DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)
Phase II

(Funded by World Bank)

UPPER WARDHA DAM
(PIC:MH09HH1319)

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT

April-2022

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ABBREVIATIONS AND ACRONYMS

AIDS	:	Acquired Immunodeficiency Syndrome
CA	:	Conservation Area
CCA	:	Culturable Command Area
COVID	:	Coronavirus Disease
CWC	:	Central Water Commission
DRIP	:	Dam Rehabilitation and Improvement Project
DSRP	:	Dam Safety Review Panel
E&S	:	Environment & Social
EAP	:	Emergency Action Plan
ESCP	:	Environmental and Social Commitment Plan
ESDD	:	Environmental and Social Due Diligence
ESF	:	Environmental and Social Framework
ESIA	:	Environmental and Social Impact Assessment
ESMF	:	Environment and Social Management Framework
ESMP	:	Environment and Social Management Plan
ESS	:	Environmental and Social Standard
ESZ	:	Eco-Sensitive Zones
GBV	:	Gender Based Violence
GCA	:	Gross Command Area
GIS	:	Geographic Information System
GRM	:	Grievance Redressal Mechanism
HIV	:	Human Immunodeficiency Virus
IA	:	Implementation Agency
IPF	:	Investment Project Financing
LMP	:	Labour Management Procedure
MCM	:	Million Cubic Meters
MDDL	:	Minimum Draw Down Level
MU	:	Million Unit
MW	:	Megawatt
MWL	:	Maximum Water Level
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PDO	:	Project Development Objective
PE	:	Physical Environment
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
RD	:	Rural Development
RET	:	Rare Endangered and Threatened
RFB	:	Request for Bids
SC	:	Scheduled Castes
SCADA	:	Supervisory Control and Data Acquisition
SEA	:	Sexual Exploitation and Abuse
SEAH	:	Sexual Exploitation Abuse and Harassment
SF	:	Screening Format

SH	:	Sexual Harassment
SPMU	:	State Project Management Unit
ST	:	Scheduled Tribes
WB	:	World Bank
WCD	:	Water Conservation Department
WQ	:	Water Quality
WRD	:	Water Resources Department

EXECUTIVE SUMMARY

Upper Wardha Dam Project, has proposed to undertake rehabilitation measures (structural, non-structural and instrumentation & electrical) under the proposed Dam Rehabilitation and Improvement Project (DRIP II) with a view to increase the safety and to strengthen dam safety management.

The Environment and Social Due Diligence has been conducted for decision-making on the sub-project with a view to identify, evaluate and manage the environment and social risks and impacts in a manner consistent with the World Bank ESF. ESDD has been carried out by studying the sub-project information and proposed interventions, assessing the magnitude of E&S risk and impacts with respect to key baseline data in immediate vicinity area. Stakeholder's consultations with communities living downstream/vicinity of the dam, could not be held in the current circumstances due to COVID19 and these shall be held as soon as situation is conducive for holding such consultations.

Activity wise environment and social screening has been carried out to identify risks and impacts to classify the sub-project based on risk level (low, moderate or substantial and high) and recommend commensurate plans/measures to meet identified risks and impacts.

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Fisheries, Physical Environment, labor and SEAH/GBV. Environment risks of air, water, noise, and resource use as well as social risks of labor civil work within the dam body and road work are Moderate. Similarly, environment and social risk of labor camp and disposal of debris has been identified as moderate.

Dam was constructed in 1993 and over a period of time and named Nal-Damayanti sagar No interventions are planned outside the dam area and no direct impacts envisaged on protected area, however, to eliminate the risks of indirect impact due to outside labor and transportation of man and material, risk of indirect impacts on natural habitat has been identified as moderate.

Risk of all other activities has been identified as Low. Hence the overall risk of this sub-project Dam is categorized as Moderate. OHS is a substantial risk activity and is being treated separately through OHS plan in accordance with WB ESHS guidelines. These risks are low to moderate and localized, short term and temporary in nature which can be managed with standard ESMP and guidelines.

Since risks and impacts are low to moderate category, a standard ESMP customized to sub-project will be prepared in accordance with the ESMF. The customized ESMP will address the following:

- Gender Based Violence or SEA/SH related actions (ESS1)
- Labor Management Procedure (ESS2)
- Resource Efficiency and Pollution Prevention (ESS3)
- Community Health and Safety (ESS4)
- Stakeholders Engagement Plan (ESS10)

Overall, the proposed activities within this dam sub-project have low to moderate risks resulting in the overall sub-project to be categorized as Moderate risk category. These risks and impacts can be effectively mitigated with effective implementation of mitigation plans by SPMU/IA, Contractors and monitoring by EMC, SPMU and CWC.

Chapter 1 INTRODUCTION

PROJECT OVERVIEW

The proposed Dam Rehabilitation and Improvement Project (DRIP II) would complement the suite of ongoing and pipeline operations supporting India‟s dam safety program. The project development objective (PDO) is to increase the safety of selected dams in participating States and to strengthen dam safety management in India.

Project Components include:

Component 1: Rehabilitation and Improvement of Dams and Associated Appurtenances (US$577.14 million);

Component 2: Dam Safety Institutional Strengthening (US$45.74 million);

Component3: Incidental Revenue Generation for sustainable operation and maintenance of dams (US$26.84million);

Component 4: Project Management (US$68.13 million);

Component 5: Contingent Emergency Response Component (US$0 million).

The project is likely to be implemented across many states in the country. The primary beneficiaries of the project are the communities that live in dam breach flood inundation areas and the communities that depend on water, irrigation and electricity services provided by the dams that could be compromised by poor dam performance or failure. In addition to saving lives, improved dam safety will avoid potential flood damage to houses, farm areas, infrastructure (roads, bridges, and other public and private infrastructure) and industrial and commercial facilities. Improved dam safety will also reduce the likelihood of service interruptions due to dam failure as well as potentially improving dam service provision, overall efficiency and storage capacity, including during drought periods.

