelihood Centre
REA	-	Rapid Environmental Assessment
SEIAA	-	State Environment Impact Assessment Authority
SLEC	-	State-level Empowered Committee
SPCB	-	State Pollution Control Board
SPM	-	Suspended Particulate Matter
SPS	-	Safeguard Policy Statement 2009
UNESCO	-	United Nations Educational Scientific and Cultural Organization
WLS	-	Wildlife Sanctuary

CURRENCY EQUIVALENTS

(As of 03 September 2019)
Currency unit – Indian rupee (Rs)
Rs1.00 = \$0.0140845
\$1.00 = Rs 71.00

WEIGHTS AND MEASURES

dB(A) A-weighted decibel
ha - hectare
km- kilometer
km²-square kilometer
µg- microgram
m - Meter
m² - square meter
MW (megawatt) - megawatt

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EXECUTIVE SUMMARY

1. At the request of the Government of India and the Government of Himachal Pradesh (GOHP), ADB will offer \$80 million in loan assistance to modernize and reform Himachal Pradesh's technical and vocational education and training (TVET) programs, and scale up training capacity. The Department of Technical Education (DOTE), GOHP, will be the executing agency for the proposed Himachal Pradesh Skill Development Project (HPSDP). The Himachal Pradesh *Kaushal Vikas Nigam* (HPKVN), the Department of Technical Education, Vocational & Industrial Training (DTE), Department of Higher Education (DOHE), and the Public Works Department (PWD) will be the implementing agencies. HPKVN will also operate as the project management unit (PMU) for HPSDP. For the civil works component, it will be assisted by PWD officials who are well aware of the state and India's building codes and environmental regulations.

2. The impact of HPSDP will be a more productive work force in Himachal Pradesh equipped with market-relevant technical and vocational skills created, in alignment with the Himachal Pradesh Skill Development Policy (*Him Kaushal*), 2016. The outcome will be improved employment and livelihood development opportunities for those trained under the project. This will be achieved through the following outputs:

- Output 1: TVET in Himachal Pradesh modernized, expanded, and aligned to national standards
- Output 2: Market-aligned skills ecosystem created
- Output 3: Access to quality training institutes improved.
- Output 4: TVET institutional structure reformed and improved.

3. Output 3 of the Project will involve construction of new training facilities and upgrading of some existing buildings to improve the access of TVET programs across Himachal Pradesh.¹The new facilities include construction of 6 city livelihood centers (CLCs), 7 rural livelihood centers (RLCs), and 1 Polytechnic for women. Eleven employment exchanges will be upgraded into model career centers (MCCs). In addition to above infrastructure components, one Center of Excellence (COE) is also planned near Waknaghat town in Solan district. This COE shall impart Training programs of higher levels in hospitality, Information Technology and other areas of industry demand. On average, the CLCs and RLCs will have 3 to 4 floors, and occupy about 900 m². The MCCs will have 3 to 4 floors on average, and occupy around 400 m² each. The built up area of COE is 12560 m². **The Department of Urban Development (DOUD), Department of Rural Development(DORD), and the Department of Labor and Employment(DOLE) will help HPKVN in running livelihood development and counseling programs at the proposed CLCs, RLCs, and MCCs respectively. The operations of COE will directly rest with HPKVN management.**

4. GOHP has assured ADB that the proposed new infrastructure will be built, either within premises owned by the government, or on vacant and unencumbered land owned by the government. No new land will be acquired, nor will anyone be displaced in anticipation of ADB funding. Sites located within or near environmentally-sensitive areas and tribal areas of Himachal Pradesh will not be considered. No project related activity will have any adverse impact on indigenous peoples or impede their cultural and human rights. Hence, from a safeguards perspective, the HPSDP Project is categorized as 'B' for environment, 'C' for involuntary resettlement, and 'C' for indigenous peoples. The proposed project

¹A detailed Environmental and Social Management Framework (ESMF) has been prepared in line with ADB's Safeguards Policy Statement (SPS), 2009, to guide the executing agency and implementing agencies in mainstreaming environmental and social concerns into the design and implementation phases of HPSDP.

categorization has been reconfirmed by an experienced ADB environment and social safeguards consultant, who visited all sites finalized so far.² Individually for the proposed COE sub-project also, categories remain the same as mentioned for HPSPDP for environment, involuntary resettlement and indigenous peoples.

5. The proposed COE site is near Wagnaghat town of Solan district. This COE is planned on unencumbered land owned by GOHP. This COE will provide, the needy urban youth of Himachal Pradesh, advanced skill development opportunities for gainful employment. The COE building will be a four floor building including ground, first, second and third floor with a total built up area of 12560 m². The first floor will also have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The second floor will have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The third floor will have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The Hotel and Hotel management Institute are planned to provide training on hospitality as State is a popular tourist destination. Septic tanks will be provided for about 1000 persons capacity. Solar panels will be installed on the roof. They will have the potential to generate a minimum of 20kVA of power at each location. The total electricity load has been estimated as 100 kW. Water consumption has been estimated as 200,000 liters per day. Water source will be from the PHED supply. The solid waste generated will be integrated with the waste disposal system at Wagnaghat.

6. The architectural expression of the COE building is in harmony with the local style of Himachal Pradesh - suitable for cool weather, with a long rainy season, and light snowfall. The building aims to evoke a learning-friendly atmosphere which will attract the trainees. The COE will be barrier-free. There will be ramps and specially designed toilets to make it easy for people with disabilities. The COE building will have adequate number of modern sanitation and drinking water facilities. Concrete gutters at the end of steel sheeting roofs will direct the rain water to underground rain water harvesting tanks. The clean rainwater runoff can be re used for horticultural purposes and recharging the ground water.

7. The proposal includes for the provision of solar power panels at COE roof top for which a budget of \$60,000 has been allocated. The system is expected to generate about 20 KVA which will meet the COE demand for lighting and running the computer laboratories. Any waste generated on account of operation and maintenance of solar PV Cell will be taken up by the supplier, who will also be maintaining the PV cell, for possible recycle and reuse.

8. The enclosed **initial environment examination (IEE) report** provides details about the COE site, the potential environmental impact of the civil works, and suggests ways of mitigating and addressing these.³ Since the COE site is close to Wagnaghat town and Majhol village, therefore there is no existence of any protected, reserved or revenue forest areas nearby. There is no natural stream or river near the sub-project site. The COE site is on undulating terrain. There are no protected areas (national parks, bird sanctuaries, tiger

²In addition to the Environment and Social Safeguards consultant, other experts including an Architect, a Labor Economist / Gender specialist) plus relevant consultants from the consulting firm engaged under the project preparatory technical assistance project (IND TA 8760), have also screened these sites.

³Local stakeholders were involved in developing the IEE through discussions on-site and public consultation. Their views were incorporated into the IEE, and the design of the sub-project. The IEE will be made available at public locations in the town such as Municipal office building, district administration office. It will be disclosed to a wider audience via the ADB, DOUD, and HPKVN websites.

reserves, etc.), wetlands, mangroves, or estuaries in or near the sub-project location (within 15 km aerial distance). Therefore, there are no ambient air quality and noise level issues.

9. Since the COE building will be for vocational training and livelihood development, construction of COE building and its operations are unlikely to cause any significant impacts. These routine and localized effects associated with construction and operation of the new building can be mitigated easily by following the measures laid down in the Environment **Management Plans (EMP) included** in the IEE. The EMP will be included in civil works bidding and contract documents. **The IEE confirms that COE Wagnaghat sub-project is of environment category “B” as per ADB SPS 2009 categorization.** No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS, 2009 or Government of India EIA Notification, 2006.

10. HPKVN and PWD will be responsible for overall planning and implementation of the civil works. They will ensure that the ESMF is followed during sub-project implementation. The Project Management Consultants (PMC) engaged under the loan has experienced Environment and Social Safeguards specialists. They will assist HPKVN and PWD in supervising the civil works of COE as well as implementation of EMP of COE.

I. INTRODUCTION

A. Background

1. **Location.** The subproject comprises of establishment of Center of Excellence (COE) at Waknaghat in Solan district. The COE site is located near Majhol village. The site is about 6 km from Solan- Shimla highway. The latitude and longitude of the COE site are given below:

Sl. No.	Name of Facility	Latitude	Longitude
1	COE at Waknaghat	30°59'56.4"N	77°03'56.9"E

2. The nearest rail head at Kaithleeghat is 9.5 km away from COE site. The Waknaghat town city is well connected with important destinations such as Shimla, Chandigarh and Delhi. The distances of important destinations is given below:

Sl. No.	Subproject Location	Altitude (m)	District	Distance from site (km)
1.	COE Waknaghat	1370	Solan	Solan : 26 km Kandaghat : 11 km Shimla Airport : 35 km Chandigarh Airport : 104 km Mandi : 145 km New Delhi : 339 km Shimla : 28 km Ambala : 125km

3. The COE site is owned by Department of Technical Education (DOTE). The Solan district lies between the parallels of 30°44'53" to 31°22'01"North and 76°36'10" to 77°15'14" East.

4. **Present Status of Site.** The subproject site is undulating and exists in an open area. There are no permanent or temporary structures on the site. There are also no trees or vegetation also. The photographs of sub-project site are shown below **Figure-1**.

Figure-1: Photographs of Sub-project Site



General View of Subproject Site



View of COE Site showing Undulating Nature



View of Site Showing No Trees Presence



View of Site Showing Presence of Small Shrubs

B. Compliance with India's Environmental Regulatory Framework

5. India's environmental rules and regulations, as relevant for the COE are shown in **Table 1**. The Environmental Impact Assessment (EIA) notification, 2006 by the Ministry of Environment, Forests and Climate Change (MOEFCC, GOI) specifies the requirements for mandatory environmental clearances. All projects and activities are broadly categorized into two categories—category 'A' and category 'B', based on the spatial extent of potential impacts on the environment, human health, and natural and man-made resources⁴. However, MOEFCC's Office Memorandum (F. No. 19-2/2013-IA- III), dated June 09, 2015, and exempts all educational and training institutes from obtaining prior environmental clearance. Since all the training facilities to be constructed or upgraded under HPSPDP, including COE Wagnaghat, are meant for educational and training purposes, they will not require any prior environmental clearances according to the environmental rules and

⁴ All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the Central Government in the Ministry of Environment, Forests and Climate Change (MoEFCC) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification; All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In addition, General Condition (GC) of the notification specifies that any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 5 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries

regulations of India. Further, as shown in **Table 1**, most other rules pertaining to India's regulatory framework such as Ancient Monuments and Archaeological Sites and Remains Act, 1958; the Wildlife (Conservation) Act, 1972, amended in 2003 and 2006; and the Forest (Conservation) Act, 1980, will also not apply to COE subproject. Only some permission will be required from the Himachal Pradesh State Pollution Control Board for the construction phase of the sub-project.

Table-1: Environmental Regulatory Compliance

Sub-Project	Applicability of Acts/Guidelines	Compliance Criteria
Construction of COE at Wagnaghat in Solan district	The EIA notification, 2006 (and its subsequent amendments till date) provides for categorization of projects into category 'A' and 'B', based on extent of impacts.	The sub-project is not covered in the ambit of the EIA notification (amended till date), either as a Category 'A' or Category 'B' project. As per the Office Memorandum dated June 09, 2015 of MOEFCC, educational and training institutions are exempted from prior environmental clearance. As a result, the categorization, and the subsequent environmental assessment and clearance requirements, either from the state or the GOI, are not triggered. Not Applicable
	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.	The COE Wagnaghat site is not close to any monument which is protected by the Archaeological Survey of India (ASI). Hence, no clearance is needed from ASI. Not Applicable
	Water (Prevention and control of pollution) Act, 1974 and Air (prevention and control of pollution) Act, 1981	Consent for Establishment (CFE) and Consent for Operation (CFO) from the State Pollution Control Board will be required during construction for installation of diesel generator set, hot mix plant, and concrete batching plant. For the operation phase, no CFO will be required. Applicable only for Construction Phase
	The Wildlife Conservation Act, 1972, amended in 2003 and 2006, provides for protection and management of Protected Areas.	No wildlife protected areas within 15 km aerial distance from the COE site. Not Applicable
	Forest (Conservation) Act, 1980	This act provides guidelines for conservation of forests and diversion of forest land for non-forest use. It describes the penalties for contravention of the provisions of the Act. If

Sub-Project	Applicability of Acts/Guidelines	Compliance Criteria
		forest land has to be acquired for the project, clearance is required from the Forest Department. No forest land is required for COE site. Hence, this is not applicable. Not Applicable

C. Asian Development Bank's Environmental Safeguard Policy Principles

6. Since the proposed HPSPDP is being funded by the ADB, it has to comply with ADB's SPS, 2009, in addition to the India's own environmental laws and regulations. The environmental safeguard policy principles embodied in SPS, 2009 aim to avoid adverse impacts on the environment and on affected people or communities; minimize, mitigate and/or compensate for adverse project impacts, if unavoidable; help borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks. The SPS, 2009 categorizes all projects into 3 environmental categories (A, B or C) based on their potential impacts⁵. ADB's REA checklist method was followed to assess the potential impact of the proposed COE sub-project (**Annexure-1**). As explained below, the subproject has been categorized as 'B'. Accordingly, this IEE has been prepared to address the potential impacts in line with the requirements for category 'B' project. The IEE is based mainly on baseline data generation on environmental parameters and secondary sources of information and field reconnaissance surveys. Stakeholder consultations at the subproject site are an integral part of the IEE. An Environmental management plan (EMP) outlining the specific environmental measures to be adhered to during implementation of the sub-project is included in the IEE.

D. Review and Approval Procedure

7. For Category 'B' projects, the draft environmental status report is reviewed by the relevant ADB Departments and the Executing Agency. Additional comments are incorporated into the final documents as relevant. These are reviewed by the Executive Agency and ADB safeguards team. The Executing Agency then officially submits the IEE report to ADB for consideration by the ADB Management. The final report is made available worldwide by ADB, via the depository library system and the ADB website.

E. Report Structure

8. This Report contains eight sections including this introductory section: (i) Introduction; (ii) description of sub-project components; (iii) description of the existing

⁵ As per SPS 2009, projects are assigned to one of the following four categories: (i) **Category A**. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required. (ii) **Category B**. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category a projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category a projects. An initial environmental examination is required. (iii) **Category C**. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed (iv) **Category FI**. A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI (paras. 65-67).

environment around the sub-project; (iv) environmental impact and mitigation measures; (v) EMP; (vi) Public Consultation and information disclosure; (vii) findings and recommendations; and (viii) conclusions.

II. DESCRIPTION OF THE PROJECT COMPONENTS

A. Components of the Sub-project

9. The location of the sub-project site and surroundings are shown in **Figures 2 and 3**. **Table -2** summarizes the need for the sub-project, and is proposed components.