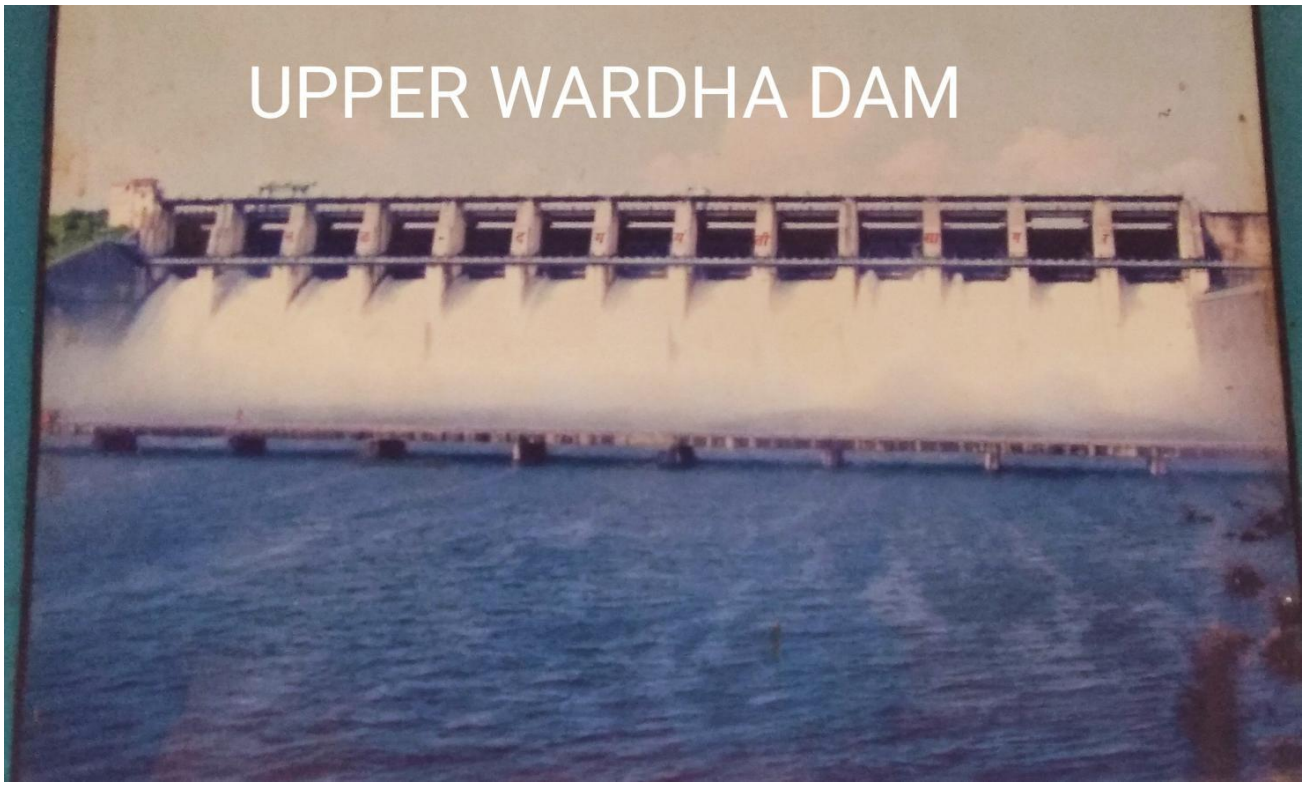
SUB-PROJECT DESCRIPTION – UPPER WARDHA DAM

Upper Wardha Project, a masonry & Earthen dam at Wardha River in the Godavari Basin was constructed in the year 1993 with main purpose of Irrigation and water supply to Amravati, Morshi, Warud, Ashti & 16 villages. The Upper Wardha Dam is the biggest masonry dam in Amravati region in Maharashtra with a height of 53.50 m above lowest river bed level. Length of dam is 5920.00 m. (Masonry Dam 331.50 m. & Earthen Dam 5588.50 m.) with gross storage capacity of 678.27 MCM and live storage capacity 564.05 MCM. This project is located at village Simbhora in Morshi Taluka of Amravati district in Maharashtra.

The project supplies industrial/domestic water to the tune of 168.456 MCM and Irrigation supplies to 104400 ha Gross Command Area (83,300 ha CCA).

Salient features of the project area are reported below:

Project	**Upper Wardha Multi-purpose Project**
River	Wardha In Godavari Basin
Lat/Long	21^{0} 16' 27"N / 78^{0} 03' 34" E
GCA	104400 ha
CCA	83300 ha
Annual industrial/domestic water supply	168.456 MCM
Hydro Power Generation	Nil
Catchment Area	4302 sq km
Main Dam	
Type	Masonry & Earthen Dam.
Length	5920 m (E/Dam 5588.50 m. M/Dam 331.50 m.)
Top elevation	346.50 m
Height of dam above lowest river bed level	53.50 m
Lowest river bed level	300.30 m
Spillway	
Type of spillway gates	Ogee Type spillway with radial gates.
Length	331.50 m (Over flow 241.50 m. & Non overflow 91 m.)
Location of spillway	Central spillway (Chain age 640 m to 972.50 m)
Crest level	330.50 m
Number of bays	13
Discharge capacity at MWL	19457 cumec
Size of spillway gate	15 m wide and 12 m high
Reservoir	
Maximum water level	343.50 m
Full Reservoir Level	342.50 m
MDDL	332.30 m
Live storage	564.05 MCM
Gross storage	678.27 MCM
Reservoir spread area	93.12 sq km
Year of start of construction	1978
Date of completion	1993
Year of first impoundment	2003



View of Dam

Proposed Interventions/ Activities and intended Outcomes

Dam Safety Review Panel (DSRP) constituted by CWC, Government of India has inspected and made a review of Upper Wardha dam on 8th January, 2020 and recommended measures to improve the safety and performance of dam and associated appurtenances in a sustainable manner, and also to strengthen the dam safety institutional set-up.

The objectives of the project are to be achieved through investments for physical and technological improvement activities, managerial upgrading of dam operations, management and maintenance, with accompanying institutional reforms. The project will improve the safety and operational performance of dam and mitigate risks to ensure safety of downstream population and property. The following rehabilitation proposals as described in the PST have been formulated based on the DSRP recommendations and these proposals form the basis for preparation of present ESDD report.

Structural Rehabilitation Works

1. Cleaning of V.P.D. of Upper Wardha Dam.
2. Resurfacing of Approach road to Upper Wardha Dam.
3. Construction of Barbed wire fencing & chain link fencing for protection of Upper Wardha Dam.
4. Repairs to staircase of lift cum staircase well of Upper Wardha Dam.
5. Repairs to Drainage system of cross drain & longitudinal drains of E/dam.
6. Repairs to staircase from section office to dam top.

Non-structural Measures

7. Railing on D/S left and right side guide walls of Upper Wardha Dam.
8. Surging & air jetting of Relief Well on D/S of dam.

Instrumentation, SCADA, Surveillance system, etc

9. Dam Instrumentation (Geo-technical, hydro-meteorological, Seismic, Geodetic, data collection, storage, data transfer, analysis, retrieval, Operation &Maintenance etc.).

Basic Facilities Enhancement

10. Construction of rest room at Upper Wardha Dam.
11. Construction of lavatory block at dam.
12. Electrical works.
13. Mechanical works.

Tourism/Fisheries/Hydropower Development

Nil

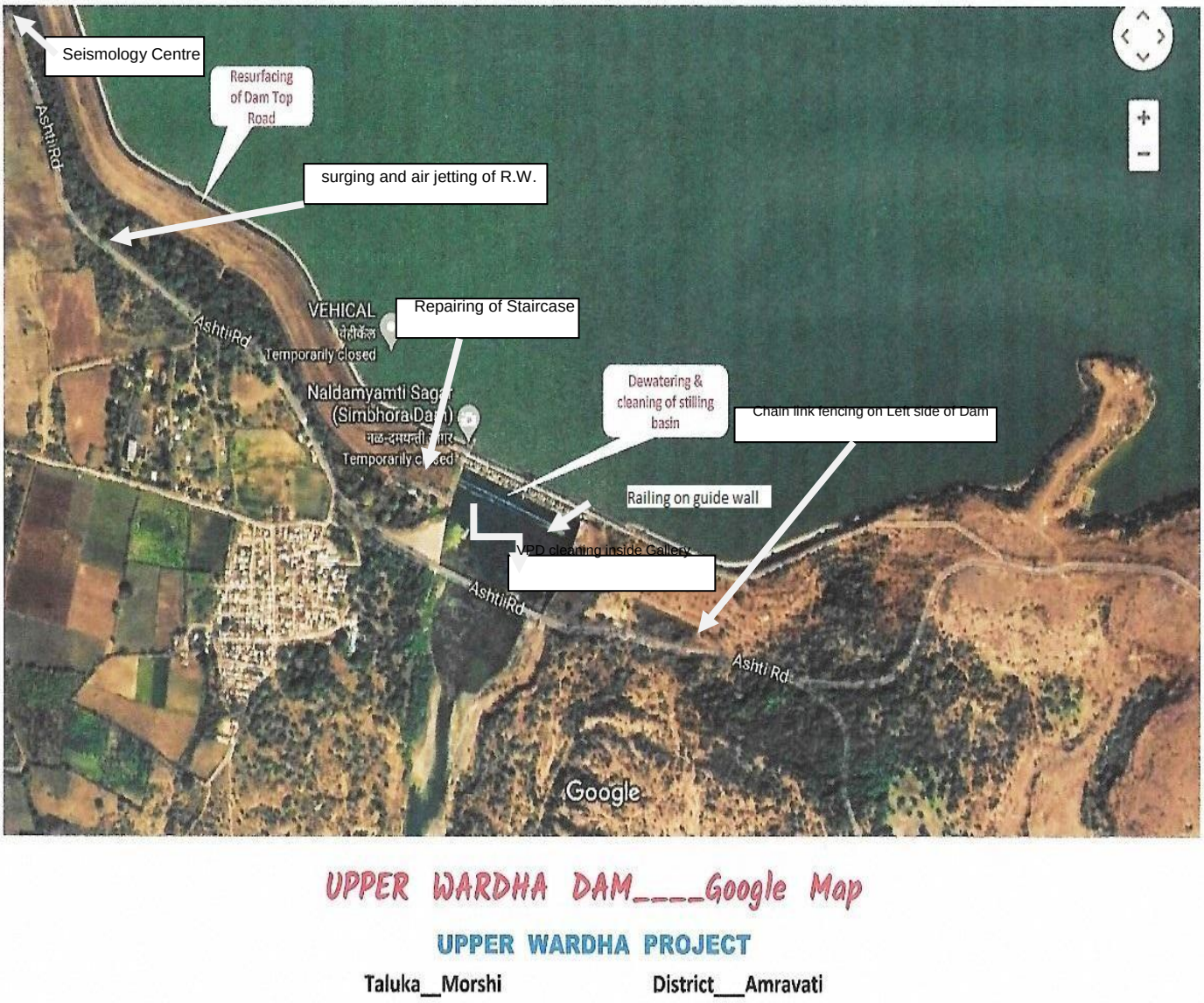
- *Present ESDD is based on the activities proposed in PST, if there is any change of activities in future, ESDD will be updated accordingly.*

Figure 1.1 provides photographs of key infrastructure proposed for rehabilitation works. Figure Show locations of major interventions marked on Google earth image. All the possible intervention locations, which can be marked on image are shown.

Inspection gallery cleaning of V.P.D

Re surfacing of road at dam top

Figure 1.1: Selected Photographs of Improvement/Intervention area



UPPER WARDHA DAM____Google Map

UPPER WARDHA PROJECT

Taluka__Morshi District___Amravati

Figure 1.2: Project Area showing major intervention locations

IMPLEMENTATION ARRANGEMENT AND SCHEDULE

As can be seen from the list of activities proposed under dam rehabilitation project; these activities can be divided into civil works main package, other package and instrumentation. Civil work will be carried out by contractor(s) as these are labor intensive activities and would be completed over a period of 36 months. SPMU will hire contractor(s) based on national open competitive procurement using a Request for Bids (RFB) as specified in the World Bank,,s—Procurement Regulations for IPF Borrowers, July 2016, (Revised August 2018 Procurement Regulations), and is open to all Bidders as defined in the Procurement Regulations. Following is the overall implementation and procurement schedule:

Overall Phasing of Project Implementation:
Proposed Starting of implementation (MM/DD/YYYY): 01/05/2022
proposed Ending of implementation (MM/DD/YYYY): 30/04/2024
Implementation Duration (months) (MM): 24 Months

Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	May 2022	April 2024	Estimate Sanctioned
2	Other Packages	May-2022	April 2024	Estimate Sanctioned
3	Procurement – instrumentation, goods, inspection vehicles	Yet to be decided		

PURPOSE OF ESDD

The overall project (DRIP II) was categorized as **Low Risk** as per the internal Environment and Social Risk Classification of the Bank. The Environment and Social Due Diligence has been conducted to use it as a tool for decision-making on the sub-project with the following specific objectives:

i. To identify, evaluate and manage the environment and social risks and impacts of the sub-project in a manner consistent with the ESSs;
ii. To adopt a mitigation hierarchy approach to the project's E&S risks i.e. a) anticipate and avoid risks and impacts; b) minimize or reduce risks and impacts to acceptable levels, if not avoidable; c) once risks and impacts have been minimized or reduced, mitigate; and (d) where significant residual impacts remain, compensate for or offset them, where technically and financially feasible;
iii. To help identify differentiated impacts on the disadvantaged or vulnerable, if any, and to identify differentiated measures to mitigate such impacts, wherever applicable;
iv. To assess the relevance and applicability of environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate; identify gaps, if any exist, and

v. To assess borrower's existing capacity, gaps therein, and identify areas for enhanced capacity towards management of E&S risks.

vi. Based on the categorization of Environment and Social risks and impacts of the Dam sub-project, to determine whether ESIA is to be carried out using independent third- party agency or a generic ESMP customized to mitigate E&S risks and impacts will suffice.