Figure-2: Location of COE Site at Wagnaghat

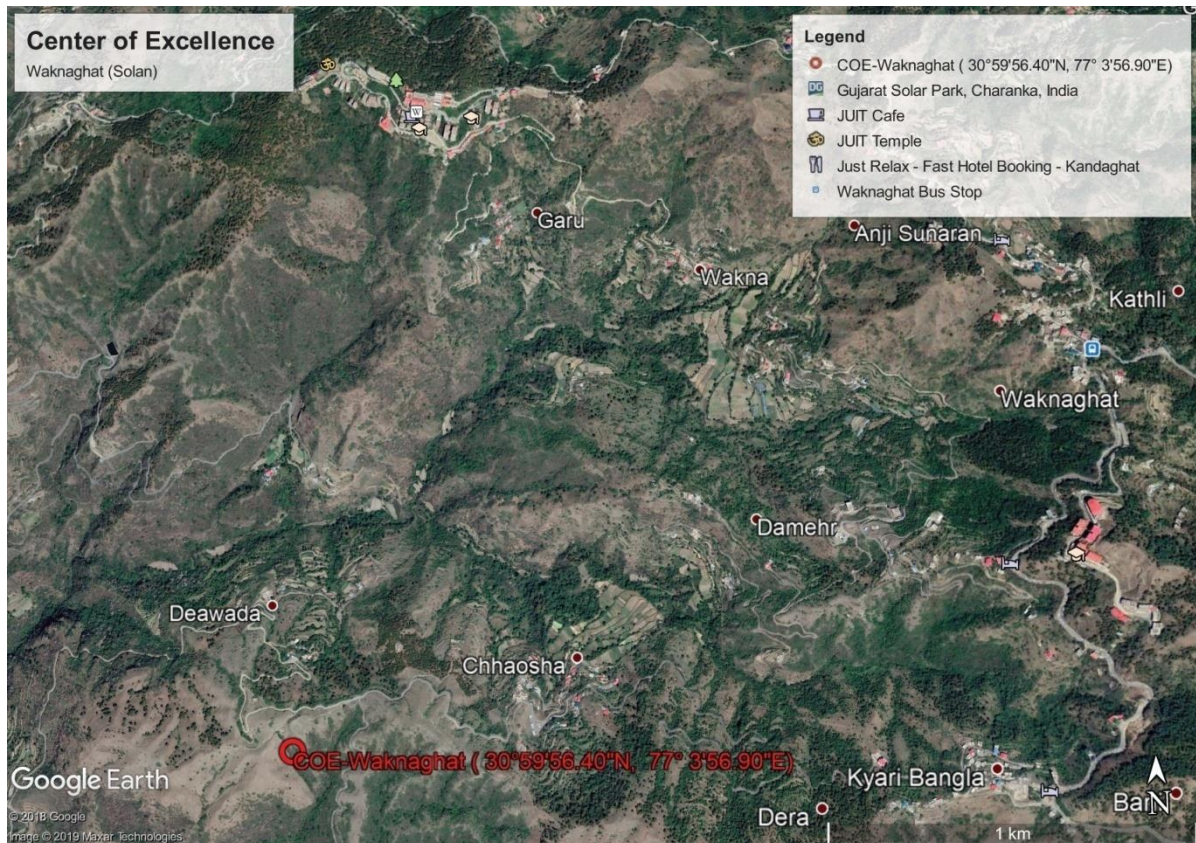


Figure-3: Location of COE Sub Project Site

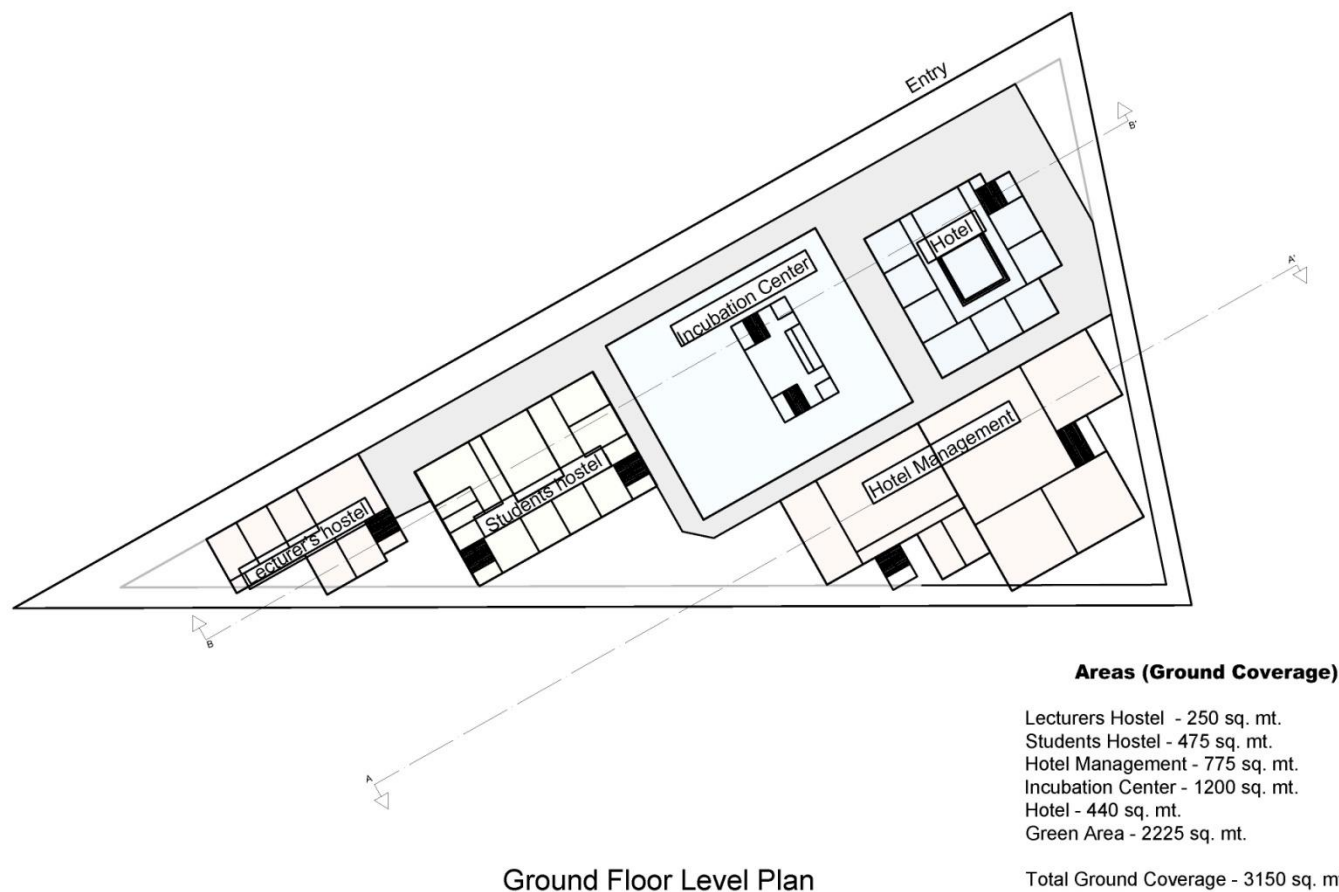


Table-2: Description of the Sub-project Components

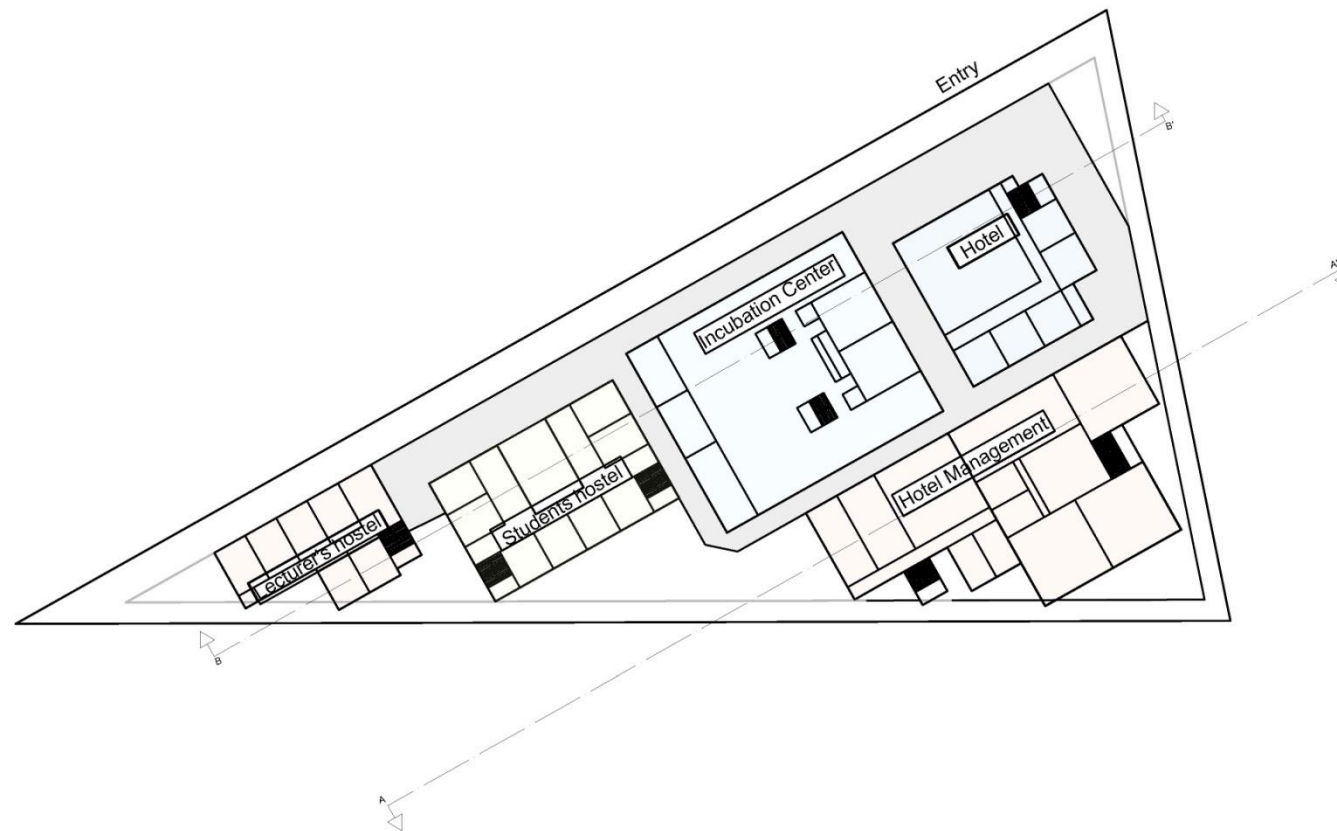
Description	Need of the Project	Proposed Components
COE at Wagnaghat	<ul style="list-style-type: none"> Himachal Pradesh lacks the required number of good quality facilities for imparting technical and vocational education training (TVET) to the <i>Himachali</i> youth. The proposed COE at Wagnaghat will provide the needy urban youth of the State with advanced and good quality skills training and livelihood development opportunities. The hostel facilities will enable out-station trainees from small towns and remote villages to enroll for residential programs at the COE 	<p>The main sub-project components include:</p> <ol style="list-style-type: none"> The COE Wagnaghat will have a four storey building for accommodating training facilities. The ground floor will have Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute, and Students' Hostel. The first floor will also have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The second floor will have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The third floor will have another floor of Lecturer's Hostel, Incubation Center, Hotel, Hotel Management Institute and Student's Hostel. The Hotel and Hotel management Institute are planned to provide training on hospitality as State is a popular tourist destination. Total built up area on all floors is expected around 12,560 m². Septic tanks will be provided for about 1000 persons. Solar panels will be installed on the roof. They will have the potential to generate a minimum of 20kVA of power at each location. The total electricity load has been estimated as 100 kW. Water consumption has been estimated as 200,000 liters per day. Water source will be from the PHED supply. The solid waste generated will be integrated with the waste disposal system at Wagnaghat.

10. The layout plan of COE Wagnaghat is shown below in **Figure-4**.

Figure-4: Layout Plan of COE Wagnaghat
I.T. SKILL DEVELOPMENT CENTER

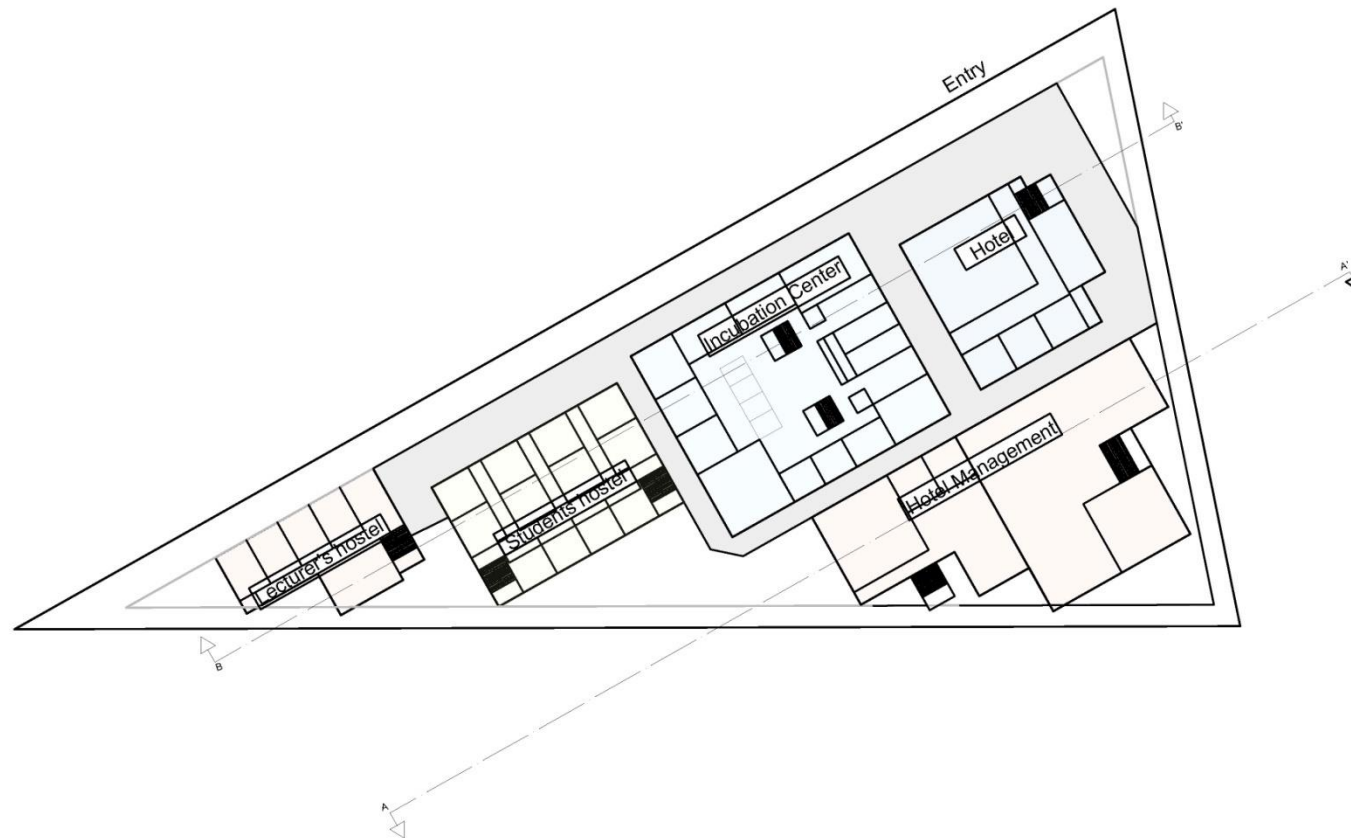


I.T. SKILL DEVELOPMENT CENTER



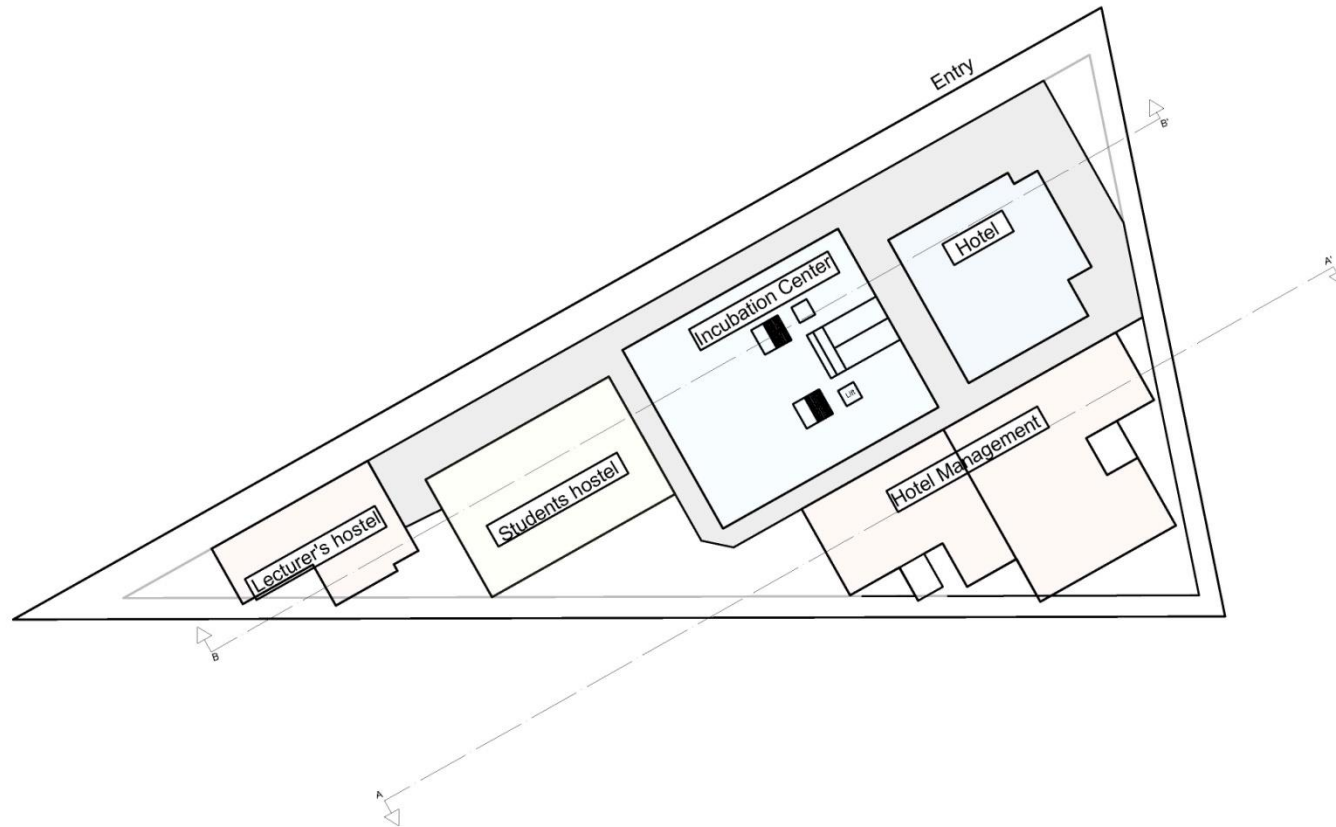
First Floor Level Plan

I.T. SKILL DEVELOPMENT CENTER



Second Floor Level Plan

I.T. SKILL DEVELOPMENT CENTER



Third Floor Level Plan

B. Executing and Implementing Agencies

11. The Department of Technical Education (DOTE), GOHP, will be the executing agency for the proposed HPSPD. The *Himachal Pradesh Kaushal Vikas Nigam* (HPKVN), the Department of Technical Education, Vocational & Industrial Training (DTE), Department of Higher Education (DOHE), and the Public Works Department (PWD) will be the implementing agencies. HPKVN will also operate as the project management unit (PMU) for the overall project. For the civil works component, it will be assisted by PWD officials who are well aware of the states and India's building codes and environmental rules and regulations. HPKVN and PWD will be responsible for overall planning and implementation of the civil works. They will ensure that the ESMF is adhered to during project implementation. The Project Management consultants (PMC) engaged, under the loan, have experienced Environment and Social Safeguards specialists. They assist PWD and HPKVN in supervising the civil works, ensuring that the IEEs and EMPs are prepared for all sub-projects, and also in preparing semi-annual safeguards monitoring reports. HPKVN will consolidate the semi-annual reports, and submit them to ADB. ADB will post the environmental monitoring reports on its website.

C. Implementation Schedule

12. The implementation period for the COE sub-project is 24 months. The preliminary drawings for COE have been prepared for approval and these have been approved. The bidding process for the sub-project will be started by October 2019. The sub-project will be awarded for construction by December 2019. The contractor is expected to be mobilized to site by January 2020 and construction works of sub-project will begin in January /February 2020 and work will be completed by February 2022.

III. DESCRIPTION OF THE EXISTING SUB-PROJECT ENVIRONMENT

13. This section presents a brief description of the existing environment around the sub-project site including its physical resources, ecological resources, socio-economic development and social and cultural resources. Broad aspects on various environmental parameters such as geography, climate and meteorology, physiographic, geology, seismology, ecology, socio-cultural and economic development parameters that are likely to be affected by the proposed sub-project are presented in this section. Secondary information was collected from relevant government agencies like the Forest Department, State Environment Department, and State Pollution Control Board, and Meteorological Department.

A. Environmental Profile

Air and Noise Quality

14. No air pollution sources have been seen in the surroundings of COE site as this is located in an open rural area. The subproject site is not close to any national highway or state highway (about 6 km from NH-22). There are no industrial emissions in the surroundings of COE site. In order to record baseline ambient air quality, data published in past EIA studies have been referred. Wagnaghat and Solan are not on ambient air quality monitoring network of Himachal Pradesh Pollution Control Board and Central Pollution Control Board. The data for ambient air quality has been given in **Table-3**. It is clear from the table that ambient air quality is well within the limits in respect of all ambient air quality parameters. At sub-project site AAQ is expected to be better than Solan and Soghi as site is in an open rural area.

Table-3: Ambient Air Quality Data for Sub-project area

Sl. No.	Location	Range of Measured Concentration					Distance from Sub-project Site
		SO2	NOx	PM10	PM2.5	CO (mg/m3)	
		All units in µg/m3					
1	Solan	8-11	13-18	31-43	8-14	0.4-0.9	26 km
2	Shoghi	BDL *-10	13-17	32-40	8-12	0.5-0.9	15 km
Applicable Ambient Air Quality Standards		80	80	100	60	4.0	
Source: Environmental Impact Assessment Study of 4/6 Laning of Solan- Shimla section on NH-22 (Year 2012)							
* Below Detection Limit							

Table-4: Ambient Noise Levels in Project Area

Sl. No.	Location	Leq dB(A) Day	Leq dB(A) Night	Limits in Leq dB(A)	
				Day Time	Night Time
1	Solan	62	52	65	55
2	Shoghi	52	43	55	45
Source: Environmental Impact Assessment Study of 4/6 Laning of Solan- Shimla section on NH-22 (Year 2012)					

15. Noise levels data is not available for the sub project site. The data for this has also

been referred for the nearest locations through published sources. This data has been given in **Table-4** above. It is clear from this table that values are well within the stipulated limits. At subproject site also, the noise levels are expected to be well within the stipulated limits as there are no noise generating activities.

16. In order to have site specific Ambient air quality monitoring and noise levels data, monitoring will be conducted by the contractor prior to start of construction works with the aim of establishing baseline conditions.

17. **Climate.** The climate of the district is sub-tropical in the valley and tends to be temperate on the hilltops. There are four major seasons. The winter season commences from November to February and ends in March; summer season extends from March to June, followed by the monsoon period extending from July to September.

18. Maximum precipitation occurs during July to September. Average annual rainfall in the district is about 1340 mm, out of which 85% rainfall occurs during June to September. In the winter season, precipitation as snowfall also occurs in the higher reaches up to 1000 m elevation and as rainfall in low hills and valleys of the district.

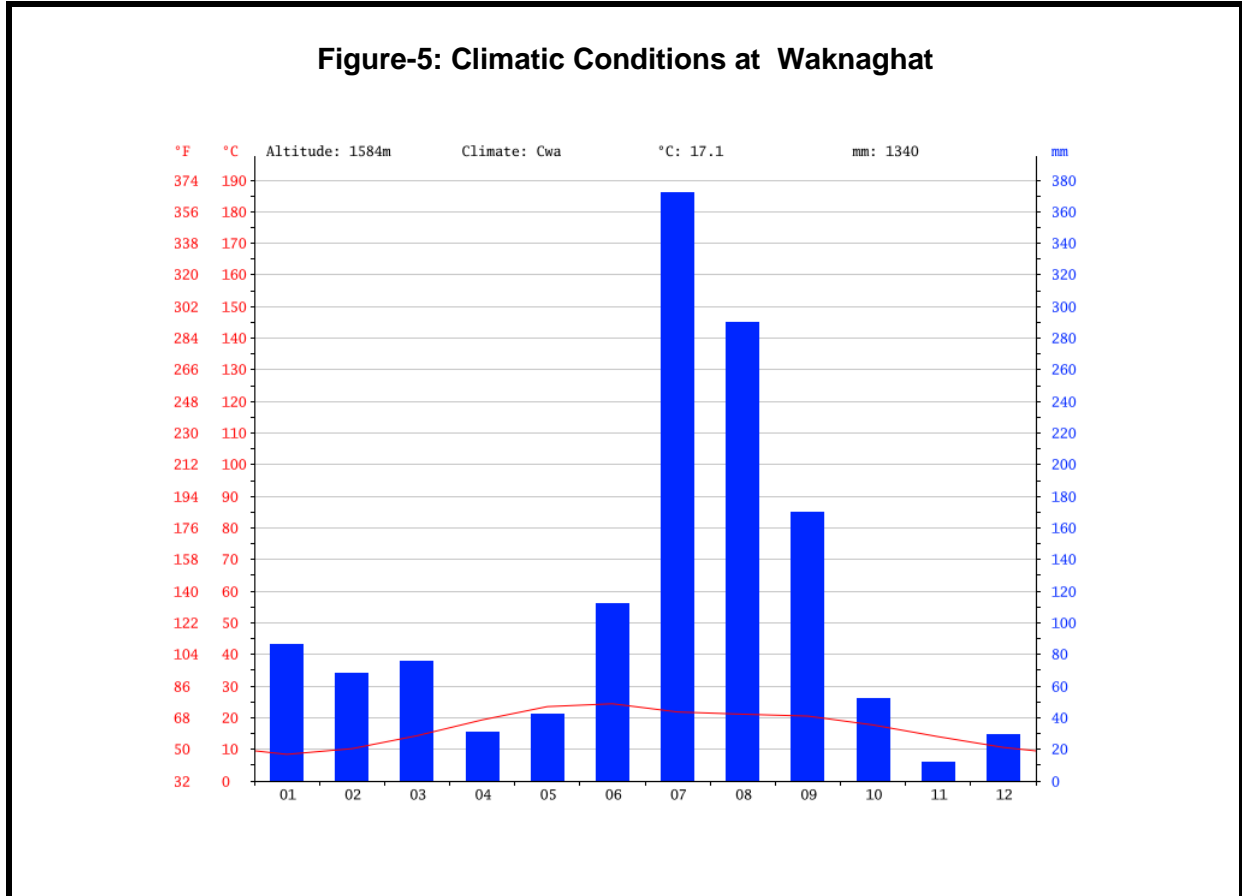
19. The **Table-5** below shows month wise weather conditions at Wagnaghat.

Table-5: Climatic Conditions at Wagnaghat

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature (°C)	8.4	10.2	14.3	19.3	23.5	24.4	21.8	21.1	20.5	17.7	14	10.6
Minimum Temperature (°C)	4	5.6	9.4	14	18.2	19.7	18.8	18.3	17	13.1	8.9	5.8
Maximum Temperature (°C)	12.8	14.9	19.3	24.6	28.8	29.1	24.9	23.9	24.1	22.4	19.2	15.4
Average rainfall /Precipitation (mm)	86	68	76	31	42	112	372	290	170	52	12	29

Source: <https://images.climate-data.org/location/1012419/climate-graph.png?ezimgfmt=ng:webp/ngcb1> (Year 2018)

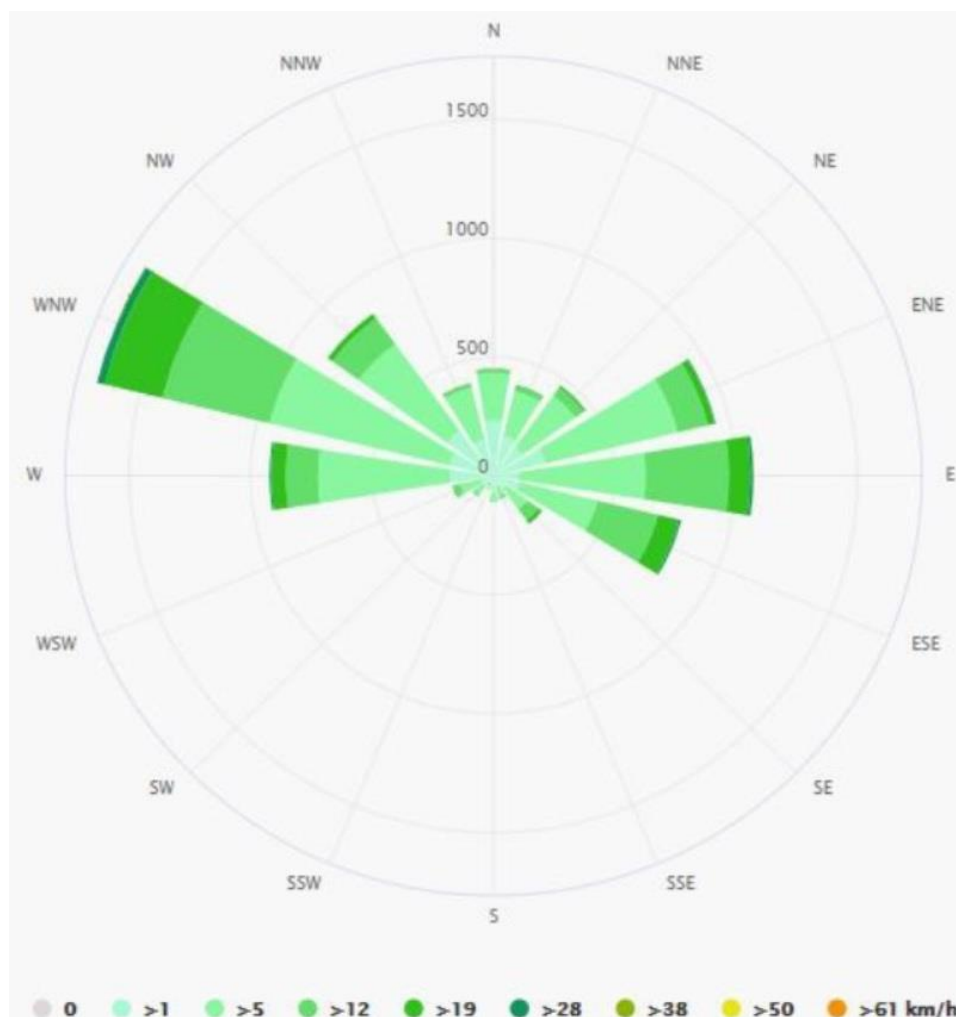
20. **Rainfall.** As mentioned earlier, sub-project area experiences maximum rainfall during monsoon season from June to September while as least Rainfall is received in November and April months. There is occasional snowfall at Wagnaghat. Annual average rainfall is around 1340 mm. The climatic conditions for Wagnaghat have been depicted in **Figure-5** below:



21. **Humidity.** Based on long-term climatologically data of the Solan district, it is found that relative humidity increases rapidly with the onset of monsoon and reaches maximum (around 85% in the morning and 84% in the evening) during August, when peak monsoon period sets in. Relative humidity is the minimum during the summer months (from April to June) with May being the driest month (40% in morning and 33% in evening). Skies are heavily clouded during the monsoon months and for short spells when the project area is affected by Western Disturbances.

22. **Wind Speed and Directions.** Generally, light to moderate winds prevail throughout the year with speed ranging from 1 to 19 kmph. Winds were light and moderate particularly during the morning hours, while during the afternoon hours the winds were stronger. The annual wind rose diagram based on IMD long term data for Shimla has been given below in **Figure-6**. It is clear from these wind rose diagrams that most predominant wind direction is WNW in the morning followed by E. The most predominant wind speed range in project area is 1-5 kmph. Calm conditions (wind speed <1 kmph) prevail in morning and night hours.

Figure-6: Annual Wind Rose Diagram for Sub-project Region



Topography and Soils

23. Solan district presents an intricate mosaic of high mountain ranges, hills and valleys with altitude ranging from 300 to 3000 m above msl. The altitude of the hill ranges is higher in northern parts, whereas south-western part of the district is represented by low denuded hill ranges of Siwalik. In the areas underlain by high hill ranges of Himalayas, the valleys are narrow and deep with steep slopes trending in NW-SE direction. The terrain is moderate to highly dissected with steep slopes.

24. Soil is generally sandy loam in valley areas of the district and in rest of the hilly and mountainous areas, soil is skeletal. Soil depth is generally shallow, except in areas having good vegetative cover. It is generally dry, shallow and deficient in organic matter. Landslides are the common features in mountainous terrain. Soils are rich in nutrients and thus are fertile.

25. Depth of the soil varies from 50 to 100 cm. But despite this, all the agro climatic conditions provide a range of potentialities for growing cash crops like, off season vegetables, seed potatoes, pulses and temperate fruits.

Surface water and Ground water

26. The COE site at Waknaghat is in Satluj River catchment. The Satluj tributary Gambhar Khadd is at about 3 km distance from subproject site. To establish baseline scenario, ground water quality data was obtained from the Central Ground Water Board. The water quality data for the sub-project district is given below in **Table-6**.

Table-6: Ground Water quality in Sub-Project Area for Solan District

Parameter	pH	EC μS/cm at 25°C	Cl	NO3	F	Ca	Mg	Na	K	Total Hardness as CaCO3
Unit - mg/l										
Min	7.50	320	14	5.4	0.11	16	9.5	25	1	20
Max	8.10	1100	264	107	0.33	55	29	138	6	208
Drinking Water Quality Standards	6.5- 8.5	No limit specified	1000	45	1.5	200	100	No limit specified	No limit specified	600

Source: Central Ground Water Board.

27. Due to the absence of any water polluting sources in the sub project sites and surroundings, it is clear that all parameters, except nitrate, are within the permissible limits, specified by Bureau of Standards (BIS), for drinking and irrigation. The water quality monitoring will be conducted by the contractor prior to the start of construction works. The maps showing hydrogeology of Solan district has been given in **Figure -7**.

28. Ground water occurs under phreatic and confined conditions. Wells and tube wells are the main ground water abstraction structures. Ground water is being developed in the area by medium to deep tube wells, dug wells, dug-cum bored wells. Depth of open dug wells and dug-cum bored well in the area ranges from 4.00 to 60.00 m bgl, wherein depth to water level varies from near ground surface to more than 35 m bgl. Yield of shallow aquifer is moderate, with well discharges upto 10 lps. Out of the 16 exploratory wells, CGWB has drilled/constructed 14 exploratory wells in the valley area, in the depth range of 65.00 to 300.00 m bgl. Static water level ranges from 2.2 to 43.20 mbgl, discharge ranges from 1.44 to 1968 lpm, for a draw-down of 2.48 to 24.10 m. The stage of ground water development is 52% and falls under safe category. This signifies that water can be extracted from ground for the needs.

29. Since Satluj is the major river of significance in the subproject region so water quality data of this river was collected from secondary sources. This data has been given below in **Table-7**. It is clear that River water parameters are well within stipulated standards for drinking water quality.

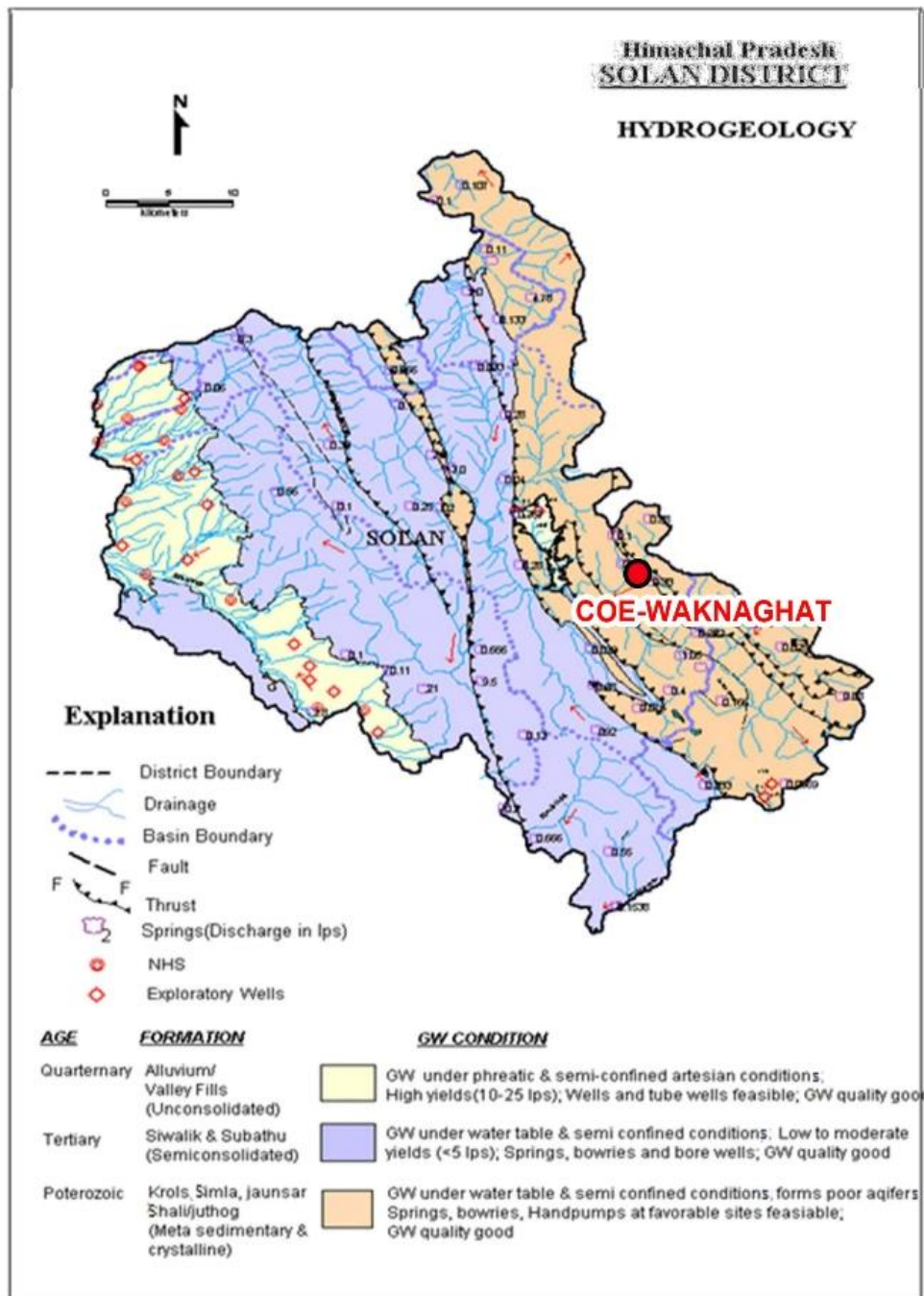
Table-4: Satluj River Water quality in Sub-Project Region

Sl. No.	Parameter	Unit	Value	Permissible Limit as per Drinking Water Standards
1	Color	Hazen	<5.0	25
2	Odor	Unobjectionable	Unobjectionable	-
3	Taste	Agreeable	Agreeable	-

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Sl. No.	Parameter	Unit	Value	Permissible Limit as per Drinking Water Standards
4	Turbidity	NTU	3.3	10
5	pH	-	7.55	6.5 to 8.5
6	Total Hardness	mg/l	80.0	600
7	Chloride (as Cl)	mg/l	23.82	1000
8	Total Iron (as Fe)	mg/l	0.26	1.0
9	Phosphate	mg/l	0.15	-
10	Boron (as B)	mg/l	0.25	5
11	Calcium (as Ca)	mg/l	18.43	200
12	Alkalinity (as CaCO ₃)	mg/l	39.6	-
13	Fluoride (as F)	mg/l	0.59	1.5
14	Sulphate (as SO ₄)	mg/l	14.70	400
15	Total Dissolved Solids (TDS)	mg/l	118	2000
16	Nitrate (as NO ₃)	mg/l	2.45	100
17	Magnesium (as Mg)	mg/l	8.30	30
18	BOD (3 Days at 27°C)	mg/l	<2.0	-
19	COD (as O ₂)	mg/l	6.90	-
20	Electrical Conductivity	Umhos/cm	187.0	-
21	Total Coliform	MPN/100 ml	58.0	-
22	F. Coliform	MPN/100 ml	12.0	-
23	E. Coli	MPN/100 ml	Absent	-
24	Sodium Absorption Ratio	Meq/l	<1.0	-
Source: Water Quality Monitored in EIA study of NH-21 Section from Kiratpur to Bilaspur, Year 2012				

Figure-7: Hydrogeology Map for Solan District



Geology and Seismology

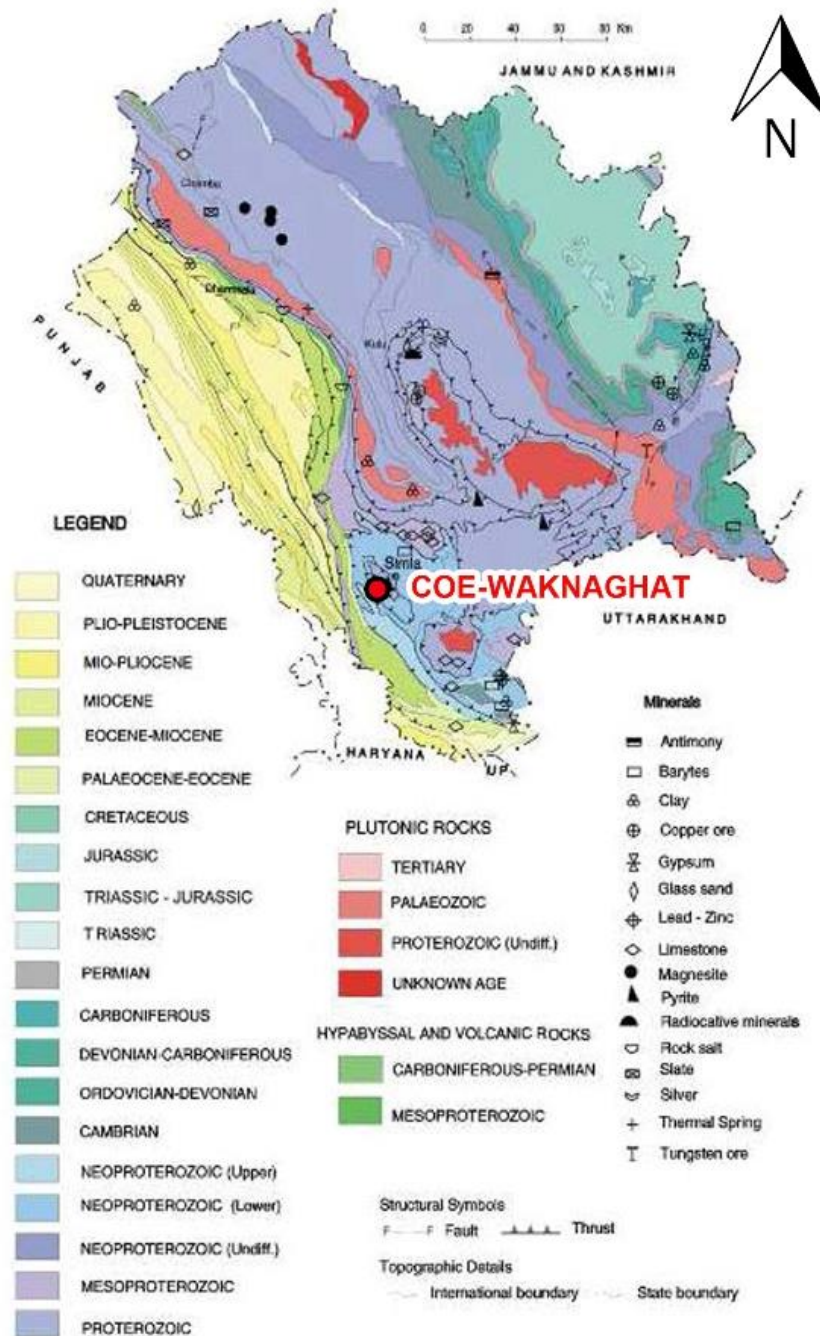
30. Geologically, the rock formations occupying the district range in age from pre-Cambrian to Quaternary period. The generalized geological succession in the district is given below in **Table -8**. The rock masses in the subproject region consist of alluvium and valley fills. The geological map of Solan district is given in **Figure-8**.

Table-8: Geological Description of Solan District

Era	Period	Formation	Composition (Lithology)
Quaternary	Recent to Pleistocene	Alluvium /valley fills/ Older alluvium	Sand with pebble and clay, medium to coarse grained sand with pebble of sandstone and lenses of clay
Tertiary	Pliocene – M-Miocene	Shivalik Group	Sand stone, conglomerate, clay, gravel beds, shale, mudstone
	L-Miocene - Oligocene	Subathu	Sand Stone, Shale, Nodular Clay, Lime stone
Proterozoic	Upper- III	Krols	Red Sandstone, Carbonaceous shale, slate, greywacke, dolomitic limestone
	Lower-III	Simla/Jaunsar	Siltstone, greywacke, sandstone, quartzite, conglomerate, Shale, slate, phyllite, dolomite and meta- volcanics
	Proterozoic-II	Shali/Sunder Nagar	Cherty dolomite, quartzite, limestone, shale, slate, phylitised/ sporadic shale, meta-volcanics etc.
	Un- differentiated	Jutogh Group	Shale, phyllite, schist, staurolite quartzite, dolomite, Limestone, and amphibolite

Source: District Ground Water Brochure District Solan -Central Ground Water Board (Year 2013)

Figure-8: Geological Map of Solan District
GEOLOGICAL AND MINERAL MAP OF HIMACHAL PRADESH



31. India's seismic code divides the country into five seismic zones (I to V). The sub-project stretch comes under seismic zone V as defined by Urban Earthquake Vulnerability Project (UEVP) and the Atlas prepared by the Building Materials Promotion and Technology Council (BMTPC), Government of India and UNDP [IS 1893 (Part I : 2002)]. All structures have been designed considering seismic zone V. It may be mentioned that intensity of earthquake increases from Zone I to V. The Zone V mainly covers Himalayan region in India and Himachal Pradesh being a hilly state lies in Himalayan region. Zones I, II and III mainly cover Central and Southern parts of Indian peninsula. It may be mentioned that after an earthquake of 7.8 intensity on Richter scale in Kangra district in 1905 no major earthquake

has occurred in Himachal Pradesh.