APPROACH AND METHODOLOGY OF ESDD

The following approach has been adopted for ESDD:

i. Study sub-project information, proposed interventions, their magnitude and locations and carry out assessment of each proposed intervention to identify the magnitude of E&S risk and impacts;

ii. Review relevance and applicability of national and state legal requirements and Bank's ESF policy, standards and directives and preliminary assessment of applicability of legal requirement and ESS framework (2-8)

iii. Conduct site visit to understand baseline environment and social settings, proposed activities under the sub-project, their location and sensitivity, if any.

iv. present key baseline data essential for impact assessment in immediate vicinity area of proposed interventions from secondary sources, such as land-use, protected areas in vicinity, ascertain presence of indigenous (schedule tribe)/vulnerable people, etc.

v. Undertake institutional assessment to identify existing capacities & relevant gaps to manage E&S risks and impacts

vi. Conduct preliminary stakeholder consultations to help identify potential stakeholders; to provide information on the proposed interventions; to identify issues and concerns; and ascertain appropriate mechanisms for continued engagement

vii. Carry out activity wise environment and social screening and identify risks and impacts. Classify the sub-project based on risk level (low, moderate or substantial and high) and recommend commensurate plans/measures to meet identified risks and impacts.

Consultations with communities living downstream/vicinity of the dam, could not held in the current circumstances due to COVID and these shall held as soon as situation is conducive for holding such consultations.

Chapter 2 INSTITUTIONAL FRAMEWORK AND CAPACITY ASSESSMENT

POLICY AND LEGAL FRAMEWORK

India has well defined environmental and social regulatory framework. The regulation applicability depends on nature of work and location of work. Broadly legislation can be divided into four categories viz environmental, forests, wildlife conservation and social. The applicability analysis of regulations pertaining to all the above four categories was carried out. The applicability of World Bank ESF comprising, 10 ESSs (ESS1 to ESS10) to the proposed rehabilitation proposals and Standard specific requirements were analyzed. Further, a comparison of national environmental and social regulations versus World Bank's ESS has been carried out along with the gap analysis. Applicability of Indian regulations, World Bank's ESS along with comparison and gap analysis is discussed in ESMF.

Central Water Commission, Ministry of Jal Shakti, Government of India has prepared "Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects" and is under publication as a guiding document for the dam owners to systematically address in advance the environmental safeguard requirements and have discussed in detail all applicable legal requirement. Reference has been drawn from this document as well, while carrying out applicability analysis.

Indian environmental regulation requiring environment clearance is for new dam projects specifically for the purpose of hydropower generation and/or irrigation projects and varies with generation capacity for hydropower projects and culturable command area served by irrigation projects. Forest related clearances become applicable, if new or any modification in any existing project requires diversion of forest land for non-forestry purposes. Wildlife Clearance process gets triggered if the project is in proximity to protected area or activities are proposed within protected or conservation areas.

Therefore, for the proposed dam rehabilitation activities at Upper Wardha dam, regulatory clearances will not be applicable as per Indian regulation. Other applicable regulatory requirement is discussed in ESMF.

DESCRIPTION OF INSTITUTIONAL FRAMEWORK

The sub-project will be implemented by Water Resources Department (Amravati Region), Maharashtra. The geographical area of the state is divided into 5 river basins viz. Krishna, Godavari, Tapi, Narmada and narrow basin of west flowing rivers of Konkan.

Water Resources Department (Amravati Region), Maharashtra, who will be responsible for implementing the project, is headed by Executive Director with Principal Secretary being the overall head of Water Resources Development.

The planning & development of irrigation facilities in the State is entrusted with Water Resources Department (WRD) and Rural Development & Water Conservation Department (RD & WCD).

WRD is entrusted with survey, planning & design, construction & management of major, medium and minor projects having Cultural Command Area (CCA) 250 ha and more. Whereas, survey, planning, construction & management etc. of minor projects below 250 ha. CCA is entrusted to RD & WCD.

WRD Maharashtra does not have in-house expertise to address E&S issues. Presently, Project Director at SPMU and Executive Engineer at dam level look after these aspects.
Presently, no formal system is established for dealing with external complaint or a formal GRM exclusively at Water Resources Department, Maharashtra. Though, there is a Grievance Redressal Portal of Government of Maharashtra (https://grievances.maharashtra.gov.in/en) which provides the details (contacts/email) of nodal officer and Head of Water Resources Department under Officer's contact. There is no internal complaint committee as per Sexual Harassment Act either at dam level; however, such complaints can be made to the head of the department. Executive Engineer, Upper Wardha Dam Division is Head of Grievance Redressal Mechanism within the department to address any kind of grievance / complaints by general public.

Chapter 3 ASSESSMENT OF AND SOCIAL

Assessment of physical, ecological and socio-economic conditions at dam site and immediate surrounding has been carried out based on secondary information and site observations; as discussed below.

PHYSICAL ENVIRONMENT

Land Use/ Land Cover

The project surrounding area land use and environmental sensitivity was analyzed using GIS techniques. Land use/ land cover map within 5 km radius of dam is presented at **Figure 3.1**. As can be seen from the map, present land use upstream of dam is water body (reservoir), on downstream side along both the banks there are agricultural area, evergreen/semi-evergreen forests and scrub land. However, as discussed under Chapter 1 about project description, the project activities will be confined to dam body only and no structural interventions are proposed beyond existing dam boundaries. Four villages are falling in 5 km radius on downstream of dam namely – Simbhora, Belora, Khambit, Pardi.

N

LULC Class	Area (Sq.Km)	LULC Class
Builtup,Urban	4162.99	Builtup,Rural
Builtup,Mining	363.67	Agriculture,Crop land
Agriculture,Plantation	5785.16	Agriculture,Fallow
Forest,Evergreen/ Semi evergreen	6556.67	Forest,Deciduous
Forest,Forest Plantation	235.27	Forest,Scrub Forest
Forest,Swamp/ Mangroves	294.61	Barren/unculturable/ Wastelands, Salt Affected land
Barren/unculturable/ Wastelands, Gullied/Ravinous Land	494.94	Barren/unculturable/ Wastelands, Scrub land
Barren/unculturable/ Wastelands, Sandy area	18.98	Barren/unculturable/ Wastelands, Barren rocky
Wetlands/Water Bodies, Inland Wetland	16.34	Wetlands/Water Bodies, Coastal/Wetland
Wetlands/Water Bodies, River/Stream/canals	3954.95	Wetlands/Water Bodies, Reservoir/Lakes/Ponds

Figure 3.1: Land Use and Land Cover Map of 5 km radius around Dam site

Natural Hazards

Potential of natural hazards such as flooding and earthquake is not significant. As per BIS 11223-1985 criteria, Upper Wardha Dam is a large dam. And Spillway is designed for capacity of 19457 cumec. (P.M.F. (Probable Maximum Flood) as per old flood review is 23315 cumecs) while the revised design flood calculated by CWC comes to 20143 cumec. Which is less than previous flood review by C.D.O.?

This Project falls in earthquake zone III, hence is no revision carry out and at the time of dam design it had been taking into consideration. Zones, viz. Zone II, III, IV and V. Zone II are the least active and Zone V is the most active. In case, of any natural disaster, emergency response will be as per dams emergency management plan and district disaster management plan; contractor will be made aware of this so that he can take necessary precautions and ensure workers awareness.

PROTECTED AREA

Nearest Protected Area

No protected area or eco sensitive zone near dam. No permission or clearance would be required to carry out any of the proposed rehabilitation work at Upper Wardha Dam.

SOCIAL ENVIRONMENT

The Upper Wardha Dam is located at village Simbhora in Morshi Taluka (Tahsil) of district Amravati in the state of Maharashtra. The proximity villages/urban areas i.e. villages/urban areas which fall within 5 km distance from dam on downstream side, these are Simbhora, Belora, Khambit and Pardi. Submergence of dam is 93.12 Sq. Km. Spread in Amravati, Wardha & Nagpur district. D/S of dam left bank is in Wardha district & Right bank is in Amravati district.

The project area does not fall within the Schedule V[1] areas of Maharashtra.

The brief demographic characteristic of the **Amravati** district is given in the table below:

No. of Households	**644,922**	**Household Size**	**04**
Total Population	**2,888,445**	**Population (0-6 age)**	**313457**
Male	1,480768	Boys (0-6 age)	162011
Female	1,407,677	Girls (0-6 age)	151446
Sex Ratio	951	Sex Ratio (0-6)	934
Population (SC)	**506,374 (17.53%)**	**Population (ST)**	**404,128 (13.99%)**
Male	259,398	Male	205,834
Female	246,976	Female	198,294
Literates	**8,227,161**	**Literacy Rate (in %)**	**87.38**
Male	4,591,396	Male	**91.46**
Female	3,635,765	Female	**83.10**
No. of Workers	**1,236,322**	**Cultivators**	198,793 (16.08%)
Male	837,577	**Agricultural Labors**	667,943 (54.03%)
Female	398745	**Household Industrial Workers**	20998 (1.70%)
No. of Main Workers	**1,061,544**	**Other Workers**	348,588 (28.20%)
No. of Marginal Workers	**174,778**		

The project area does not fall within the Schedule V areas of the state. Though there are Scheduled Tribe households in the downstream areas, there are no physical interventions planned in the downstream areas. The ST households are mainstreamed in the area and do not possess any characteristics as outlined in ESS7. These areas and the ST households will be taken into account during the preparation of Emergency Action Plan for Upper Wardha Dam.

CULTURAL ENVIRONMENT

As per list of National Monuments in Maharashtra and list of State Protected monuments in Maharashtra; there are no protected monuments in and around dam site i.e. within 10 km radius of dam site.

[1] **Scheduled Areas** are **areas** in India with a preponderance of tribal population subject to a special governance mechanism wherein the central government plays a direct role in safeguarding cultural and economic interests of **scheduled** tribes in the **Area.**

Chapter 4 ACTIVITY WISE ENVIRONMENT & SOCIAL SCREENING, RISK AND IMPACTS IDENTIFICATION

SUB-PROJECT SCREENING

The subproject screening is undertaken following a three step screening methodology as described in ESMF. Process of risk/impacts identification is done using screening process considering the proposed interventions at each dam as provided in the Project Screening Template using first screening format (SF-1). Applicable interventions are further classified based on their location i.e. within dam area or outside the dam area. Each activity is reviewed for the applicability under-sub project, location of applicable activity and likely risks and impacts. The SF-1 format is used to ascertain the types of E&S risks for each of the proposed rehabilitation activity e.g. Risk/Impact on Water Quality, Fisheries, Conservation Area, Protected Area, Ecology, Occupational Health, Physical Environment, Cultural Environment, Tribal Presence, Private Land/Assets/Encroachers/Squatters, Labor, Migrant Labor and GBV risks – each of these corresponding to the ESS 2-8.

The second format (SF-2) is used to assess the extent of risk/impact intensity for each of the identified E&S risk and is used to categorize the risk level as Low/Moderate/Substantial/High. Finally, using a third E&S risk summary format (SF-3), the risk categories for all different types of E&S risk and impacts is summarized and the highest of the risk categories is assigned as overall risk category for the given Dam sub-project. Based on the above findings, the ESDD report recommends Risk category of the Dam sub-project – whether it is Low/Moderate/Substantial/High and types of instruments that need to be prepared as part of the ESMP along with the responsibilities and timelines.

Outcome of three stage screening exercise is discussed below.

Step I Screening (using Form SF-1): Sub-Project Component, Construction Support Preparatory Intervention related vs. Nature of risk/impact

Screening indicated that all project components related activities are limited to within the dam area/premises. Due to nature of these activities, likely impacts will be on physical environment in terms of air pollution, noise pollution and waste generation. None of the proposed structural interventions involve acquisition of private land and/or private assets. These activities in no way cause restriction on access to land or use of resources by local communities and there is no economic displacement envisaged due to the sub-project. Activities interfacing with water bodies – river/reservoir will have risk of spillage of construction material and debris leading to water pollution and impacts on fishes. Although no intervention is planned outside the dam.

Pre-construction and construction stage major auxiliary or preparatory intervention are within dam area as well as beyond dam area. Deployment and haulage of heavy machinery, setting up of workshop, operation of concrete mixture and heavy pumps will be within dam area. Other activities such as labor camp and debris disposal will be beyond dam area. Activities involving machinery and equipment will have OHS risks and impacts on physical environment. Transportation of material, debris disposal and labor camp are likely to generate pollution and impact on physical environment.

Project will involve project managers and supervisors, contracted workers – these would also include migrant workers as all the required labor will not be fully supplied locally for a number of reasons, such as worker unavailability and lack of technical skills and capacity. Construction contractors are expected to stay at/near dam, set up construction equipment and machinery near work location at pre-determined/approved sites. Influx of skilled migrant labor, albeit few in numbers, for construction works is likely. The labor will stay inside the dam premises, hence risk of SEA/SH is low.

Proposed non-structural interventions such as Emergency Action Plan, Early Warning System and Flood Forecasting System, etc. During implementation of these interventions, project will reach out to the disadvantaged and vulnerable persons and groups. During implementation of EAP, population in vulnerable areas under different release scenario will be identified and contacted through public consultation meetings. Communities will be made aware about the warning systems and do's and don'ts during such scenarios.

Output of this screening is enclosed as **Annexure I**.

Step II Screening (using Form SF-2): All applicable activities identified as having potential risks/impacts that were identified through Step I screening, are further screened for associated sub-activity and evaluated for the extent of risk. Sub-activity's Risk/Impact intensity is further categorized as Low (L), Moderate (M), Substantial (S) or High (H) based on following criteria:

Low : Localized, temporary and negligible
Moderate : Temporary, or short term and reversible under control
Substantial : Medium term, covering larger impact zone, partially reversible
High : Significant, non- reversible, long term and can only be contained/compensated

Each activity may have different type of risks/impacts and magnitude of separate risk may vary, as analyzed under SF2. In SF2, each proposed rehabilitation activity is assessed for the nature of risk on various components of environment and social (based on SF1, Column 5) and then each one of these is separately evaluated for level of risk as Low, Moderate, and Substantial or high; the highest risk level is recorded in column 5 of SF2 for each activity.