Drainage

32. The COE sub-project site at Wagnaghat is drained by Satluj River as subproject region is in the catchment area of this river. No flooding issues have been reported at the subproject site as site is in undulating area having swift drainage. The drainage map of Solan district is given in **Figure-9**.

Figure-9: Drainage Map of Solan District



B. Ecological Resources

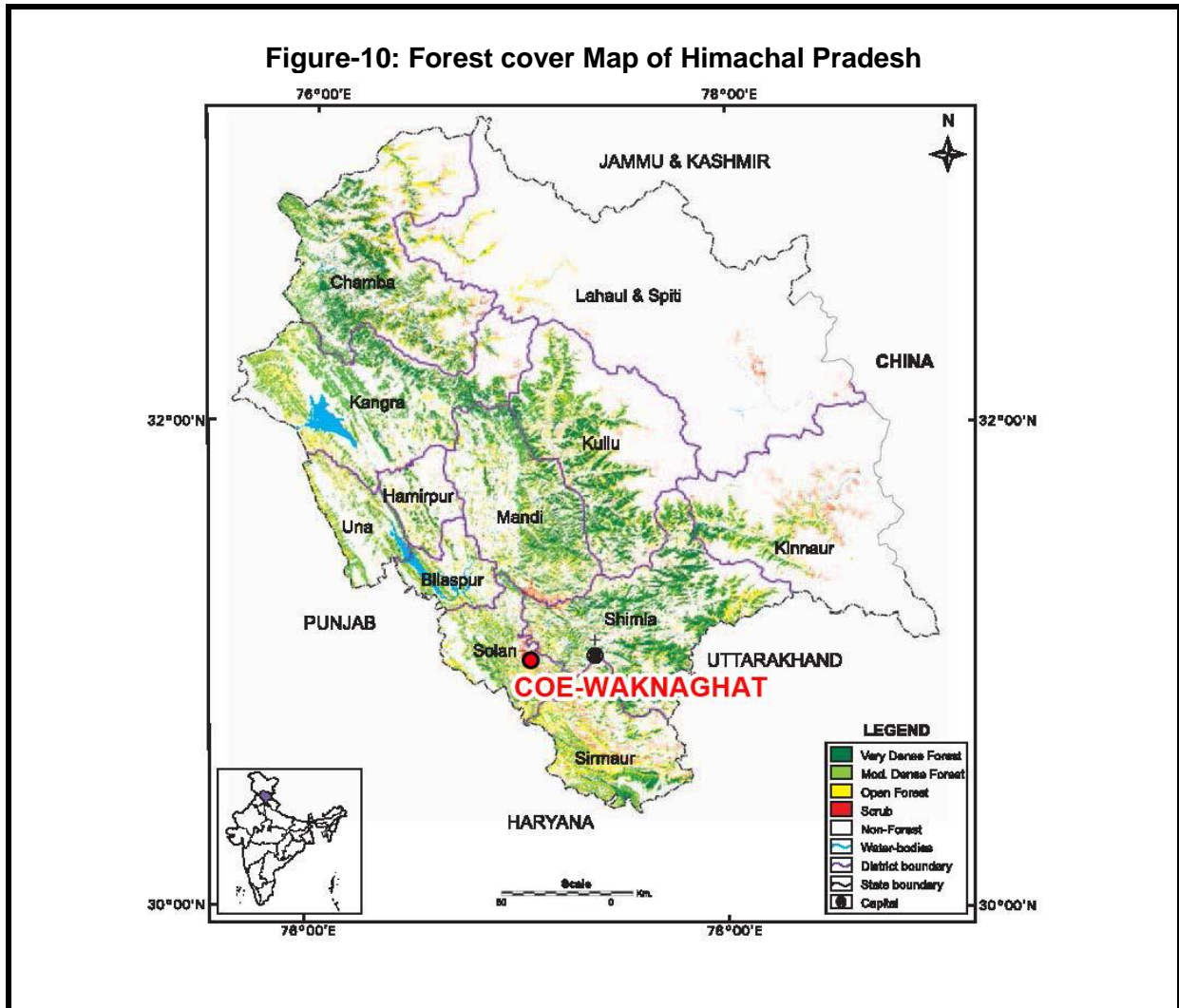
(i) Forests

33. Various types of forests in Himachal Pradesh currently cover an area of nearly 37,691 square kilometers (14,553sq.miles), which is about 38.3% of the total land area of the state. The variation in the landscape has created great diversity of flora and fauna. From the snowbound peaks of the Himalayas to the moist Alpine scrub, sub Alpine forests, dry - temperate and moist- temperate forests to moist deciduous forests, the state possesses a wide biodiversity that in return nurtures a large multiplicity of floral and faunal forms. Reserve Forests constitute 71.11%, Protected Forests 28.52% and Un-classed forests constitute 0.35% of the total forest area. The Solan district has 44.73% area of its total geographical area under forest. The most portions of these forest areas are managed by the Forest Department. The forest areas under very dense, moderately dense and open category are presented below in **Table-9**:

Table-9: Different Categories of Forests in Solan District

District	Very Dense Forest Area (km ²)	Moderately Dense Forest Area (km ²)	Open Forest Area (km ²)
Solan	46	426	394
<i>Source : State Forest Department Web Site (April 2019)</i>			

34. The forests of subproject district can be classified into six main categories namely: (1) the tropical dry deciduous forests, (2) the sal forests (3) the chir forests, (4) the oak forests, (4) the deodar, fir and spruce forests, and (5) the Alpine pastures . Forest cover map for Himachal Pradesh is shown in **Figure -10**.



Source: State Forest Department

35. The sub-project site of COE does not fall within any reserved, protected, or revenue forest areas. The complete vegetation of Himachal Pradesh relies on two factors - height and rainfall. The southernmost part of the state is at a lower altitude level and it contains both humid and subtropical dry broadleaf woodlands, along with subtropical moist broadleaf forests. The majority of area is covered by Himalayan subtropical broadleaf forests. Apart from this, the state has some of the vegetation which is abundant with sal, sisham, and chirpine, dry deciduous and moist broad-leafed forests. The landscape which falls in temperate regions has trees like oak, deodar, blue pine, fir and spruce. The trees found in higher elevations include Alders, birches, rhododendrons and moist alpine scrubs.

36. Himachal Pradesh has abundant growth of fruits like apple, peaches, plums and berries. It is rightly called the 'fruit bowl of India'. There are plenty of fruit orchards and fruits and these fruits are transported to various parts of the country and exported abroad also. The pleasant climate also helps numerous flower varieties like gladiolas, lilies, chrysanthemums, roses, marigolds, carnations, etc. to grow in abundance.

37. Himachal Pradesh is home to approximately 1200 birds along with 359 animal species. This includes leopards, ghoral, snow leopard, musk deer (state animal), and Western Tragopan (state bird). The state is an ideal tourist destination for animal lovers as it hosts 12 main national parks and sanctuaries. It has two major national sanctuaries -the Great Himalayan National Park and the Pin Valley National Park.

(ii) Flora and Fauna around Subproject Site-

38. Since the sub project site is close to habitation area of Majhol village and Waknaghat town, therefore, there are no protected areas within 20 km radius. Around the sub-project site, there is limited fauna because of rural habitation. The common trees in the surroundings of sub-project sites are *Mangifera indica* (Aam), *Cassia fistuca* (Alish), *Premna latifolia* (Baken), *Ficus bengalensis* (Banian), *Zizphus mauratiana* (Ber), *Grewia elastic* (Beuli), *Butea monosperma* (Brahmadake), *Acacia arabica* (Babool), *Ficus glomerata* (Gular), *Syzygium caryophyatum* (Jamun), *Azadirachta indica* (Neem), *Ficus religiosa* (Pipal), *Liriodendron tulipifera* (Popular), *Eucalyptus camaldulensis* (Safeda), *Cassia fistuca* (Amaltash), *Phyllanthus emblica* (Amla), *Jatropoha curcuas* (Arand), *Premna latifolia* (Bakar), *Terminalia belerica* (Bahera), etc. There is no endangered or rare species flora at or surroundings of COE site.

39. The fauna in the surroundings of COE sub-project site includes- Birds such as Bagula, Tota, Koel, Crow, and Mayna. Among the mammals main animals are Jungel Rat, common squirrel, Moles, Shrews, cow, goat, etc. The main reptiles found are Girgit, Dhaman, etc. There are no endangered or rare species fauna at COE site and surroundings as the site is close to Majol village.

40. The water bodies around sub project sites are seasonal in nature because of swift flow. There is not much presence of aquatic life in the water bodies close to the sub-project site.

(iii) Protected Areas

41. The list of protected areas (National Parks and Wildlife Sanctuaries) in Himachal Pradesh is given in **Table 10**. There are three protected areas in Solan district (Chail, and Majathal bird sanctuaries and Darlaghat Conservation Reserve), but these protected areas are located more than 30 km away from the proposed COE site.

Table-5: Protected Areas in Himachal Pradesh

Sl. No.	Sanctuaries	District	Area (km ²)
1	Bandli	Mandi	32.11
2	Chail	Solan	16
3	Chandra Tal	Lahaul & Spiti	38.56 +(11.53 for Consideration)
4	Churdhar	Sirmour	55.52
5	Daranghati	Shimla	171.50
6	Dhauladhar	Kangra	982.86
7	Gamgul-Siyabehi	Chamba	108.40
8	Kais	Kullu	12.61
9	Kalatop-Khajjia	Chamba	17.17
10	Kanawar	Kullu	54.27
11	Khokhan	Kullu	14.94
12	Kibber	Lahaul & Spiti	2220.12
13	Kugti	Chamba	379
14	Lipa Asrang	Kinnaur	31
15	Majathal	Solan	30.86

Sl. No.	Sanctuaries	District	Area (km ²)
16	Manali	Kullu	29
17	Nargu	Mandi	278
18	Pong Dam Lake	Kangra	207.59
19	Rakchham-Chitkul	Kinnaur	304
20	Renuka	Sirmour	4
21	Rupi-Bhaba	Kinnaur	503
22	Sechu-Tuan Nalla	Chamba	390.29
23	Sainj	Kullu	90
24	Shikari Devi	Mandi	29.94
25	Shimla Water Catchment	Shimla	10
26	Simbalbara	Sirmour	27.88
27	Talra	Shimla	46.48
28	Tirthan	Kullu	61
29	Tundah	Chamba	64
30	Water Supply Catchment	Shimla	10
National Parks			
1	Great Himalayan National Park	Kullu	765
2	Pin Valley National Park	Lahaul & Spiti	675
Conservation Areas			
1	Shilli Conservation Reserve	Solan	1.49
2	Shri Naina Devi Conservation Reserve	Bilaspur	17.01
3	Darlaghat Conservation Reserve	Solan	0.67

Source: Himachal Pradesh State Forest Department

C. Economic Resources

Industries

42. The Solan district has 15 notified industrial areas. The district has pharmaceutical, cement, food processing and packaging, electrical accessories, wires and cables, Breweries and communication systems industries. These industries are spread in all parts of district. There are no industries or industrial areas close to sub-project site. There are about 246 large and medium industries in the district. In addition to large and medium industries, there are many micro and small enterprises in the district. The details of number of industries and employment have been presented below in **Table-11**.

Table-11: Details of Industries and Employment in Solan District

Sl. No.	Head	Unit	Particulars
1	Registered (MSEs) Industrial Units	Nos.	5331
2	Registered Medium Scale Units	Nos.	240
3	Registered Large Scale Units	Nos.	106
4	Employment in MSEs Sector	Nos.	69492
5	Employment in Medium Sector	Nos.	21095

Sl. No.	Head	Unit	Particulars
6	Employment in Large Sector	Nos.	24408
7	Number of Industrial Areas	Nos.	15

Source: Directorate of Industries, Government of Himachal Pradesh (Year 2014)

Transportation Facilities

43. The COE Wagnaghat site is well connected with Shimla, Chandigarh, and other destinations in Himachal Pradesh through various national highways and state highways. The nearest rail head from sub-project site is Kalka-Shimla railline at about 9.5 km. The nearest operating airport is Shimla at a distance of about 35 km. No clearance or permission from Airport Authority of India (AAI) is needed as COE building is low height (Ground plus three) and not in flight path.

Land Use

44. A study of the land use (**Table-12**) pattern shows that majority of the area of Solan district is under permanent pastures, grazing land and forest. The land under cropped area is also significant. The barren land area is quite low. The land use of COE site is rural area. If land use of sub project sites is to be seen in terms of classification of **Table 14**, it will fall 'Land put to non agriculture uses'.

Table-6: Land Use Pattern of Solan District

Land use	Area (In 000' hectare)
Geographical Area by Village Papers	180.90
Forest land	20.30
Misc. Tree Crops, Groves (Not included in Net Area Sown)	0.60
Permanent Pastures and Other Grazing Land	77.30
Culturable Waste land	14.90
Land put to Non Agriculture Uses	12.90
Barren and Uncultivated land	11.70
Current Fallows	3.30
Other Fallows	2.40
Net Area Sown	37.60
Area Sown more than Once	26.10
Total Cropped area	63.80

Source: District Census Handbooks 2011

45. **Agricultural Development.** Agriculture is the mainstay of the people and 70% of the total population depends on it. The soil in the district varies from light to sandy heavy and in the valley areas it is sandy to sandy loam. The district has different type of soils which offer great potentialities for growing various types of cereals, fruits, vegetables and other cash crops. The Rabi and Kharif are the principal crops. Wheat and Maize are the staple food as these are produced in maximum quantities. Rice is produced both on irrigated and un-irrigated lands. Kharif is grown on inferior lands. Since the economy of the district basically depends on agriculture hence majority of the workers are engaged in agricultural activities. Despite the hilly topography of the district the agro climatic conditions provide a range of potentialities for growing cash crops like off season vegetables, tomatoes, potatoes, pulses and temperate fruits apart from cereals, millets and oil seeds. Among the cereals wheat, maize and rice are extensively grown. According to data presented in District Census Hand

book (2011), area under Wheat crop was maximum (25346 ha), followed by Maize (22733 ha).

Electrification

46. The Rural Electrification in Solan is 98.30 % and Urban Electrification is 99.0% as per District Census Handbook-2011.

D. Social and Cultural Resources

Population and Communities

47. According to the Census 2011, the total population of Solan district was 5, 80,320 comprising 3, 08,754 males and 2,71,566 females. This population of the district formed 8.45 per cent of the state population. Out of the total population of the district 82.40 per cent was living in rural areas while 17.60 per cent was living in urban areas. Rural population of the district was distributed among 9 sub- district and urban population was spread over in 8 towns. The total urban population in the district was 1, 02,147 persons comprising 59018 males and 43,129 females. The total rural population in this district was 4, 78,173 persons and is composed of 2,49,736 males and 2,28,437 females. This rural population was distributed in 2,544 villages. Out of the total 2,544 villages in the district 2,383 were inhabited villages while 161 villages were uninhabited. The density of population in Solan district in 2011 was 300 persons per sq. km. against the state average of 123 persons. At sub-district level, the density of population varied between 601 in Kasauli sub-district and 178 persons in Ramshahr sub-district. In rural areas, the density of population was 251 persons per sq. km. while in urban areas it was 3,061 persons. Out of the total population of 5,80,320 persons of the district during Census 2011 5,48,579 (94.5 per cent) persons had reported their religion as Hindu followed by 14,678 (2.53 per cent) persons as Muslim and 13,926 (2.40 per cent) persons as Sikh. Remaining Buddhist, Christian, Jain and other religions have a negligible representation in the district. The other major religious communities include Sikhs with 2,387 persons. The total literacy rates of rural and urban areas were 82.2 and 90.4 per cent, respectively. The proportion of male and female literates in rural areas was 88.9 and 75.0 per cent respectively. In urban areas this proportion is 92.5 and 87.5 per cent, respectively. The difference between male and female literacy rates in urban areas is about 5.0 points as against 13.9 points in rural areas.

Health facilities

48. There are good health facilities in Solan district. The Solan district has 06 General Hospitals, 34 Primary Health Centers, 5 Community Health Centers, 5 ESI Dispensaries, and 178 sub- Health centers. In addition to these government facilities, there are many private hospitals and nursing homes in urban centers of the district.

Education facilities

49. There are good education facilities in Solan district. This district has 767 Primary Schools, 139 Middle Schools, 177 Higher Secondary Schools, 07 Government colleges and 9 private colleges. There are many technical education training institutes both Government and privately owned in the Solan district. The district Solan has nine Universities. The current HPSPDP project will also contribute towards skills development and employability of Himachali youth.

Archaeological Resources

50. There are no heritage sites notified by Archaeological Survey of India (ASI) within 300 m distance from the sub-project site. Similarly, no common property resources such as public wells, water tanks, play grounds, common grassing grounds or pastures, market areas and community buildings will be affected by the proposed sub-project.

IV. ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

A. Environmental Impacts

51. Any project creating physical infrastructure will cause some minor impacts on the environment. This IEE examines the potential impacts anticipated during the construction and operation COE Waknaghat, including:

- (i) **Location impacts:** Impact associated with site selection including effect on the environment and resettlement or livelihood related impacts on communities;
- (ii) **Design impacts and Pre-Construction Impacts:** Impact arising from project design, including the technology used, scale of operations, discharge standards, topographic survey, geotechnical survey, etc.;
- (iii) **Construction impacts:** Impact resulting from construction activities including site clearance, earthworks, civil works, etc.; and
- (iv) **Operation and Maintenance impacts:** Impact associated with the operation and maintenance of the infrastructure built in the sub-project.

52. ADB's REA checklist for Buildings was used while screening the site and recommending mitigation measures.

B. Location Impacts

53. The COE sub-project site at Waknaghat is located on unencumbered land owned by the Government of Himachal Pradesh (**Annexure- 2**). No new land has been acquired for this COE, nor has anyone been displaced in anticipation of the proposed ADB project. There are no significant ecological resources in the surroundings COE site as this is located close to village. There are no heritage sites notified by Archaeological Survey of India (ASI) or state archaeological department within the COE delineated area or in the immediate surroundings (within 300 m distance). No significant impacts can arise due to sub-project location as COE building components will not impinge upon any area of ecological, archaeological or historical importance. The subproject site will also not require change in land use as it is already in possession of DOTE GOHP. The COE site is not in the immediate vicinity of national highway or state highway. Hence impacts on account of vehicular air and noise pollution are not anticipated.

54. The COE subproject site is located within seismic zone V and even a small magnitude earthquake may damage COE building.

C. Impacts during Design and Pre-Construction Phase

55. As noted above, the proposed site is owned by GOHP. There are no issues arising due to land acquisition or involuntary resettlement. No tree cutting is required at site. Based on the environmental screening of the site, there are no significant adverse environmental impacts during the design and Pre-construction phases.

D. Impacts during Construction Phase

56. All construction activities to be undertaken at the COE site will be approved by the PMU. The construction stage impacts due to the proposed project components are generic to the construction activities. The EMP emphasizes on the construction impacts and

necessary mitigation measures to be strictly followed by the contractor and supervised by the PWD and PIUs. The key potential impacts are covered in the following paragraphs.

57. **Impact due to stockpiles of construction materials.** Improper stockpiling of construction materials in and around the sites could obstruct movement along access roads. Hence, due consideration will be given for proper materials storage on construction site. Stockpiles will be covered to protect from dust and erosion. Waste materials will be disposed off at identified and approved locations.

58. **Disposal of construction waste.** The construction waste could lead to untidy conditions at site and may find its way to local drains and smaller local streams and siltation and obstruction to natural flow in these drains and streams. In the proposed sub-project, it shall be mandatory for the contractor to ensure proper disposal of the construction waste at the disposal site as designated by the PWD.

59. **Quarry and Borrow pits operations.** Since the civil works are of a small size, all construction material will be procured from market. There will not be any need for direct procurement of stone dust and sand building material from quarries.

60. **Increase in noise levels.** Noise levels in the immediate proximity of sub- project site are expected to increase somewhat during construction. However, these will be largely imperceptible as civil works will be confined to relatively small areas. The duration of construction will also be relatively brief. Transportation of construction materials will be confined to day-time, depending upon extent of construction activity. The increase in noise levels is expected to be between 3-5 dB (A) of ambient noise levels. This increase will be felt up to a distance of 200-300 m only. This noise will be intermittent in nature, and will last only during the construction phase. The construction noise will be felt by the residential houses close to COE site. It may be mentioned that construction noise will be intermittent in nature noise levels outside boundary of COE plot are not anticipated to exceed the stipulated limits of Residential areas. But necessary monitoring of noise levels will be taken up as part of environmental monitoring plan.