Occupational Health and safety: OHS is a substantial risk activity in almost all cases and is not being considered under screening criteria. Occupational health and safety is considered an important requirement of every project irrespective of size and type of the projects. It will be part of Contractor's ESMP.

Analysis of extent of risk/impact for sub-activities resulted in identification of most of the activities proposed as Low risk, except for following which have been assessed as having Moderate Risk/impact.

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- Cleaning of V.P.D. pipes in gallery.
- Railing on D/s left & right guide walls.
- Repair to staircase of lift cum staircase well of Upper Wardha Dam.
- Supply & installation of Digital seismograph.
- Repair to drainage system of cross drain and longitudinal drain of E/Dam.
- Resurfacing of approach road at dam top, section office & left bank head regulator of Upper Wardha Dam.
- Repair to staircase from section office to dam top.
- Construction of barbed wire fencing & chain link fencing.
- Construction of Rest room at dam.
- Construction of Lavatory block at dam.
- Providing, installation & commissioning of instruments.
- Mechanical Works.
- Electrical works.

None of the activities for this sub-project is having substantial or high risk. The outcome of Screening is enclosed as **Annexure II**. In case of GBV/SEAH, this site was assessed as Low risk.

Step III Screening (using Form SF-3): This is one of the important screening templates which bring out the risks identified in the SF-2. These risks are distributed in to environmental and social risks to complete a matrix to bring out a complete scenario of risks and their classification in a matrix format. Any of the activity comes an H or S will make the sub project a high risk sub project and will undergo a detailed ESIA. Low to moderate will prepare Standard ESMP.

Based on consideration of all the above, summary of Risk/Impact in SF-3 for major sub-project activities is given at Table 4.1 below.

Table 4.1: Summary of Identified Risks/Impacts in Form SF 3

Project Activity	Environment Risks						Social Risks					
	Air, water, noise, land use, Soil, Resource use	Pollution down stream and upstream	General Ecology	Protected Area (Wild Life Sanctuaries, National Park and other natural habitat even if not protected)	Other RET species (flora and fauna) outside protected areas	Fish and Aquatic life within dam water body	Land	Tribal	Labour	Cultural heritage	GBV/ SEAH	OH and Safety to Labour/ Community
Civil (within Dam Boundary)	M	L	L	None	None	L	L	L	L	L	L	M
Electro Mechanical	L	L	L	None	None	L	L	L	L	L	L	M
Instrumental SCADA, surveillance	L	L	L	None	None	L	L	L	L	L	L	L
Painting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road work	M	L	L	None	None	L	L	L	M	L	L	M
Safety measures (Siren, Lighting)	L	L	L	None	None	L	L	L	L	L	L	L
Major debris disposal	L	L	L	None	None	L	L	L	L	L	L	L
Labor camps	L	L	L	None	None	L	L	L	M	L	L	L
Major Civil Work like Additional Spill Way	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Hydraulic Structure (tunnelling)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Civil Work extending beyond Dam Area Like training Structure	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Additional activities for Tourism /Solar/Fisheries/ Water recreation enhancement	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA

Criteria for Risk Evaluation:
Low: Localized, temporary and Negligible
Moderate: temporary or short term and reversible under control
Substantial: medium term, covering larger impact zone, partially reversible
High: significant, non-reversible, long term and can only be contained/compensated
Occupational Health and safety: OHS is a substantial risk activity in almost all cases and is being treated separately through OHS plan in accordance with WB ESHS guidelines and shall be applicable to all sub-projects. Hence is not being considered under screening criteria.

STAKEHOLDERS CONSULTATION

In light of the COVID 19 pandemic, Government of India has announced a country wide lockdown between March 23 till May 31, 2020, that constrained holding of consultation meetings. Large Public gatherings are not permitted even today during the Unlock phase. So, stakeholders meeting was held on dated 22/03/2021.

DESCRIPTIVE SUMMARY OF RISKS AND IMPACTS BASED ON SCREENING

Based on the above screening analysis, potential impacts and risks from the sub-project are summarized below:

Environmental Impacts and Risks

1. Environment risks and impacts, as assessed above, for various project activities under this sub-project are categorized as Low and Moderate due to localized nature of proposed activities i.e. activities remain limited to dam area except for lab our camp and muck/debris disposal.
2. Execution of civil and hydro-mechanical work within dam body will generate localized impacts on physical environment and resource use
3. Impacts of renovation of approach road, fencing work, cross drainage structure to road have identified as moderate due to nature of work and pollution potential on physical environment and social risk due to labor involvement.
4. Construction and demolition waste and muck require careful disposal at pre-identified and approved site to minimize the risk of pollution on this count.
5. There is no wild life century falls under Dam area, there is not any impact on general ecology is envisaged. Hence no need to prepare Biodiversity Conservation Plan.
6. Rehabilitation work would require labor to work on various sections of dam involving working at height, working in confined spaces, working on reservoir side, etc; Further, workers will also be exposed to dust and noise and will have to handle chemicals/gases for some of the works; these will lead to occupational health and safety risks.

Social Risk and impacts

1. As the interventions are within the dam premises and on the dam structure, there shall be no adverse impacts on land and assets due to any sub-component or sub-activities
2. The dam is not located in the Schedule V area. Though are Scheduled Tribes households in the vicinity, these are mainstreamed into the overall society and do not meet the characteristics outlined in ESS 7. There will be no physical interventions outside the dam. There will not be any harm while performing any operation under DRIP II.

3. Number of migrant labor will be low as these works require only few but very skilled labors. These workers will mostly operate from labor camps within the dam premises/proximity and hence there would be minimal interface with communities and therefore significantly lower SEAH/GBV risks.
4. Waste generation from labor colony can pollute drinking water sources of community; risk is low and can be mitigated by providing adequate sanitation facilities.
5. No impacts are envisaged on cultural heritage as works shall not be undertaken in their vicinity or result in any impact.
6. Labor related risk would include:
   - Safety issues while at work like injuries/accidents/ fatalities leading to even death, while at work; Occupational health and safety risks due to exposure of workers to unsafe conditions while working at heights, working using lifts, handling of equipment and machinery, exposure to air and noise pollution etc. will be addressed through OHS guidelines.
   - Short terms effects due to exposure to dust and noise levels, while at work
   - Long term effects on life due to exposure to chemical /hazardous wastes
   - Inadequate accommodation facilities at work force camp, including inadequate sanitation and health facilities
   - Sexual harassment at work
   - Absence or inadequate or inaccessible emergency response system for rescue of labor/workforce in situations of natural calamities.
   - Health risks of labor relating to HIV/AIDS and other sexually transmitted diseases
   - Non-payment of wages
   - Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
   - Unclear terms and conditions of employment
   - Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
   - Denial for workers" rights to form worker's organizations, etc.
   - Absence of a grievance mechanism for labor to seek redressal of their grievances/issues

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Risk Classification

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Fisheries, Occupational Health, Physical Environment, labor and SEAH/GBV. The summarized environmental and social risks of identified activities with level of risk is presented in previous chapter These risks are low to moderate and localized, short term and temporary in nature which can be managed with generic ESMP and guidelines. Environment risks of air, water, noise; land use, soil and resource use for most of the activities as well as social risks of labor and OHS to labor/community are Moderate. Environment risks of pollution downstream and upstream along with that of fish and aquatic life are categorized as Moderate for grouting works due to interface with water bodies. Environmental risk relating to Labor camp has been flagged as Moderate on environment.