61. **Impacts on biodiversity during construction phase.** No major impacts are expected on the biodiversity during the construction phase as the COE site is GoHP owned near the village Majol. There is no requirement of trees and shrubs cutting for the COE construction. There are no endangered species of flora and fauna in the surroundings of COE site.

62. **Disturbance to traffic during construction phase.** At the time of construction, there will be some temporary inconvenience due to transportation of building materials and clearance of debris by trucks. However, since the scale of civil works is relatively small, the inconvenience caused will be relatively minor and limited only to the construction phase. A sample Traffic Management plan is attached in **Annexure- 3**.

63. **Impact on cultural properties.** The proposed sub-project will not have any impact on any religious structure or any other structure of historical and/or cultural significance.

64. **Ground Water.** Ground water will not be extracted and used for construction purposes. The contractor will arrange for water from the market. It will be supplied by the authorized water tankers. The problem of ground water contamination is also not anticipated during the construction phase since there will be proper disposal of the waste water.

65. **Ambient Air Quality.** Generation of dust is anticipated during transportation, excavation, and construction activities. Some dust and gaseous emissions will also be

generated during the construction period from machines such as mixers, and vehicles engaged in transportation of construction materials. Pollutants of primary concern at this stage include respirable and suspended particulate matter (RSPM) and gaseous emissions (NO_x, SO₂, CO, etc.). However, transportation of construction materials will be confined to a few trips per day depending upon extent of construction activity. Therefore, impact at this stage will be temporary and restricted to the close vicinity of the construction sites only.

66. All vehicles and construction equipment operating for the contractor and the consultant will obtain and maintain "Pollution under Control" (PUC) certificates. To control dust emissions, vehicles deployed for borrow materials, sand and aggregate haulage, will be covered with tarpaulins to prevent spillage. Regular sprinkling of water during excavations, loading, unloading, vehicular movement, and raw material transport will prevent spread of dust and other contaminants. Periodic air quality monitoring will be conducted to ensure that emissions comply with the vehicle emission standards specified by the Government of India and ambient air quality standards specified by the Central Pollution Control Board. The contractor will submit emission monitoring results as a compliance with environmental monitoring plan. The impacts related to air pollution on account of construction activities will be felt at residential buildings close to subproject site, if site is not properly barricaded.

67. **Construction Waste.** Some waste will be generated due to excavated earth material and generation of waste from construction activity. Debris and excavated earth material can be reused subject to the approval of the PWD Engineer during the construction. Waste generated during construction and demolition will be disposed off as per law to the satisfaction of the Engineer. The clean-up and restoration operations will be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures and dispose off all garbage from construction site. All construction zones used and affected by the sub-projects will be left clean and tidy, at the contractors' expense as per the satisfaction of the Engineer.

68. The contractor is likely to engage local labor for various construction activities. However, in case of migrant labor has to be engaged, the contractor will establish properly designed labor camp with all basic amenities such as potable drinking water supply and sanitation facilities (septic tanks and soak pit). Dust bins will be placed in adequate numbers. The EMP lays down some measures to address likely adverse impacts associated with the labor camps.

E. Environmental Impacts during Operation Phase

69. Since only vocational training and counseling will be undertaken at the proposed COE, there will not be any adverse environmental impact during operation as adequate sanitation facilities have been planned in COE building. The COE design also provides for adequate parking, accommodation, and safe disposal for waste water and solid waste. The solid waste generated at COE during operation phase will be segregated. Its disposal will be integrated with Waknaghat town waste disposal system. Since septic tanks have been proposed for disposal of waste water, therefore, regular maintenance and cleaning of these need to be undertaken as part of COE operation. There may be some waste on account of operation and maintenance of solar PV cell. The supplier of PV cell will be responsible for collection of waste for possible recycle and reuse.

70. Given the relatively small size of the COE, there will not be any significant vehicular traffic increase on account of COE operation. Most students and staff will be using public transport. A diesel generator set will be required, but only during power cuts. The generator

will be of the silent type, and will comply with the emission levels stipulated by Central Pollution Control Board.

71. **Safety Measures.** The design of the COE includes structural and seismic safety measures required by India's latest building codes (in seismic zone V). The other safety features are explained below:

- The COE will be equipped with fire-fighting systems with portable fire extinguishers and smoke detectors. The staircase will have adequate width to allow for people to exit the COE building during any fire-related or other eventuality.
- During natural calamities, the operations will be stopped. The trainees and staff will be safely evicted as per Disaster Management plan of Himachal Pradesh.
- Necessary first aid facilities will be provided at the COE building.

72. **Socioeconomic Impacts.** The establishment and operation of COE at Wagnaghat will have a positive development impact since it will provide market-relevant vocational training to the needy urban youth, and help them in improving their livelihoods and / or getting formal jobs.

73. **Flora and Fauna.** Since the COE will be located in an open area near Majol village, so no adverse impacts on fauna and flora are anticipated due to operation. Further, to enhance the natural look of the COE building and premises, plantation of shrubs and landscaping will be taken up along the pathways and vacant space. There is no existence of any wild life park, bird sanctuary, national park or any other area notified by the GoHP or MoEFCC for ecological importance within an aerial distance of 15 km from COE site.

74. **Emergency Plan for Accident and Natural Hazards-** For operation phase onsite emergency plan will be prepared by the COE Manager for minor accidents and fire. For natural calamities the Disaster Management Plan prepared by **DOE** will be followed. The Disaster Management Plans have been prepared by the respective departments of GoHP as per provisions of Disaster Management Act 2005 of Government of India.

F. Description of Planned Mitigation Measures

75. Screening of environmental impacts is based on the magnitude and duration of the impact. **Table-13** provides the potential environmental impacts and the mitigation measures including the institutional responsibilities for implementing the same. The COE site is located sufficiently away from protected areas and the components proposed will not impact any environmentally sensitive or protected areas. All sub-project activities including construction and operation will take place within available government land.

Table-7: Summary of Environmental Impacts and Planned Mitigation Measures

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
1	Location Impacts				
1.1	Lack of sufficient planning to assure long term sustainability of the COE building and ensure protection specially from earthquake and other natural disasters	Permanent	Major	<p>The design of COE building has been completed considering earthquake coefficient of zone V.</p> <p>The COE site is not on the banks of any river or major streams.</p>	PMU and PWD
2	Design and Pre-construction Impacts				
2.1	Consents, permits, clearances, no objection certificates (NOC), etc.	Permanent	Major	<p>Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.</p> <p>Acknowledge in writing and provide report on compliance on all obtained consents, permits, clearance, NOCs, etc.</p> <p>Include in detailed design drawings and documents all conditions and provisions if necessary</p>	PIU and PWD
2.2	Layout of components to avoid impact on the aesthetics of the site	Permanent	Major	The sub-project components will not have any adverse impacts on aesthetics of site as these involve construction of COE building in open area close to village. Hence, no mitigation measures are warranted.	Not Applicable
2.3	Slope stability related issues	Permanent	Minor	The COE site is a plain land. No slope stability issue is involved in the construction of building.	<p>Not applicable</p> <p>PMU and PWD</p>
2.4	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping,	Permanent	Moderate	Design of proposed COE will allow efficient drainage at the site and maintain natural drainage patterns. The site is already located in an undulating area so site drainage will not	PMU and PWD

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
	excavation works, construction of parking lots, and addition of paved surface.			be an issue.	
2.5	Integration of energy efficiency and energy conservation programs in design of COE	Permanent	Moderate	Following measures have been included in the design to enhance energy efficiency: <ul style="list-style-type: none"> • Usage of recyclable materials like wood substitutes. • Installation of BEE certified equipment • Usage of energy efficient lighting fixtures (LED and solar). • Provision of Solar power generation 	PMU and PWD
3	Construction Impacts				
3.1	Construction Camps - Location, Selection, Design and Layouts	Temporary	Moderate	Construction camp at COE site will be located within the site as far as possible. The construction camp, if established at COE site will not affect the day-to-day activities of local residents in the vicinity of site. Adequate sanitation facilities shall be provided at camp site and no waste water will be discharged outside.	Contractor and PIU
3.2	Traffic circulation plan during construction	Temporary	Moderate	Prior to commencement of site activities and mobilization on ground, the contractor will prepare a traffic circulation plan for safe passage of local traffic during construction stage. This will include alternative access routes, traffic regulations, Signages, etc. The contractor will get these plans approved from the PWD (the Engineer). The contractor will disseminate the traffic circulation plan around the COE site.	Contractor, and PWD
3.3	Impacts on flora and fauna	Temporary	Moderate	Following mitigation measures are planned: 1-PMC will Conduct site induction and environmental awareness programs at the COE site.	Contractor and PWD

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				<p>2-The contractor will Limit activities within the work areas.</p> <p>3-Storage of construction materials will be within the COE plot.</p> <p>4-PWD will prepare site specific landscape and shrubs and tree plantation plans at the end of construction period. These plans will be implemented.</p>	
3.4	Site clearance activities, including delineation of construction areas	Temporary	Moderate	<p>The commencement of site clearance activities will be undertaken with due permission from the Environment Specialist of the PWD/ PMU to minimize environmental impacts.</p> <p>All areas used for temporary construction operations will be subject to complete restoration to their former condition with appropriate rehabilitation procedures.</p>	Contractor and PWD
3.5	Drinking water availability	Temporary	Major	Sufficient supply of potable water will be provided and maintained at construction site. If the drinking water is obtained from an intermittent public water supply, then storage tanks will be provided.	Contractor and PWD
3.6	Waste disposal	Permanent	Major	Location of disposal site for construction waste will be finalized by the Environmental Specialist of the PWD and PMU. He will confirm that disposal of the material will not impact the water body or environmentally sensitive areas. He will also ensure that no endangered or rare flora is impacted by such materials.	Contractor and PWD
3.7	Stockpiling of construction materials	Temporary	Moderate	Stockpiling of construction materials should not impact or obstruct the local drainage and Stockpiles will be covered to protect from dust and erosion.	Contractor and PWD

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
3.8	Soil Erosion	Temporary	Moderate	There may be requirement for temporary slope protection during construction at the excavated areas. These requirements should be met. Adequate measures will be taken up at this site so that there is no soil erosion causing risks in the vicinity.	Contractor and PWD
3.9	Soil and Water Pollution due to fuel and lubricants, construction waste	Temporary	Moderate	The fuel storage and vehicle cleaning area at each sub-project site will be stationed such that water discharge does not drain into the local drain. Soil and water pollution parameters will be monitored as per monitoring plan.	Contractor and PWD
3.10	Siltation of water bodies due to spillage of construction wastes	Temporary	Moderate	No disposal of construction wastes will be carried out into any streams near the COE site. Extraneous construction wastes will be transported to the pre-identified disposal sites for safe disposal.	Contractor and PWD
3.11	Generation of dust	Temporary	Moderate	The contractor will take every precaution to reduce the levels of dust at construction site. The site will be properly barricaded with prefabricated MS sheets to avoid spread of dust.	Contractor and PWD
3.12	Emission from Construction Vehicles, Equipment and Machinery	Temporary	Moderate	Vehicles, equipment and machinery used for construction will conform to the relevant Standard (vehicular emission standards of Government of India and CPCB specified standards for equipment and machinery) and will be regularly maintained to ensure that pollution emission levels comply with the relevant requirements.	Contractor and PWD
3.13	Noise Pollution	Temporary	Moderate	Noise limits for construction equipment used in this project will not exceed 75 dB (A). The site will be properly barricaded with prefabricated MS sheets. This will help in	Contractor and PWD

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				arresting noise propagation outside.	
3.14	Material Handling at Site	Temporary	Moderate	<p>Workers employed on mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles.</p> <p>Workers, who are engaged in welding works, will be provided with welder's protective eye-shields.</p> <p>Workers engaged in stone breaking activities will be provided with protective goggles and clothing.</p> <p>The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The Engineer will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.</p>	Contractor and PWD
3.15	Disposal of Construction Waste	Temporary	Moderate	Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed off around the sub-project site and especially in vacant plots in the locality.	Contractor and PWD
3.16	Safety Measures During Construction	Temporary	Moderate	<p>Adequate safety measures for workers during handling of materials at the COE site will be taken up.</p> <p>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, accidental injury, etc. First aid treatment will be made available for all injuries likely to be sustained during the course of work.</p> <p>The Contractor will conform to all anti-malaria instructions given to him by the Engineer.</p>	Contractor and PWD
3.17	Clearing of Construction of	Temporary	Major	Contractor will prepare site restoration plan	Contractor and PWD

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
	Camps and Restoration			for approval by the Engineer. The construction camp site restoration plans are to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer	
3.18	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	Temporary	Major in case of natural calamity and minor in case of accidents or mishaps at construction site	The onsite emergency plan will be prepared by the contractor in consultation with PWD and PMC. For natural calamities, disaster management plan prepared by the PWD under the provisions of Disaster Management Act 2005 will be followed.	Contractor
4	Operation and Maintenance impacts				
4.1	Environmental Conditions	Temporary	Moderate	Air, water, and noise levels will be monitored periodically as per the Environmental Monitoring Plan prepared.	DoUD
4.2	Safety risks	Temporary	Major	All safety features provided as part of COE building construction will be maintained.	DOUD
4.3	Unhygienic conditions due to poor maintenance of sanitation facilities and irregular solid waste collection	Temporary	Severe	The implementing agencies will carry out maintenance of the toilets, and carry out the regular collection and disposal of wastes to the local disposal sites. The septic tanks will be maintained and emptied regularly.	DOUD
4.4	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	Temporary	Major in case of natural calamity and minor in case of accidents or mishaps at construction site	The COE Manager will prepare on site emergency plan for possible minor accidents and mishaps during operation phase. For natural calamities, the disaster management plan prepared by DOTE will be followed .	Manger COE for Onsite Emergency Plan and DOTE for Disaster Management Plan

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Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
4.5	Waste from operation and maintenance of Solar PV Cell	Occasionally	Minor	The supplier of Solar PV cell will collect any waste generated on account of operation and maintenance for possible recycle/reuse/disposal as operations will be maintained by the supplier.	Operator Solar PV Cell

G. Land Acquisition and Resettlement

76. The proposed COE site is DOTE owned land. It is encumbrance free. Hence, there will not be any acquisition of private land. Since COE site is unencumbered land, therefore, there is no acquisition of any private assets. At the proposed COE site, there are no squatters or encroachers. Hence, there is no requirement of any rehabilitation and resettlement for COE Wagnaghat construction.

V. ENVIRONMENT MANAGEMENT PLAN (EMP)

A. Institutional Arrangements for Project Implementation

77. The Government of Himachal Pradesh through DOTE is the executing agency. The executing agency (i) assumes overall responsibility for the execution of the project and reporting; (ii) engage adequate permanent or fixed-term staff to implement the Project; (iii) setup a state-level project management unit (PMU) and project implementation units (PIUs) at local sub-project level; (iv) provides overall strategic guidance on technical supervision and project execution; and (v) ensures overall compliance with the loan covenants.

78. The implementing agencies in the project are HPKVN, DTE, DOHE and PWD. The implementing agency responsibilities include (i) project planning and budgeting; (ii) day-to-day assistance, supervision and guidance for the project implementation units and their consultants; (iii) review sub-projects for due diligence requirements and approve sub-project proposals; (iv) bidding, evaluation and contract award; (v) managing and disbursing funds; (vi) review compliance with loan covenants, contract specifications, work plans and quality control; and (vii) consolidate and submit progress reports, finance and accounting / audit reports, and matters requiring higher level decision to state-level empowered committee (SLEC) and ADB.

79. A State-level empowered committee (SLEC) has been established in Himachal Pradesh, chaired by State's Chief Secretary, with Principal Secretary/Secretary of the Department of Planning as Member Secretary and comprised of Secretaries from relevant line departments (PWD, DOUD, DORD, DOLE, HPKVN MD). The SLEC has been empowered to take all decisions on behalf of the State and will (i) act as a policy making body, (ii) provide overall advice and guidance to the State's executing agency and PMU, and (iii) accord all approvals under the project.

80. DOTE has established a PMU, headed by a full-time Project Director (PD) at HPKVN, and consisting of personnel drawn from relevant line departments and market. This PMU also has safeguards expert (social and environment). The PMU is supported by the Project Management Consultants (PMC). The PMU is the nodal agency for overall management of all program activities and is responsible for: (i) project planning and budgeting; (ii) providing day-to-day assistance, supervision and guidance for the PIUs and PWD; (iii) reviewing sub-project to satisfy ADB's due diligence requirements and approving sub-project proposals submitted by PIUs and line departments; (iv) bidding, evaluation and contract award; (v) managing and disbursing funds; (vi) reviewing compliance with loan covenants, contract specifications, work plans and quality control; (vii) consolidating and submitting progress reports, finance and accounting/audit reports, and matters requiring higher-level decision, to the SLEC and ADB.

81. The COE sub-project will be implemented by the Project Implementation Unit (PIU) at local level (Wagnaghat), comprising of personnel drawn from relevant line departments on deputation and outside of government and will be headed by Executive Engineer PWD. The PIU will be responsible for: (i) prioritizing and preparing sub-project proposals; (ii) providing day-to-day assistance, supervision and guidance; (iii) conducting detailed assessments and surveys including public consultation and input from stakeholders; (iv) preparing detailed designs, specifications, schedule of quantity, bidding documents, and related documentation; (v) implementing civil works and related activities; (vi) reporting to PMU; (vii) preparing regular progress reports for the SLEC, the executing agency and ADB through PMU; and (viii) supervising construction, conducting quality control, approving progress payments to contractors; and (ix) maintaining records and accounts on an up-to-date basis and making these available to ADB, its missions, or auditors for inspection.

82. The Project Management Consultant (PMC) is has been engaged to provide support

to the PMU in overall planning, risk management, implementation, monitoring and evaluation of project under the HPSDP. The PMC also assists the PMU and PIUs in meeting the relevant requirements of ADB, GOHP, and GOI for project implementation. The PMC reports to and work under the overall guidance of the PMU. The scope of services of the PMC's include: (i) planning, reporting, and communication; (ii) establishment of procedures and systems; (iii) review and preparation of plans, manuals and reports; (iv) overall project management, monitoring and implementation of MIS; and (v) social, environmental, archaeological, occupational health and safety, community participation and gender action compliance monitoring.

83. The executing agency has also engaged one agency for the quality check and to meet timeline requirements. This agency works under the guidance of PMU. The scope of services of the agency include but not necessarily be limited to: (i) surveys, verification of feasibility studies and base maps; (ii) project planning and management support to the PIU; (iii) finalization of design criteria, preparation of manuals, guidelines and systems; (iv) preparation of detailed design and bid documents; and (v) construction management and contract administration.