Hence the overall risk of this sub-project Dam is categorized as Moderate. OHS is a substantial risk activity and is being treated separately through OHS plan in accordance with WB ESHS guidelines.

National Legislation and WB ESS Applicability Screening

The applicability analysis of GOI legal and regulatory framework indicates that while, there are various legislations which will have to be followed by the contractor for the protection of environment, occupational health and safety of workers and protection of workers and employment terms. None of Indian legislation is applicable warranting obtaining clearance prior to start of construction/improvement work.

In addition to overarching ESS1, Four ESS standards are found relevant to this sub-project as per reasons given in **Table 5.1** below:

Table 5.1: WB ESF Standards applicable to the sub-project

Relevant ESS	Reasons for Applicability of the standard
ESS2: Labor and Working Conditions	Due to engagement of Direct worker, Contracted workers and Community workers (likely for EAP and other non-structural interventions) for rehabilitation work
ESS3: Resource Efficiency, Pollution Prevention and Management	Civil and hydro-mechanical work including resource consumption requiring protection of physical environment and conservation of resources
ESS4: Community Health and Safety	Transportation of material, and accidental risk during repair /improvement work and also leading to SEA/SH GBV risk
ESS10: Stakeholder Engagement Plan	For engagement of stakeholders in all structural and non-structural interventions e.g. Early flood Warning system, Instruments, seismograph, cctv cameras siren systems, broadcasting facilities, Emergency Action Plan etc.

RECOMMENDATIONS

Mitigation and Management of Risks and Impacts

Since risks and impacts are low to moderate category, a generic and standard guidance in accordance with the ESMF shall be followed. It shall cover the following aspects.

a. SPMU shall customize the generic Environmental and Social Management plan (ESMP) that has been provided in the Environmental and Social Management Framework (ESMF) and make it part of bid document for effective adherence by contractors.

b. ESMP shall provide due measures for labor management and protection of environment quality and resource conservation (during handling of resources) in line with ESF standard ESS2 and ESS3 respectively. Likewise, due attention has to be given to Occupational Health and Safety of workers and community in line with the requirements of ESS4 and World Bank Group guidelines on Occupational Health and Safety (OHS). Hence SPMU/IA shall customize the standard ESMP in line with outline provided in the ESMF and ensure its adherence by contractor. The customized ESMP will address the following:
    - Gender Based Violence or SEA/SH related actions (ESS1)
    - Labor Management Procedure (ESS2)
    - Resource Efficiency and Pollution Prevention (ESS3)
    - Community Health and Safety (ESS4)
    - Stakeholders Engagement Plan (ESS10)

c. Contractor shall submit BOQ as per ESMP of the sub project.

Mitigation plans to meet requirements for relevant Standards with responsibility and stages are given in **Table 5.2** below:

Table 5.2: List of Mitigation Plans with responsibility and timelines

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	• Gender Based Violence or SEA/SH related actions	SPMU/IA	Before mobilization of contractor
ESS2: Labor and Working Conditions	• Labor Management Procedure (LMP) including OHS management plan	SPMU/IA	Before mobilization of contractor
ESS3: Resource Efficiency, Pollution Prevention and Management	• Pollution Prevention and Environment Quality Management Plan (PPEQMP)	SPMU/IA	Before mobilization of contractor
ESS 4: Community Health and Safety	• Community Health and Safety Management Plan (CHSMP)	SPMU/IA	Before mobilization of contractor

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS 10: Stakeholder Engagement Plan	• Stakeholder Engagement Plan	SPMU/IA	By negotiation

ESDD and ESMP will be placed on the www.damsafety.in website as well as other accessible locations such as the office of Engineer in Charge at Dam site as well at SPMU for reference and record. These documents would be disclosed/disseminated through other appropriate means like Project meetings, workshops etc. Each IA will translate these documents in their local language, if required, and will upload in their respective websites and also make available at other accessible locations.

Institutional Management, Monitoring and Reporting

ESMP will be customized by SPMU/IA from standard ESMP included in ESMF of the sub project and shall be shared with CWC by SPMU for their review/endorsement and approval before including in the bid document.

Each IA shall designate Nodal Officer(s) (full time in-house engineering staff with E&S expertise) to coordinate and supervise E&S activities. They shall be at the level of Executive Engineer/ Deputy Directors and shall provide commensurate time to comply with E&S related activities. Brief TORs for these Nodal E&S officers is included in ESMF. The SPMU, in case in-house expertise not available, will hire the qualified staffs on need basis to support management of E&S risks including Environmental and Social Experts for ensuring compliance with the Bank's ESF and ESS‟s and ensuring that these activities shall be implemented as per the procedures.

SPMU/IA shall advise contractors about applicable legislative requirements and ensure that contractors prepare its own ESMP (C-ESMP) as outlined in ESMP for this sub-project and submit compliance reports to SPMU/IA on quarterly basis. SPMUs will share regular implementation status of ESMPs to CWC and The World Bank in line with ESMF on quarterly basis.

SPMU/IA shall establish and operationalize a grievance mechanism to receive and facilitate resolution of complaints and grievances, from the communities and other stakeholders including implementation partners. GRM works within existing legal and cultural frameworks and shall comprise project level and respective State level redressal mechanisms. Most Project related grievances could be minor and site-specific.

EMC (Engineering and Management Consultant) for the project will have sufficient staff with skills on Environment and Social aspects. Awareness raising and capacity building on the new Environmental and Social Framework (ESF) need to be carried out for the environment and social staff engaged and this will be an area of continued focus, with a view to generate awareness at to dam level. EMC will develop formats for regular supervision and monitoring on E&S issues and undertake site visits/

inspections of the dam sites to monitor for compliance; collate and review QPRs and set up a monitoring and reporting system on E&S issues.

Overall, the proposed activities within this dam sub-project have low to moderate risks resulting in the overall sub-project to be categorized as Moderate risk category. These risks and impacts can be effectively mitigated with effective implementation of mitigation plans by SPMU/IA, Contractors and monitoring by EMC, SPMU and CWC.