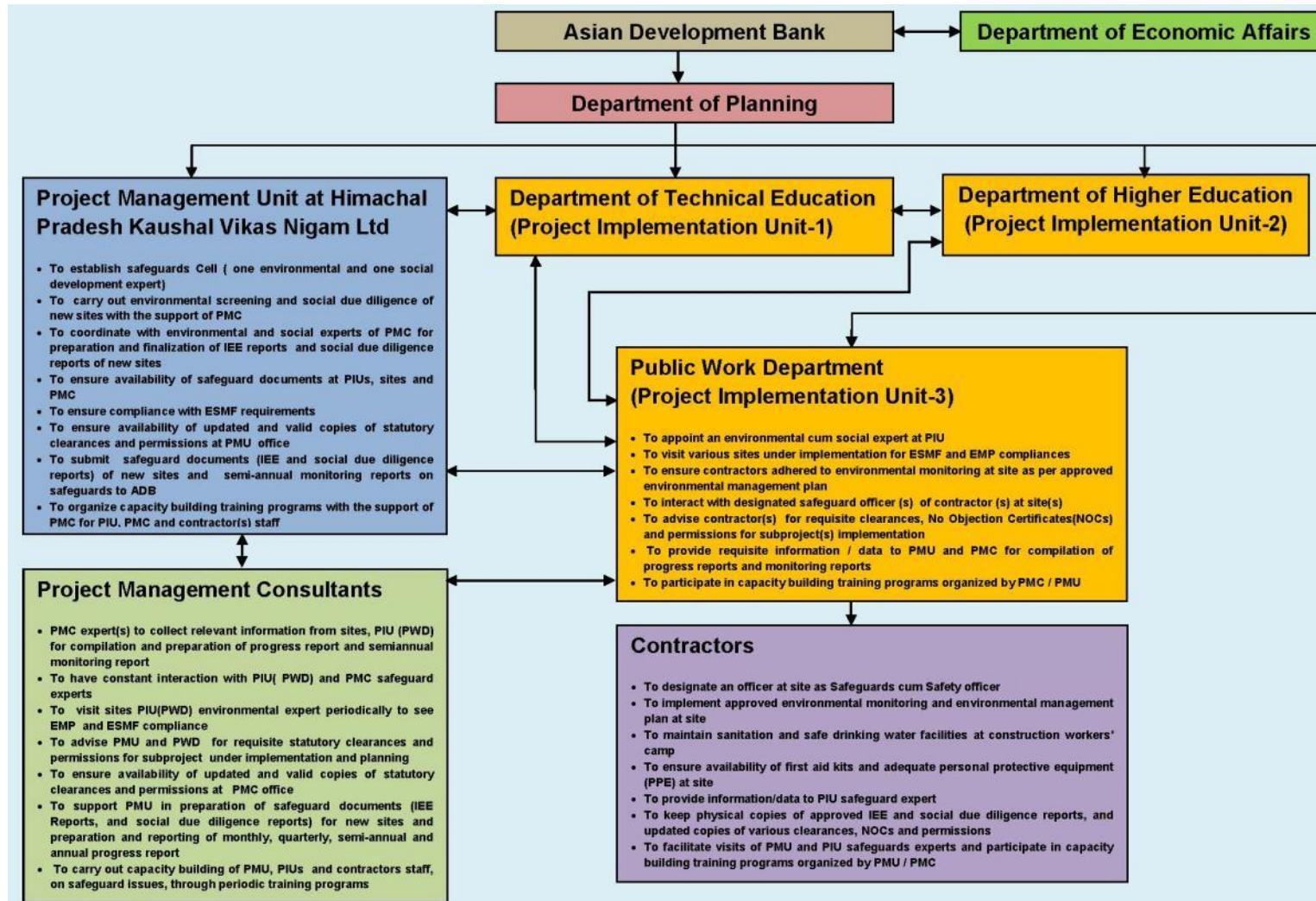
84. In order to ensure effective implementation of safeguard related components in the project PIU at PWD will designate an officer as a safeguard person (an environmental cum social expert) in the team. This designated safeguard officer will ensure compliance with ESMF requirements, and implementation of environmental management plans of sub-project at site through contractor.

85. The PMC also has safeguard experts in their team to support PMU in reporting, safeguards related documents preparation, disclosure and capacity building of PIUs, PMU and contractor(s). The PMU at HPKVN established a safeguard cell comprising of an environmental expert, and a social development expert.

86. The contractor at COE site will designate one officer as safeguard cum safety officer for the implementation of IEE and EMP requirements at site. The project implementation arrangement for safeguard compliance has been shown below in **Figure - 11**.

87. The EMP for Pre construction, construction and operation phases is given in **Tables- 14 to 16**

Figure-11: Project implementation arrangement for safeguard compliance



B. Responsibility for updating IEE during Pre-Construction and Construction

88. **Responsibility for monitoring.** During construction, the Environmental Specialist of the Safeguards cell at PMU (at HPKVN) and the designated representative engineer of the PWD will monitor the contractor's performance. The PMC will support the monitoring of the project. During the operation phase, monitoring will be the responsibility of the PMU. The Environmental specialist PMU will prepare semi-annual reports.

89. **Responsibility for Reporting.** PMU at HPKVN will submit semi-annual reports on the implementation of the EMP to ADB. It will permit ADB to field environmental review missions to examine in detail, the environmental aspects of the project. Any major lapses in adhering to the ESMF and IEE and / or EMPs for specific sub-projects should be reported to ADB immediately. The PMC's Environment Safeguard Specialist will assist the PMU in finalizing the semi-annual and annual progress reports. For any non compliance observed corrective actions will be taken in a time bound manner. The cost for mitigating non compliance will be borne by the contractor as per contract provisions. In case of mitigation costs not coming in scope of contract, these will be met out of contingencies built in EMP cost and in overall project cost.

Table-8: Pre-Construction Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created.	The COE Design has included provisions for ensuring effective maintenance and protection of the assets to be created so as to ensure the long term sustainability. The long term sustainability has been ensured by taking into consideration appropriate Bureau of Indian Standards Codes (BIS) for COE building design, Seismic Zone V coefficient, appropriate wind load factor (corresponding to 39 m/s wind speed), and detailed design after carrying geotechnical investigations and topographic surveys.	Verification of site specific design parameters	PWD	PMU and PMC	Review after completion of detailed design	Part of PWD and PMC Professional Fee
2	Layout of components to avoid impacts on the aesthetics of the COE site and surroundings	The site and layout of COE have been finalized at vacant land in an open area. The exterior of COE building will mix well with the existing building in Waknaghat town and Majol village.	COE building's exterior	PIU and PWD	PMU and PMC	Review after completion of detailed design	Part of PWD and PMC Professional Fee
3	Slope stability related issues	The COE site is undulating so adequate slope protection measures will be included in detailed design.	Slope protection measures on side slopes of access path,	PIU and PWD	PMU and PMC	Review of recommended slope protection measures	Part of PWD and PMC Professional Fee

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		Further, during construction any exposed slopes at excavated areas will be covered and slope protection measures will be provided.	internal roads, etc.				
4	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, construction of parking lot, and addition of paved surfaces	Design of proposed COE building enables efficient drainage of the plot. The drainage of COE building will be integrated with existing drainage pattern of site during detailed design phase of the subproject. The storm water generated will be diverted to local drains through a properly constructed drainage system. Since COE site is in hilly region, therefore, there is swift flow and drainage is not an issue.	Arrangement for proper diversion of storm water runoff	PIU and PWD	PMU and PMC	After mobilization of contractor at the site, submission of detailed design and during establishment of construction camp at COE site.	Incidental to construction cost
5	Integration of energy efficiency and energy conservation programs in design of sub-project components	The detailed design for the proposed COE at Wagnaghat has ensured the environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, etc. The design considers the following energy efficiency measures: <ul style="list-style-type: none"> • Usage of recyclable materials like wood 	Specifications of rain water harvesting structures, electrical fixtures, details of water heating system	PIUs and PWD	PMU and PMC	During finalization of detailed design	Part of project cost

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		substitutes. • Installation of BEE certified equipment • Usage of energy efficient lighting fixtures (LED) • Provision of P-V cells on roof top for solar power.					
6	Consents, permits, clearances, no objection certificate (NOC), etc.	Obtain all necessary consents, permits, clearances, NOCs, etc. prior to start of civil works. Acknowledge in writing and provide report on compliance all obtained consents, permits, clearances, NOCs, etc.	Consents, permits, clearance and NOCs Records and communications	PIU	PMU	check consent for establishment of construction camp at COE site, and approval from civic authorities	Project cost
7	Establishment of baseline environmental conditions prior to start of civil works	1-Conduct documentation of location of components, areas for construction zone (Camp, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates 2- Carry out environmental monitoring at COE site for ambient air quality, water quality and noise levels to establish baseline environmental monitoring for	Records and Photographs, baseline environmental monitoring results	Contractor	PIU and PWD	Once prior to start of construction works	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		the parameters indicated in the monitoring plan					
8	Utilities	<ul style="list-style-type: none"> The locations and operators of utilities to be impacted should be identified and documented in detailed design documents to prevent unnecessary disruption of services during the construction phase. Require contractor to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. Obtain from the PIU and/or PWD the list of affected utilities and operators; If relocations are necessary; contractor will coordinate with the providers to relocate the utility. 	<p>List and maps showing utilities to be shifted</p> <p>Contingency plan for services disruption</p>	<ul style="list-style-type: none"> PWD will prepare preliminary list and maps of utilities to be shifted During detailed design phase, contractor to (i) prepare list and operators of utilities to be shifted; (ii) contingency plan 	PIUs and PWD	Pre-Construction Phase	Contractor
9	Social and Cultural Resources	<ul style="list-style-type: none"> Consult Archaeological Survey of India (ASI) or Himachal Pradesh State Archaeology Department to obtain an expert assessment of the archaeological potential of 	Chance find protocol	<ul style="list-style-type: none"> PMC to consult ASI or HP State Archaeology Department PMC to develop protocol for chance finds 	PMU	Prior to start of construction activities	PMC

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		<p>COE site although no such potential is seen.</p> <ul style="list-style-type: none"> Consider alternatives, if the COE site, is found to be of medium or high risk. Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. Develop a protocol for use by the contractor in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. 					
10	Construction Camp- Locations, Selection, Design and Layout	<p>Sitting of the construction Camp, at the COE site, shall be as per the guidelines below and details of layout to be approved by PWD.</p> <p>1-The potential locations for labor camp and construction camp shall be identified by the contractor and this identified site shall be visited by the environmental expert</p>	Construction Camp site, and locations of material storage areas, sanitation facilities	Contractor	PWD and PIU	At the time of construction camp establishment and finalization of storage areas	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		of PMU safeguards cell along with environmental expert of PWD and one having least impacts on environment will be approved by the PWD and PMU. As far as possible, construction camp and labor camp will be established at vacant space of plot or a house will be hired in the vicinity of site. Locations for storage of construction materials shall be identified at the site or at any suitable buildings close to COE site. Sanitation facilities at construction camp shall be adequately planned.					
11	Sources of construction materials	<p>1-Use quarry sites and sources licensed by the GOHP. The copies of environmental clearance of the quarries shall be submitted by the contractor.</p> <p>2-Verify suitability of all material sources and obtain approvals from PIU.</p> <p>3-No new quarry will be opened as COE subproject is small.</p> <p>4-Submit to PWD on a</p>	Permits issued to quarries and sources of materials	Contractor PMC and PWD to verify sources (including permits) if additional is requested by contractor	PMU and PIU	Upon submission by contractor	PMC and PWD as part of consultancy fee

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		monthly basis documentation of sources of materials.					
12	Access for Construction material transportation	<p>1-Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of COE site.</p> <p>2-Schedule transport and hauling activities during non-peak hours.</p> <p>3-Locate entry and exit points in areas where there is low potential for traffic congestion.</p> <p>4-Keep the site free from all unnecessary obstructions.</p> <p>5-Drive vehicles in a considerate manner. Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours.</p>	Traffic management plan	Contractor	PIU and PWD	During Delivery of construction materials	Contractor
13	Occupational health and safety	<p>Comply with IFC EHS Guidelines on Occupational Health and Safety.</p> <p>Develop comprehensive site-</p>	Health and safety (H&S) plan	Contractor	PMU and PMC, PIU and PWD	During construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		<p>specific health and safety (H&S) plans. The overall objective is to provide guidance to contractor on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.</p> <p>Include in H&S plan measures such as: (i) type of hazards at COE construction site; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.</p> <p>Provide medical insurance coverage for workers.</p>					
14	Stakeholder consultations	Continue information dissemination, stakeholder consultations, and	-Disclosure records - Consultations	PMU,PMC PIU,PWD and Contractor	PMU and PMC	• During updating of IEE Report	PMU and Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		involvement/participation of stakeholders during project implementation.				<ul style="list-style-type: none"> • During preparation of site- and activity-specific plans as per EMP • Prior to start of construction • During construction 	

Table-9: Construction Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Sanitation and drinking water facilities at construction Camp	The contractor shall provide sanitation facilities at the camp site. These facilities will include dust bins in adequate numbers for solid waste collection, drinking water facilities, and separate toilets for male and females. These toilets facilities shall be maintained and septic tanks/soak pits shall be provided at the toilets. The dust bins shall be regularly emptied and waste from camp site shall be disposed	Construction camp sanitation and drinking water facilities	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		off at designated locations.					
2	Traffic Circulation plan during construction phase	Prior to commencement of site activities and mobilization on ground ,the Contractor will prepare and get approved from the Engineer (PWD),circulation plan during construction for safe passage of public vehicles so that locals are not at inconvenience. The Contractor with support of the PIU will carry out dissemination of these information and circulation plan at appropriate locations at site and surroundings.	Safe movement of Traffic	Contractor	PWD and PIU	Every day during construction phase	Contractor
3	Site clearance activities, including delineation of construction areas	Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Environmental Experts of PWD and PMC. All areas used for temporary construction operations will be subjected to complete restoration to their former conditions with appropriate rehabilitation procedures. The photographic records shall be maintained for the	Pre-construction records of site and vegetation in area of construction	Contractor	PWD and PIU	Duration of site preparation	PWD and PIU

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		temporary sites used for construction. These will help in proper restoration.					
4	Drinking water availability at Construction camp and construction site	Sufficient supply of cold potable water to be provided and maintained. If the drinking water is obtained from an intermittent public water supply then storage tanks will be provided. For this contractor will submit plans how availability of drinking water shall be assured. In case it is obtained from the natural spring then permission from local authorities shall be obtained. The monitoring of drinking water quality shall be taken up as per monitoring plan. This is to confirm that drinking water quality meets standards specified in IS:10500 for drinking water.	Water supply source and availability of water, permission of local authority if obtained from local spring	Contractor	PWD and PIU	During Construction phase regularly	Contractor
5	Waste disposal	The pre-identified disposal location shall be part of Comprehensive Waste Disposal Plan. Solid Waste Management Plan to be prepared by the Contractor in consultation with local civic authorities. The Environmental	Waste Disposal sites, waste management plan	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		Specialist of PWD shall approve these disposal sites after conducting a joint inspection on the site with the Contractor. Contractor shall ensure that waste shall not be disposed off near natural streams in the surroundings of site and along the access path.					
6	Stockpiling of construction materials	Stockpiling of construction materials will be done in such a way that it does not impact and obstructs the drainage. The stockpiles will be covered to protect from dust and erosion.	Stockpiling sites at COE site	Contractor	PWD and PIU	Regularly during construction phase	Contractor
7	Arrangement for Construction Water	(i) The Contractor shall provide a list of locations and type of sources from where water for construction shall be acquired. (ii)The contractor shall use ground/surface water as a source of water for the construction with the written consent from the concerned Department. (iii)To avoid disruption/disturbance to other water users, the Contractor shall arrange water from market or from local municipality and consult PWD before	Water availability at identified water source locations	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		finalizing the source.					
8	Soil Erosion	Slope protection measures will be undertaken as per design to control soil erosion.	Locations of slope protection	Contractor	PIU and PWD		Contractor
9	Water Pollution from Construction Wastes	The Contractor shall take all precautionary measures to prevent entering of wastewater into any local stream during construction.	Sub-project site	Contractor	PIU and PWD	Regularly during construction phase	Contractor
10	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 site shall be located at least 500 m away from the natural streams. 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. Waste water from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be treated in an oil interceptor before discharging it on land	Vehicle parking, refueling sites, Oil interceptor functioning	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		or into surface water bodies or into other treatment system.					
11	Soil Pollution due to fuel and lubricants, construction wastes	The fuel storage and vehicle cleaning area will be stationed such that spillage of fuels and lubricants does not contaminate the ground. Soil and pollution parameters will be monitored as per monitoring plan.	Vehicle maintenance and parking area, soil quality monitoring results	Contractor	PIU and PWD	Regularly during construction phase	Contractor
12	Siltation of water bodies due to spillage of construction wastes	No disposal of construction wastes will be carried out into the surface water bodies. Extraneous construction wastes will be transported to the pre-identified disposal sites for safe disposal.	Water bodies specially natural streams	Contractor	PIU and PWD	Regularly during construction phase	Contractor
13	Generation of dust	The contractor will take every precaution to reduce the levels of dust at construction site. All filling works to be protected/ covered in a manner to minimize dust generation. In order to minimize impacts in the surroundings, the COE site will be properly barricaded with prefabricated MS sheets of adequate height (3-4 m). The monitoring of ambient	Sub-project site, air quality monitoring results	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		air quality will be taken up as per monitoring plan.					
14	Emission from Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery used for construction shall conform 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 silent/quiet equipment available in the market shall be used in the COE construction. The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced for verification whenever required.	PUC certificates of vehicles and machinery	Contractor	PIU and PWD	Regularly during construction phase	Contractor
15	Noise Pollution	The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the MoEFCC and 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	Certificates of vehicles conforming noise standards, noise monitoring results	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		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 not exceed 75 dB (A). The COE site will be properly barricaded with MS Sheets of adequate height to avoid impacts of noise generated due to construction activities. Noise monitoring will be carried out as per monitoring plan.					
16	Impacts on flora and fauna	Minimize impacts on flora and fauna during construction phase by limiting site clearance bare minimum and limiting all types of pollution generation	Environmental monitoring reports, Trees and shrubs planted at COE site	Contractor	PWD and PIU	Regularly during construction phase	Contractor
17	Material Handling at Sub-Project site	Workers employed on mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles. Workers, who are engaged in welding works, will be provided with welder's protective eye-shields.	Data on available personal protective equipment	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The PWD will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.					
18	Disposal of Construction Waste, and Debris	The Contractor shall confirm that safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed of in open area near COE site	Disposal site	Contractor	PIU and PWD	Regularly during construction phase	Contractor
19	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	The onsite emergency plan will be prepared by the contractor in consultation with PWD and PMC. For natural calamities, disaster management plan prepared by the PWD under the provisions of Disaster Management Act 2005 will be followed.	Onsite emergency plan document and Disaster Management Plan document of PWD	Contractor	PWD	Mock Drill every quarter	Contractor
20	Safety Measures During Construction	Adequate safety measures for workers during handling	Records of availability of	Contractor	PIU and PWD	Regularly during	Contractor

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		of materials at the proposed COE site will be taken up. The contractor has to comply with all regulations for the safety of workers. Precaution will be taken to prevent danger of the workers from accidental injuries, fire, etc. First aid treatment will be made available for all injuries likely to be sustained during the course of work. The contractor will conform to all anti-malaria instructions given to him by the Engineer.	personal protective equipment, availability of first aid kits			construction phase	
21	Clearing of Construction of Camp and Restoration	Contractor to prepare site restoration plans for approval by the Engineer (PWD). The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the PWD	Restoration plan, and records of pre-construction of temporary sites	Contractor	PIU and PWD	End of construction phase	Contractor

Table-10: Operation Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise levels, and water quality will be taken up as per monitoring plan through an approved monitoring agency. Necessary boundary wall and plantation around boundary will be maintained to screen vehicular traffic emissions from access road.	Monitoring results and relevant standards	COE Operation and Management Team through Pollution Monitoring Agency	PIU	As per monitoring Plan	HPKVN
2	Unhygienic conditions due to poor maintenance of sanitation facilities and irregular solid waste collection	The HPKVN will carry out maintenance of the toilets at COE and carry out the regular collection and disposal of wastes to a designated waste treatment site. The solid waste disposal will be integrated with the Wahnaghat town waste disposal system. Septic tanks will be maintained and regularly emptied.	Maintenance schedule of COE building and facilities created	COE Operation and Management Team	HPKVN	Every Quarter	HPKVN
3	Natural Disasters	Necessary procedures to be followed by the visitors, COE staff and trainees during the natural disasters shall be written at prominent locations.	Warnings of disasters by Meteorological Department	District Administration	COE Operation and Management Team	During Disasters	Government of Himachal Pradesh
4	Waste from operation and maintenance of solar PV Cell	The supplier of Solar PV cell will collect any waste generated on account of operation and maintenance for possible	Waste generated from operation and maintenance of	Supplier and Operator of Solar PV Cell	COE Manager	As per schedule of maintenance	Fee of Solar PV Cell Supplier

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Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		recycle/reuse/disposal as operations will be maintained by the supplier.	Solar PV Cell				
5	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	The COE Manager will prepare onsite emergency plan for possible minor accidents and mishaps for operational phase. For natural calamities, the disaster management plan prepared by DOTE will be followed.	Onsite Emergency plan document and Disaster Management Plan document	Manager COE	HPKVN	Mock Drills every quarter	COE operation cost

C. Environmental Monitoring Plan

90. Environmental monitoring will be undertaken during construction at three levels. The Environment and Social Safeguards Specialists of the PMC will ensure that IEE and EMP are updated after completion of detailed design by the contractor and its approval by HPKVN. These PMC staff will also coordinate between PWD to ensure that all the provisions of the EMP are being adhered to by the contractor. Relevant staff from the PWD will monitor the contractor and ensure that the EMP and all of GOHP's rules with respect to the environment, and handling of solid and liquid waste are being followed.

91. To ensure the effective implementation of mitigation measures and EMP during construction and operation phase of the COE, it is essential that an effective Environmental Monitoring Plan be followed as given in **Table 17**. The proposed monitoring of all relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards and responsible agencies are presented in this table.

Table-11: Monitoring Plan for COE at Wagnaghat for Preconstruction, Construction and Operation Phases

Sl. No.	Field (Environmental Attribute)	Phase	Parameters to be Monitored	Locations	Frequency	Responsibility	Cost (INR/US\$)
1	Air Quality	During pre-construction phase	CO, NOx, PM ₁₀ , PM _{2.5} , and SO ₂	COE construction site	Once in the pre-construction phase (Before start of construction works) to establish baseline	Contractor , PWD, PMU, and HPKVN through approved Monitoring Agency	INR130,000/ US \$ 1900
		During Construction Phase			Once in every three months (except monsoon season) during construction phase (24 months construction phase)		
		Operation Phase			Once in season except monsoon season for initial 2 years		
2	Water quality	During pre-construction phase	All parameters specified in IS:10500 for drinking water	Ground water source close to COE site/ Drinking water at Construction camp/site	Once in pre-construction phase (Before start of construction works) to establish baseline	Contractor , PWD, PMU, and HPKVN through approved Monitoring Agency	INR130,000/ US \$1900
		During Construction Phase			Once in every three months (except monsoon season) during construction phase		
		Operation Phase			Once in season except monsoon season for initial 2 years		
3	Noise Levels	During pre-construction phase	Noise quality as per National Ambient Noise Standards on dB(A) scale (Leq (Day), Leq (Night), Lmax, and Lmin)	Noise levels at COE construction site	Once in pre-Construction phase (Before start of construction works) to establish baseline	Contractor , PWD, PMU, and HPKVN through approved Monitoring Agency	INR 39,000/ US \$ 600
		During Construction Phase			Once in every three months (except monsoon season) during construction phase		
		Operation Phase			Once in season except monsoon season for initial 2 years		

Summary of Site- and Activity-Specific Plans as per COE EMP

92. **Table-18** summarizes site- and activity-specific plans to be prepared as per EMP tables.

Table-18: Site- and Activity-Specific Plans/Programs as per COE Waknaghat EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Pre-Construction phase	Environmental monitoring program as per detailed design	Indicate sampling locations, methodology and parameters to the contractor	PMU, PIU, PMC and PWD	Contractor
Pre-Construction phase	List and maps showing utilities to be shifted	Utilities shifting	PWD during preliminary design and pre construction phase	Contractor
Pre-Construction Phase	Contingency plan for interruption of services	Mitigate impacts due to interruption of services during utilities shifting	Contractor(s)	Contractor
Pre-Construction	Chance find protocol	Address archaeological or historical chance finds	PMU and PMC	Contractor
Pre-Construction Phase	List of pre-approved sites for construction camp, stockpiles, and waste disposal sites	Location/s for construction camp, areas for stockpile, storage and disposal for minimization of impacts	PMC, PMU, PWD and PIU	Contractor
Pre-Construction phase	Waste/Spoil management plan	Mitigate impacts due to waste generation	Contractor	Contractor
Pre-Construction phase	Spill prevention and containment plan	Mitigate impacts of accidental spills of oil, lubricants, fuels, concrete, and other hazardous materials	Contractor	Contractor
Construction phase	Traffic management plan	Mitigate impacts due to transport of materials and project related traffic movement	Contractor	Contractor
Construction phase	Health and Safety (H&S) plan	To comply with IFC EHS Guidelines on Occupational health and safety	Contractor	Contractor
Construction phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion and vegetation removal at COE site	Contractor	Contractor
Construction Phase	Environmental Monitoring Plan Implementation	To check efficacy of mitigation measures	PMC, PMU, and PWD	Contractor
Operation Phase	Maintenance of sub-project sites landscape,	To maintain COE plantation and to carry out environmental	HPKVN	COE operation and management

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
	and plantation and environmental monitoring plan	monitoring to check environmental conditions at site		team

93. The guidelines for preparation of site specific traffic management plans have been provided in **Annexure-3**.

D. Capacity Building

94. In addition to the primary objective of skills enhancement of Himachali youth, the COE subproject will also raise awareness about environmental conservation amongst trainees, implementing agencies, and local communities. The project will have the opportunity to build capacity in environment protection for the above mentioned stakeholders.

95. The Environmental Specialists at PMC and safeguards cell at PMU will provide the basic training required for environmental awareness. Specific modules customized for the available skill set will be devised after assessing the capabilities of the members of the Training Program and the requirements of the project. The training would cover basic principles of environmental assessment and management; mitigation plans and programs, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in **Table 19** below.

Table-19: Training Modules for Environmental Management

Program	Description	Participants	Duration	Training Conducting Agency
A. Pre-Construction Stage				
Sensitization Workshop on Environment	Introduction to Environment: environmental assessment and social due diligence requirements in the project, Regulatory Clearances, and permission requirements in the project, and EMP Implementation, Introduction of ADB SPS 2009, and ADB Guidelines on Environmental considerations in planning, design and implementing projects	DTE, and officials, Environmental specialist of PWD and other Engineering staff associated with the sub- project, PIU staff and HPKVN PMU staff	½ Working Day	Environmental Specialist of the PMC
Session 1	Environmental impacts due to sub-projects in construction and operation phases, pollution generation activities during pre-construction and construction phases Environmental Management, Environmental Mitigation Provisions in the Contract, Implementation Arrangements, Methodology of Assessment Good engineering practices to be integrated into contract documents	All PIUs, HPKVN, and PWD Staff associated with COE Project	½ Working Day	Safeguards Specialist of the PMC

Program	Description	Participants	Duration	Training Conducting Agency
B. Construction Stage				
Session 2	Roles and Responsibilities- Roles and Responsibilities of Implementing Agencies officials, associated contractors and consultants towards protection of environment. Implementation. Arrangements for EMP and Environmental Monitoring during construction phase	Engineers and staff of line departments of the Government of GOHP, PIUs, PMC, PMU and HPKVN	½ Working Day	Safeguards Specialist of the PMU and PMC
Session 3	Monitoring and Reporting System	Engineers and staff of implementing agencies , and PMU/PIU (including the ES)	¼ Working Day	Safeguards Specialist of PMU and PMC

DOUD = Department of Urban Development, ES = Environment Specialist, HPKVN= Himachal Pradesh Kaushal Vikas Nigam Limited, PIU = Project Implementation Unit, PMC = Project Management Consultant, PMU = Project Management Unit, PWD = Public Works Department.

E. Environmental Budget

96. Most of the mitigation measures require the contractor to adopt good site practices, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Only those items not covered under budgets for construction are included in the IEE budget. The IEE costs include mitigation, monitoring and capacity building costs. The summary budget for the environmental management costs for COE is presented in **Table 20**.

Table-12: Environmental Management and Monitoring costs (INR)

Monitoring Component	Rate	Amount (INR)	Source of Fund
Pre-Construction and Construction Phase			
Air Quality - one location at COE site(where construction works are in progress), thrice a year (one sample pre construction and 6 samples during construction phase; total 7 samples)	10,000	70,000	Contractor
Water Quality- One ground water sample or drinking water sample from COE construction site, thrice a year (one sample pre construction and 6 samples during construction phase; total 7 samples)	10,000	70,000	Contractor
Noise Quality-One location at project site (where construction works are in progress), thrice a year (one sample pre construction and 6 samples during construction phase; total 7 samples)	3000	21,000	Contractor
Training for Capacity Building of stakeholders	Covered in the consultancy cost of PWD and PMC		
Total Construction Phase Monitoring Cost (A)		161,000	Contractor

Monitoring Component	Rate	Amount (INR)	Source of Fund
O & M Phase			
Air Quality -one location at completed COE Building, thrice a year at each location, for initial 2 years (3 samples per per annum, total 6 samples)	10,000	60,000	Operation cost of COE
Water Quality -one ground water sample COE building site, thrice a year at each location, for initial 2 years (3 samples per annum, total 6 samples)	10,000	60,000	Operation cost of COE
Noise Quality- one location at completed COE building, thrice a year at each location, for initial 2 years (3 samples per per annum, total 6 samples)	3000	18,000	Operation cost of COE
Total O&M Phase Monitoring Cost (B)		138,000.00	Operation cost of COE
Total Cost (A+B)		299,000.00	
Contingencies @ 5 %		14,950.00	
Total Budgeted Cost (INR)		313,950 (Say 350,000)	

F. Environmental Monitoring and Reporting

97. The PMU with the assistance of PMC will monitor and measure the progress of EMP implementation during construction phase. During operation phase PMU safeguard cell will take care of EMP implementation. PWD environmental cum social expert will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. PWD will submit monthly monitoring and implementation reports to PMU at HPKVN who will take follow-up actions, if necessary. PWD will also submit quarterly, semiannual and annual monitoring and implementation reports to PMU. The PMU will submit semi-annual monitoring reports to ADB. Monitoring reports will be posted in a location accessible to the public.

98. 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. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Process For Consultations Followed

99. The COE sub-project does not involve any elements, which could have an adverse impact on the community. There is no deprivation of any sort for the residents or displacement of any groups. Particularly, with regard to environmental impacts the sub-project can be characterized as innocuous.

100. In view of this, the need for holding a public hearing(as defined in EIA Notification 2006 of Government of India) is not perceived at this stage. However in compliance with the ADB's guidelines, focused public consultations were undertaken during the site visit at COE site. The local consultations were undertaken at Majhol village (near subproject site) and their views were obtained. During the preparation of this IEE, consultations have been held with the officials of Department of Planning, HPKVN, and Forest Department, DOUD, DORD and other stakeholders such as DoTE.

101. The process of consultations was taken up, as an integral part of the COE design and environmental assessment, in accordance with ADB Guidelines and following objectives:

- To educate the general public, specially potentially impacted or benefited communities, individuals and stakeholders about the proposed COE activities;
- To familiarize the people with technical and environmental issues of the proposed COE for better understanding;
- To solicit the opinion of the communities and individuals on environmental issues and assess the significance of impacts due to the proposed development;
- To foster co-operation among officers of EA and IAs, the community and the stakeholders to achieve a cordial working relationship for smooth implementation of the sub- project and
- To identify the environmental issues relating to the proposed activity.

102. During the consultations local residents opined that there is need to develop skills of local youth as there are limited employment opportunities in the state. The sub-project building construction will lead to infrastructure creation for skill development. They demanded fast implementation of the sub-project. The dates of consultations and stakeholders consulted have been summarized below in **Table 21**. The views, comments and suggestions of stakeholders and their incorporation in project design are presented in **Tables 22 and 23**. The records of consultations (list of participants with signatures) and consultation photographs are given in **Annexure- 4**.

Table-13: Dates and Stakeholders Consulted

Sl. No.	Stakeholders Consulted	Dates of Consultations
1	Himachal Pradesh Forest department	23 December 2015
2	Department of Rural Development, Department of Labor and Employment and Department of Higher Education	21 December 2015, May 10, 2016
3	Himachal Pradesh Pollution Control Board	23 December 2015
4	State Department of Environment, GOHP, HPKVN and DOP	14 and 15 March 2016
5	Department of Technical Education, GOHP	12 December 2015 and, 16 and 17 March 2016
6	Local stakeholders at Majhol village	02 July 2019

103. It is clear that most of the suggestions of stakeholders have been taken care in the project design.

Table-14: Views, Comments, and Suggestions of Stakeholders at sub-Project Sites and Addressed in Project Design

Sl. No.	Place	Date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
1	COE Site (Majhol Village)	02/07/2019	With local residents close to site HPKVN and GoHP Revenue officials	COE proposal, project benefits, implementation schedule, environmental and social impacts during project implementation, etc.	<ol style="list-style-type: none"> 1. Participants welcomed the project and told the consultants and HPKVN officials that project is good for the region and should be implemented fast. 2. One participant suggested that there is water availability issue in the area. The project should take care of water availability during construction and operation phases. The consultant replied that water availability shall be ensured through PHED supply. The suggestion is noted and will be taken care during project design and implementation. 3. One participant suggested that course related to horticulture and agriculture produce should be taken up in the COE as there is significant production of vegetables and fruits in the Solan district. The consultants replied that courses for the COE are being planned and this suggestion will be considered. 4. One participant suggested that since site is almost barren so plantation in the open space should be taken up to avoid erosion and increase greenery in the complex. The environmental specialist replied that as part of detailed design landscaping and tree plantation plan will be prepared. This plan will be implemented. 5. One participant suggested that locals should be given preference in the employment during construction. The consultant replied that after mobilization of the contractor, the workforce will be mobilized, at that contractor will employ the locals on merit. But, there will be indirect employment opportunities for supply of materials, transportation, accommodation, etc.. 6. Environmental specialist enquired from locals weather there extreme weather conditions such as floods, snowfall, etc. in the subproject. The locals replied that snowfall is not regular. It is occasional and there is no flooding issue.

Table-15: Summary of Stake Holder Consultations at Institutional Level

Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
1	Shimla, 23/12/2015	Conservator Forest Cum Nodal Officer CAMPA, State Forest Department	Clearances, permissions and No Objection Certificates (NOCs) - requirements from the State Forest Department and suggestions for the project	<ol style="list-style-type: none"> 1. The ADB Environment and Social Safeguards consultant briefly explained the project concept to the state department officials. 2. It was informed by the officials that for any site falling under forest land, clearance is required either under the 'Forest (Conservation) Act, 1980 or under the 'Schedule Tribe and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. 3. For vocational training purposes, GOHP can give clearance up to 1.0 hectare land. If application is submitted under the Forest (Conservation) Act, 1980, then the net present value (NPV) of the land and cost for compensatory forestation are to be paid by the State Government. 4. If the application is submitted under Forest Rights Act 2006, then for educational institutes, payment of NPV and compensatory afforestation costs are exempted for the land up to 1.0 hectare. The clearance can also be issued at Divisional Forest Officer level. 5. The Forest Officials suggested that application may be made under Forest Rights Act for faster clearance if any site falls under the forest. 6. The ADB Environmental consultant assured everyone that sites on forest land will not be considered to the extent feasible. However, under unavoidable situations, applications for clearances will be submitted as suggested. 7. The land transfer for Women's Polytechnic at Rehan in Kangra district is also completed. The land has been transferred by the revenue department in the name of DOTE.
2	Shimla, 23/12/2016	Senior Environmental Engineer, Himachal Pradesh Pollution Control Board	Clearances and Permissions required from Himachal Pradesh Pollution Control Board (HPPCB) and Department of Environment	<ol style="list-style-type: none"> 1. The ADB Environmental consultant provided an overview on HPSPDP. 2. He enquired about the types of permissions and clearances required from the HPPCB and State Department of Environment. <p>The senior Environmental Engineer, Department of Environment, replied that educational and training institutes are exempted from the environmental clearance process. Therefore, there is no</p>

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Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
				<p>requirement for prior environmental clearances for CLCs, RLCs, MCCs and the Women's Polytechnic planned under HPSDP. He explained that Consent to establish and Operate has to be obtained from HPPCB only if a residential complex is planned at any of the sites. In case hazardous waste is generated, then a management proposal has to be submitted to the HPPCB for Hazardous waste authorization and disposal.</p> <p>The ADB Environment and Safeguard consultant replied that none of the planned training facilities will generate hazardous waste, either during construction or operation.</p>
3	Sunder Nagar, 22/12/2015, 14/03/2016, and 15/03/2016	Director, DOTE, and other officials	ITI selected for up gradation, locations of RLCs and CLCs selected at ITI campus and site of proposed Women Polytechnic at Rehan in Kangra district	<ol style="list-style-type: none"> 1. The ADB Environment and Safeguard consultant enquired whether any of project sites under DOTE are planned in forest areas or within buffer or core zones of national park or bird sanctuary. Director, DOTE, replied that CLC/RLC sites planned are within the vacant sites within the premises of existing industrial training institutes. Only the site for the Women's Polytechnic in Kangra falls within revenue forest land. For this site NOC from Forest Department has been received. 2. The ADB Environment and Safeguard consultant suggested that DOTE should submit land ownership details/revenue records for all sites planned under the ADB funding for due diligence. He noted that DOTE should also start the process of getting NOC from the Forest Department and land transfer in DOTE name for the site in Rehan, Kangra, where the Women's Polytechnic is planned.
4	Shimla, 21/12/2015	Department of Labor and Employment (DOLE)	Locations of MCCs planned, approximate area required for MCCs	<ol style="list-style-type: none"> 1. The ADB Environment and Safeguard consultant enquired about the proposed locations of MCCs. The officials replied that with ADB assistance, 11 MCCs planned. The planned locations are Hamirpur, Shimla, Bilaspur, Kullu, Dharamsala, etc. As per Government of India guidelines, the built up area of around 3,000 sq.feet is needed for MCCs. 2. The ADB Environment and Safeguard consultant noted that the revenue record of land ownership should be provided to the ADB team for due diligence.

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Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
5	Shimla, 21/12/2015	Department of Rural Development (DoRD)	Locations of proposed RLCs, environmental and social safeguard issues, tree cutting, etc.	<ol style="list-style-type: none"> 1. The ADB Environment and Safeguard consultant enquired about probable locations of RLCs planned. 2. The environmental expert suggested that no sites with temporary or permanent occupation should be identified and revenue records showing ownership details should be provided for the social due diligence. Further, any site involving tree cutting, necessary tree cutting permission should be obtained. 3. The environmental expert also suggested that sites should be at least 300 m away from buildings/monuments of heritage importance and those declared as protected monuments by the State Archaeological Department or by the Archaeological Survey of India (ASI). The officials noted the suggestions.

B. Future Consultation And Information Disclosure

104. To ensure continued public and stakeholder participation in the sub-project life cycle, periodic consultations and focus group discussion shall be continued. A grievance redressal committee will be formed within the PIU (at PWD). The committee is already exists at PMU Level to register grievances of the people regarding technical, social and environmental issues. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the design and implementation process.

Information disclosure

105. Electronic version of the IEE will be placed in the official website of the HPKVN, HPKVN and the website of ADB after approval of the documents by the GOHP and ADB. On demand, any person seeking information can obtain a hard copy of the complete IEE document by paying cost of photocopy from the office of the PMU and PIU, on a written request.

106. The PMU will issue notification on the disclosure mechanism through display board at construction site. This display board will provide details of subproject components, cost and implementation duration such as start and completion dates.

C. Grievance Redress Mechanism

107. The affected person(s)/aggrieved party can give their grievance verbally or in written to the local site office of sub-project. Grievances of affected person will first be brought to the attention of the site in charge, who can resolve the issue at the site level. If the matter is not solved within 7 days period by the site in charge, it will be brought to the Grievance Redress Committee constituted for the purpose in PIU (PWD). This GRC shall discuss the issue in its monthly meeting and resolve the issues within one month of time after receiving the grievance. If the matter is not resolved by GRC at PIU level within stipulated time, it shall be referred to GRC at PMU level by Project Manager of PIU.

108. GRC at PMU shall discuss the issue and try to resolve it and inform the PIU accordingly. If the matter is not resolved by the GRC at PMU level within one month of time the matter will be referred to State Level Empowered Committee (SLEC), who will resolve the complaint within one month. However, the aggrieved person/party can bring the matter to the Court of Law any time after filing the complaint either at PIU level or PMU level. The PIU and sub-project site office shall keep records of all grievances received including contact details of complainant, date of receiving the complaint, nature of grievance, agreed corrective actions and the date these were affected and final outcome. For this a complaint register will be maintained at each sub-project site. The grievance redress process is shown below. The cost for functioning of Grievance Redress Mechanism will be accounted for in project cost as part of PMU or PIU functioning.

109. Further, person(s) / aggrieved party who are, or may be, adversely affected by the subproject may submit complaints to ADB's Accountability Mechanism. The accountability mechanism provides an independent forum and process whereby people can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected person(s) / aggrieved party should first make a good faith effort to solve their problems by working with the ADB South Asia operations department including the India Resident Mission.

Composition and functions of GRC

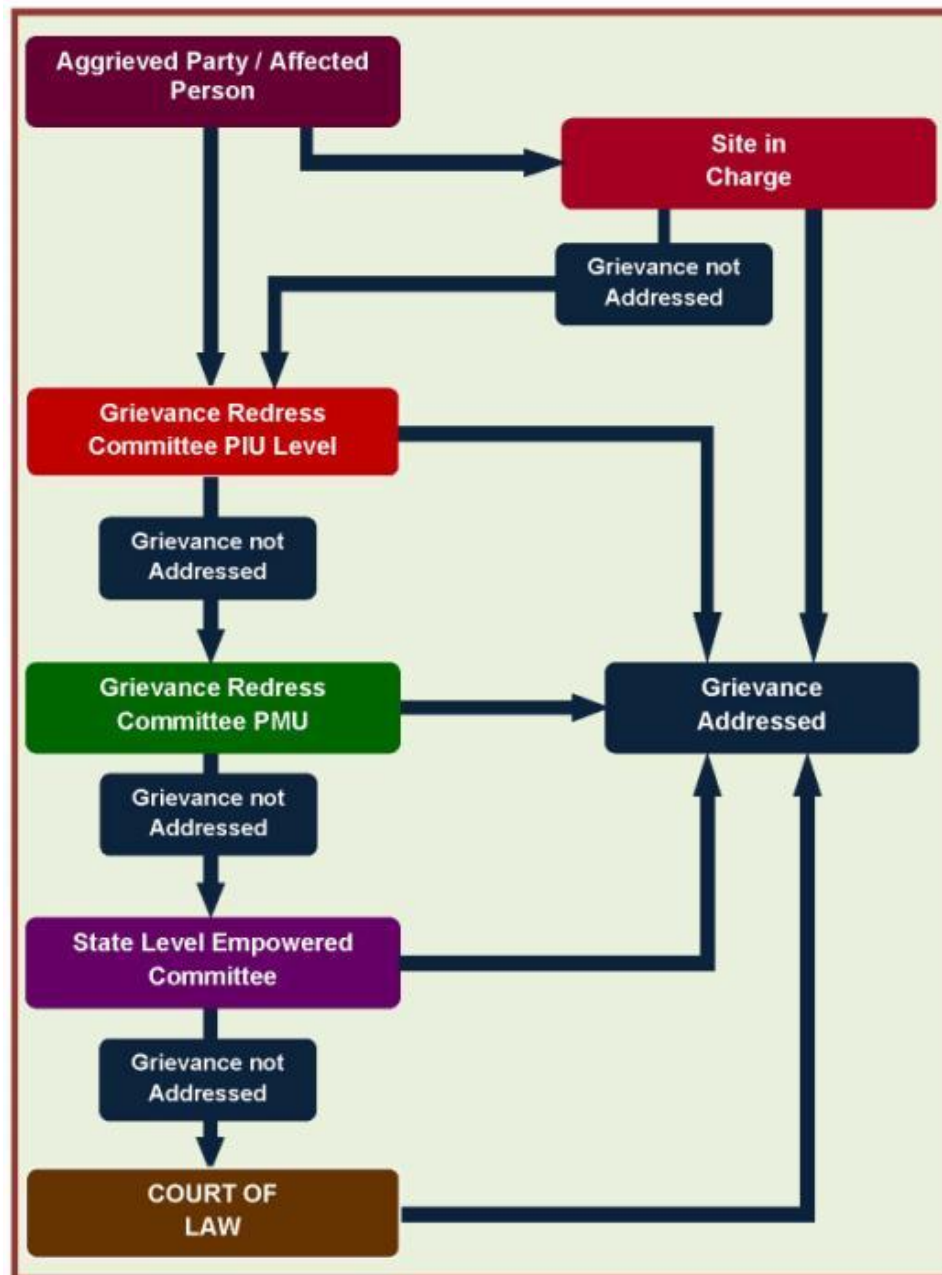
110. **PIU Level Grievance Redress Committee (GRC- PIU)** – This committee will comprise of Project Manager, Site In charge and one officer from contractor team. The GRC- PIU will be headed by Project Manager (PIU). It will meet at least once a month. The agenda of the meeting will be circulated to all the members and the affected persons/aggrieved party along with venue, date and time at least a week prior to the meeting. The matters shall remain with GRC at PIU level for one month. If the grievance is not resolved within this time period, then it will be referred to GRC at PMU.

111. **GRC at PMU.** There shall be one GRC in PMU. The matters not resolved by the GRC at PIU level within one month shall come under GRC at PMU. GRC at PMU will include the Managing Director, HPKVN, and Project Manager PIU (PWD) Head quarters, safeguard specialists (Environmental and Social) of the PMU, and one representative from concerned Department (DOTE/DOLE/DOHE/DOUD/DORD). The Committee shall be headed by the Managing Director, HPKVN. This committee shall look into the matters, which are referred to and not resolved by GRC at PIU level. If the matter is not resolved by the GRC at PMU level within one month of time, then the aggrieved person or party can bring the matter to State Level Empowered Committee (SLEC) which is in-charge of the overall HPSDP. In case grievance is not readdressed by the SLEC, then complainant can reach to the court of law. It may also be mentioned that aggrieved party / or person is free to reach court of law any time.

112. **Approach to GRC.** Affected person or aggrieved party can approach the GRC for redress of his/their grievances through any of the following modes:

- Web based: A separate corner will be developed at the HPKVN website so that public and affected person can register their complaints in the online column.
- Telecom based: A telephone number will be displayed at the web site of HPKVN and the construction site (s) sub projects so that general public can register their complaint through telephone and mobile phone to the PIU and PMU office. One complaint register will also be maintained at sub-project
- Construction site. The grievance redress mechanism for the HPSDP for safeguards related issues has been shown below in **Figure-12**:

Figure 12: Grievance Redress Mechanism (HPSDP Project)



VII. FINDINGS AND RECOMMENDATIONS

113. The components of the proposed COE subproject do not involve any interventions in and around the natural and cultural heritage destinations and have less significant (direct and indirect) environmental impacts. It is expected that the proposed sub-project will enhance economic growth and employability of local Himachali youth through development of skills.

114. 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-projects execution. The overall environmental quality of sub-project surroundings will not be affected as a result of operating the COE as adequate sanitation facilities have been planned.

115. 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 supplemented by the technical expertise of Safeguards Specialists of the PMC. Further, the environmental monitoring plans provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages.

VIII. CONCLUSIONS

116. On the basis of the IEE, it is expected that the proposed COE sub-project components have only minor, localized, temporary and insignificant environmental impacts. These can be easily mitigated through adequate mitigation measures and regular monitoring during the design, construction and post construction phases. Negative impacts on water, air quality and noise levels during civil works & operation phase, which will be appropriately monitored and adequately mitigated. This report has not identified any comprehensive, broad, diverse or irreversible adverse impacts caused by the sub project. Based on the findings of the IEE, the classification of the sub-project as Category “B” is confirmed. No further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009).

ANNEXURE-1: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

India/ Supporting Skill Development in Himachal Pradesh

SAHS

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following areas?			As part of HPSPDP, there is proposal to establish a COE at Wakanaghat near Majhol village. The COE site is in an open rural area near Majhol village. This COE site is located beyond 15 km distance from the (a) core and buffer zones of national parks, sanctuaries, tiger reserves, and biosphere reserves, etc. There are no structures or monuments of archaeological importance within an aerial distance of 300 m from the COE site.
▪ Underground utilities		√	The proposed COE site is a GOHP owned vacant plot near Wakanaghat town of Solan district. The site is open and vacant. So there are no underground utilities at this plot.
▪ Cultural heritage site		√	No cultural heritage site within 15 km distance from the COE site.
▪ Protected Area		√	No protected areas within 15 km distance from the COE site.
▪ Wetland		√	There is no wetland within 15 km aerial distance from the COE site.
▪ Mangrove		√	Since COE site is not close to coast or creek so there is no question of mangroves close to the site.
▪ Estuarine		√	The COE site is not close to sea, so not close to estuary.
▪ Buffer zone of protected area		√	The COE site is not within or close to buffer zone of protected areas.
▪ Special area for protecting biodiversity		√	There are no special areas for protection of biodiversity close (within 15 km distance) to COE site.

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Screening Questions	Yes	No	Remarks
▪ Bay		√	The COE site is Hilly State of Himachal Pradesh. This is not close to Bay.
B. Potential Environmental Impacts Will the Project cause...			
▪ Encroachment on historical/cultural areas?		√	The COE site is beyond 300 m distance from archaeologically protected historical and cultural areas.
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		√	The COE site is at a distance more than 15 km from the notified protected areas of Himachal Pradesh.
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems?		√	The sanitation facilities will be self-sustained (septic tanks planned as part of toilet blocks) and solid waste collection and disposal will be integrated with the Wagnaghat town waste disposal facilities or a new site for waste disposal will be identified.
▪ Dislocation or involuntary resettlement of people?		√	The COE site is in the possession and ownership of GOHP DOTE so there are no Involuntary Resettlement issues.
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact anticipated as site is encumbrance free and is not source of livelihood of poor and vulnerable group. There are no indigenous people Solan district and in particular in Wagnaghat town.
▪ Accident risks associated with increased vehicular traffic, leading to loss of life?		√	The proposed COE site is at a distance of 6 km from National Highway and connected with wide 2 lane road from the National Highway. Since built up area of COE building is 12560 m ² , therefore, traffic increase during construction will be insignificant. During operation also traffic increase is not anticipated as students will be local and hostel facilities are planned both for students and faculty. However, to rule out any accident due to project related vehicular traffic, if required, flagmen will be deployed near the COE construction site to regulate the traffic. Traffic Management Plan will be prepared for the construction phase.

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Screening Questions	Yes	No	Remarks
▪ Increased noise and air pollution resulting from increased traffic volume?		√	Since increase in the traffic is not anticipated, therefore, no increase in air and noise pollution is expected. Further, site being away from habitation and in open area, any minor noise on account of construction activities will be on no consequence.
▪ Occupational and community health and safety risks?		√	The COE construction and operational activities will not cause any occupational and community health and safety risks.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		√	No such risks are anticipated
▪ Generation of dust in sensitive areas during construction?	√		No generation of dust during the operation phase. Minor dust generated during construction activities will be controlled through dust suppression measures and through implementation of Environmental Management Plan (EMP).
▪ Requirements for disposal of fill, excavation, and/or spoil materials?	√		The proposed site for COE is located in undulating terrain. No filling is required. The cut and fills will be balanced to the extent possible. However, any excess cut and spoils generated will be disposed off at the identified disposal site. The site for disposal will be identified during the construction phase.
▪ Noise and vibration due to blasting and other civil works?		√	No blasting is planned. The noise due to construction activities will be controlled within the stipulated limits through implementation of EMP.
▪ Long-term impacts on groundwater flows as a result of needing to drain the project site prior to construction?		√	There is no requirement for draining of water from the COE site as site is in an undulating terrain so there is no accumulation of any storm water COE site. The site being in hilly state and of small size (<13,000 m ²) so impacts on ground water movement are not anticipated.
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?		√	The proposed built up area of COE is 12560 m ² and this small area will not cause any impact on local hydrology. Further, COE site being in an open area away from any river or natural stream, so there are no impacts on local hydrology.

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Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		√	<p>Since COE building to be constructed is of small in size, so construction force will not exceed 50 at any point of time. The construction workers will be mainly locals so no influx in anticipated during the construction.</p> <p>During operation phase, all trainees and faculty will be accommodated in Hostels planned, so no influx and impacts on social infrastructure are anticipated.</p>
<ul style="list-style-type: none"> Social conflicts if workers from other regions or countries are hired? 		√	<p>Preference will be given to locally available labor. The construction activities are limited in nature. In case workers are hired from other regions, requisite awareness programs and consultations with the locals will be organized to avoid social conflicts.</p>
<ul style="list-style-type: none"> Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation? 		√	<p>Since proposed COE building is new, the safety measures are being planned in the building design as per national and state level requirements.</p>
<ul style="list-style-type: none"> Risks to community health and safety caused by management and disposal of waste? 		√	<p>During construction phase waste collection and disposal system will be planned by the contractor and it will be approved by the implementing agency (PWD). For operation phase adequate provisions have been made in the building design to take care disposal of waste water and other solid waste generated. The waste disposal will be integrated with the local disposal systems.</p>
<ul style="list-style-type: none"> Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 		√	<p>The proposed COE site is in an open area and away from habitations. Specific community risks are not foreseen due to operations as such. The COE site has good connectivity through National and State Highways. The COE building is being designed following applicable seismic coefficient for Himachal Pradesh to build safety in structural design. There will be periodic maintenance of buildings during the operation phase.</p>

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions		Score	Remarks ⁶
Location and Design of project	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?	0	The proposed COE building is planned in open land, away from river and streams and not likely to be affected by floods, drought, storms and landslides.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?	0	Not Applicable
Materials and Maintenance	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)?	0	Weather conditions at proposed COE site do not demand usage of any specific construction material to counteract weather phenomenon.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	No, weather conditions at selected site do not require specific scheduling for maintenance.
Performance of project outputs	Would weather/climate conditions and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Not Applicable

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

⁶ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Result of Initial Screening (Low, Medium, High): Low Risk

Other Comments: None

Prepared by: Shreeniwas Verma, Environmental Safeguard Specialist

**ANNEXURE-2: LAND RECORDS CERTIFIED BY THE REVENUE DEPARTMENT
OFFICIALS SHOWING GOHP OWNERSHIP**

ANNEXURE-3: SAMPLE TRAFFIC MANAGEMENT PLAN

A. Principles

1. Since the scale of construction work at the sub-projects site is relatively small, there will not be any major or prolonged disruption of local traffic. Nevertheless, it is good to prepare a traffic management plan (TMP) to minimize and avoid public inconvenience to the extent feasible. This indicative TMP will ensure the safety of all the road users along the work zone and minimize public inconvenience. It addresses the following issues:

- (i) The safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- (ii) Protection of work crews from hazards associated with moving traffic;
- (iii) Avoiding traffic congestion and
- (iv) Maintenance of access to adjoining properties.

B. Operating Policies for TMP

2. The following principles will help to promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- (i) Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- (ii) Inhibit traffic movement as little as possible.
- (iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- (iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- (v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- (vi) Keep the public well informed.
- (vii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

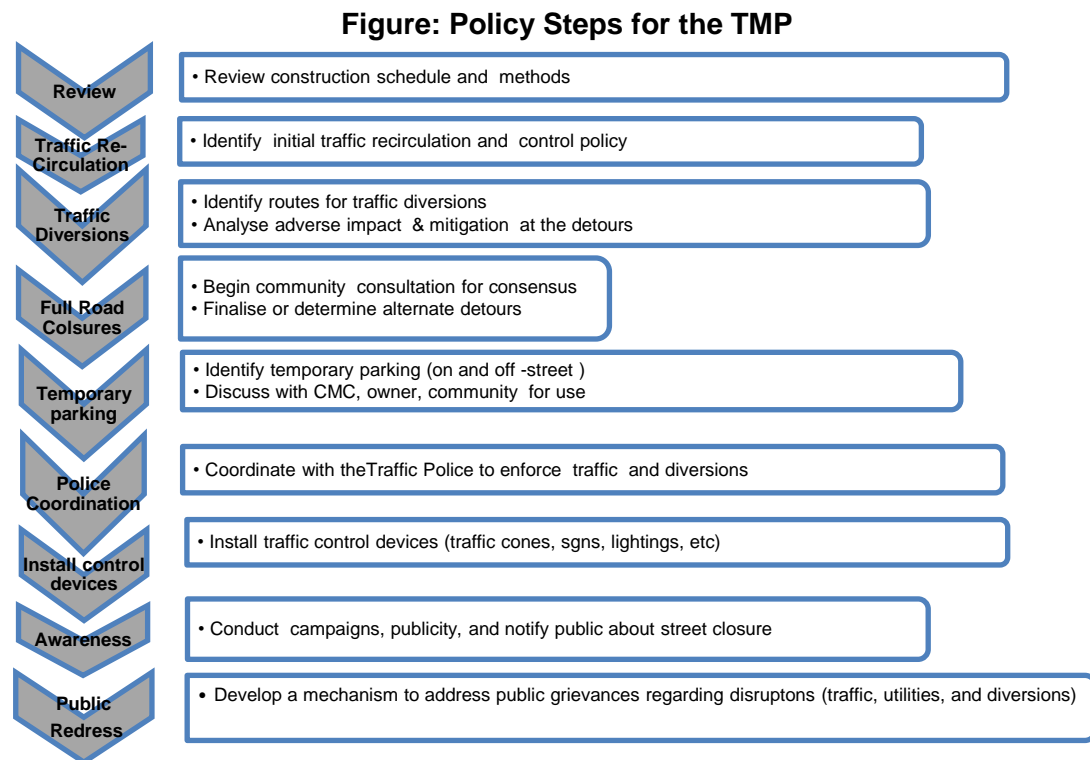
C. Analyze the impact due to street closure, if required

3. A final decision to close a particular street and divert the traffic should involve the following steps:

- (i) approval from the PIU and local administration to use alternative local streets as detours;
- (ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- (iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- (iv) determining if additional traffic control or temporary improvements are needed along the detour route;
- (v) considering how access will be provided to the worksite;
- (vi) contacting emergency service, school officials, and transit authorities to determine if there is any effect on their operations; and

- (vii) Developing a notification program to keep the public informed. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

4. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour streets or public opposition, then full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning rush hour traffic.



D. Public awareness and notifications

5. The PWD and the contractors will issue timely notifications to inform the public about the following issues:

- (i) Road blockages and alternative routes along with the duration (as applicable)
- (ii) Traffic control devices placed around the construction zones (signs, traffic cones, barriers, etc.);
- (iii) Reduced speed limits to be enforced at the work zones and traffic diversions.

8. It may be necessary to conduct an awareness campaign on road safety during construction. It will target relevant groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractors' site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- (i) Explain why the brochure was prepared, along with a brief description of the project;
- (ii) Advise the public to expect the unexpected;

- (iii) Educate the public about the various traffic control devices and safety measures adopted at the work zones;
- (iv) Educate the public about the safe road user behaviour to emulate at the work zones;
- (v) Tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- (vi) Indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

10. A vehicle maintenance and safety program shall be implemented by the construction contractor(s). The contractor(s) should ensure that all the vehicles are in proper running condition, and comply with roadworthy and meet certification standards of GOHP. All vehicles should be in good condition and meet the pollution standards of Government of India and GOHP. The drivers will follow the special code of conduct and road safety rules of GOHP. They will ensure that all loads are covered and secured. Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is key for achieving the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices will be used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

12. The work zone should take into consideration, the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.


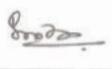
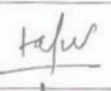
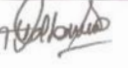






13. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers or personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

14. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There

should be provision for lighting beacons and illumination for night constructions. The PIU and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

ANNEXURE-4: ATTENDANCE SHEETS AND PHOTOGRAPHS OF CONSULTATIONS

Attendance Sheet of the meeting held on 18-3-2016 at 11.00 AM in Conference Hall Yojna Bhawan, Shimla-2 with ADB consultants regarding Himachal Pradesh Skill Development Project.

Sr. No.	Name of the Officer and Designation	Mobile No. / e-mail address.	Signature
1	Krishan Sharma Deputy Dir Employment	94184-50437 dde-lep-hp@nic.in	
2	Dr. D.K. Sharma, Sr. Engr. Engineer	9418027098 pcbseeshima@gmail.com	
3	Dr. H.K. Gupta, IFS Chief Scientific Officer Deptt. of Science & Technology	9418020469 hemantgifs@gmail.com	
4	Dr. Umesh Pathania Technical Officer & Estate Officer State Council Science Tech & Engr. & DEST.	9418310231 umeshpathania@red-mat.com	
5	Dr. Bhuram Sharma, Project Director HPSEEM. Deptt. of Rural Develop (H.P.)	94186-70325 bhramhp@gmail.com	
6	SN Verma ADB Consultant Environment	0984224458 stundia@gmail.com	
7	Rajesh Kumar IFS	9418000751	
8	J. Balasubramanian Prominent	9600044487	
9	Basab Basu TVET Expert	7838577785	
10	DEEPAK ANGRA HOD(CE) DTE Sundernagar	9418107688 angradeepak@yahoo.co.in	

Attendance Sheet of Consultations at Majhol Village near COE Site

IND 49108-002: Supporting Skill Development in Himachal Pradesh
Stakeholder Consultations

Date : 02/07/2019

Location: COE Site Majhol Waknaghat

Planned Facility: COE & Skill Centre

S. No.	Name	Designation	Phone Number	Signature
1	Sh. Hardeep	Local Resident	8219395288	Hardeep
2	Sh. Ramesh Ram	"		Ramesh
3	Sh. Sita Ram	"	9816534402	Sita Ram
4	Sh. Ankush	"	8219955219	Ankush
5	Smt. Reeta Devi		7867550957	Reeta
6	Smt. Geeta			Geeta
7	Smt. Diksha		8219169495	Diksha
8	Sh. Himanshu Joshi	Architect	9805772880	Himanshu Joshi
9	Kapil Bhandari	HPKVO	9805772880	Kapil Bhandari
10	Shree Niwas Sharma	Co-ordinator	9811224438	Shree Niwas Sharma
11				
12				
13				
14				

Photographs of consultations at Majhol Village



View of Discussion with Locals at Majhol Village



Another View of Discussion about COE at
Majhol Village



Consultations with Locals at Majhol Village



HPKVN Officials Explaining Features of COE