Annexure - I: Form SF1

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated with in dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries (F), Conservation area (CA), Protected Area (PA), Ecological (E), Occupational Health (OH), Physical Environment (PE), Cultural (C), Tribal presence (T), impact on private land/assets/encroachers/squatters (LA), Labour (L), GBV risks (G), (Write whichever is applicable)
1	**2**	**3**	**4**	**5**
A	**Nature of Project Component Related**			
1	Reservoir Desiltation	**NA**		
2	Major structural changes – Spillway construction (Improving ability to withstand higher floods including additional flood handling facilities as needed.)	**NA**		
3	Structural strengthening of dams to withstand higher earthquake loads	**NA**		
4	Structural Improvement/Repair work -upstream of Dam site (interfacing dam reservoir) (like Treatment on u/s face for reducing leakages, Upstream cement grouting of Dam body etc)	**NA**		
5	Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir) (like Downstream cement grouting of Dam body for reducing leakages, Strengthening of the dam buttress etc.)	**NA**		
6	Remodelling earth dams to safe, stable cross sections	**NA**		
7	Electro-mechanical activities with interface with dam reservoir	**NA**		
8	Electro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)	**A**	**DI**	**OH, WQ, L, G**
9	Instrumentation, General lighting and SCADA systems	**A**	**DI**	**OH, L**
10	Basic Facilities (like access road improvement, renovation of office, etc)	**A**	**DI**	**OH, PE, L, G**
11	Utility installation like standby generator, or setting up solar power systems	**NA**		
12	Painting Work	**NA**		
13	Water recreation activities	**NA**		

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated with in dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries (F), Conservation area (CA), Protected Area (PA), Ecological (E), Occupational Health (OH), Physical Environment (PE), Cultural (C), Tribal presence (T), impact on private land/assets/encroachers/squatters (LA), Labour (L), GBV risks (G), (Write whichever is applicable)
1	**2**	**3**	**4**	**5**
14	Tourism Development	**NA**		
15	Solar power/floating solar	**NA**		
16	List any other component not listed above			
i	Addition of Geo-membrane / Concrete cladding	**NA**		
B	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Acquisition of forest land involved	**NA**		
2	Taking of private land (including physical or economic displacement, impact on livelihood; temporary loss of business)	**NA**		
3	Major Borrow materials requirement involved	**NA**		
4	Major Quarry materials requirement involved	**NA**		
5	Blasting involved	**NA**		
6	Resettlement and Rehabilitation	**NA**		
7	Types of project workers (Direct, Contracted, Community Workers (or Volunteers i.e. for EAP implementation)	**NA**		
8	Labour Camps involved (location within dam premises or outside)	**A**	**DI**	**WQ, PE, L, G, E**
9	Migrant labour likely to be involved	**A**	**DI**	**G**
10	Heavy machinery to be deployed and related maintenance workshop set up involved	**A**	**DI**	**OH, PE, L, G**
11	Hot mix plant Requirement	**NA**		
12	Concrete mixture and heavy pumps to be deployed	**A**	**DI**	**OH, PE, L, G**
13	Temporary land acquisition involved	**NA**		
14	Temporary disruption to access, livelihoods	**NA**		
15	Tree felling/ vegetation clearance involved	**NA**		
16	Haulage of machinery involved	**A**	**DI**	**OH, PE, L, G**

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated with in dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries (F), Conservation area (CA), Protected Area (PA), Ecological (E), Occupational Health (OH), Physical Environment (PE), Cultural (C), Tribal presence (T), impact on private land/assets/encroachers/squatters (LA), Labour (L), GBV risks (G), (Write whichever is applicable)
1	**2**	**3**	**4**	**5**
17	Major Debris Disposal involved	**NA**		
18	Major Transport of materials involved	**A**	**DE**	**PE, L, G**
19	Utility shifting involved	**NA**		
20	Discharge of reservoir water (lowering of reservoir water involved)	**NA**		
21	**List any other not listed above**			

Annexure – II: Form SF2

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
A	**Project Component Related**			
1.	**Structural Strengthening/Improvement/Repair work -upstream of Dam site**			
a	No structural strengthening /repair work –Upstream of Dam site. Hence not applicable	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**NA**
b	NA	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	
c	NA	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	
d	NA	**WQ, OH, L**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	
e	NA	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	
2.	**Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir) (like repair of parapet walls, damage spillway crest, downstream training walls, etc.)**			
a	Cleaning of V.P.D pipes in gallery.	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **L** **S**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
b	Railing on D/S left & right guide walls.	**WQ, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **M** **L** **L**
c	Repair to staircase of lift cum staircase well.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**M** **L** **M** **L**
d	Supply & installation of Digital seismograph.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **L** **L**
e	Repair to drainage system of cross drain & horizontal drain of E/Dam.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **M** **L**
f	Resurfacing of approach road at dam top, section office, L.B.H.R.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **L** **L**
g	Repair to staircase from section office to dam top.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **M** **L**
h	Construction of barbed wire fencing & chain link fencing.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **L** **L** **L**
i	Construction of Rest Room at Dam.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk	**L** **M** **L** **L**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
l	Construction of Lavatory block at dam.	**OH, PE, L, G**	Air pollution, noise pollution, generation of construction debris, labor and GBV risk Occupational health and safety risk	**L** **L** **L** **L** **L**
3.	**Electro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)**			
a	Repair of steel ladder approach to gallery.	**WQ, F, OH, PE, L, G**	, Noise pollution, Occupational health and safety risk due to working at heights, waste generation from removed parts, Labor & GBV risk	**M** **M** **L** **L**
b	Electrical works	**OH, PE, L, G**	Occupational health and safety risk due to electrical work, waste generation from removed parts and packing material, Labor & GBV risk	**L** **L** **L**
c	CCTV Camera	**PE, L, G**	Waste generation from removed parts and packing material, Labor & GBV risk	**L** **L**
4.	**Instrumentation, General lighting and SCADA systems**			
a	Dam Instrumentation (Geo-technical, hydro-meteorological, Seismic, Geodetic, data collection, storage, data transfer, analysis, retrieval, Operation &Maintenance etc.).	**OH, PE, L, G**	waste generation from removed parts and packing material, labor and GBV risk	**L**
B.	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Types of project workers (Direct, Contracted, Community Workers (or Volunteers i.e. for EAP implementation)	**L, G**	GBV risk due to involvement of workers and local population	**L**
2	Labor Camp involved (location within dam premises or outside)	**WQ, PE, G**	Wastewater generation from domestic activities, waste generation, GBV risk within labor and involving community.	**L** **L** **L**
3	Migrant labor likely to be involved	**L, G**	Migrant labor having low	**L**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
			degree of interface with community	
4	Likely interface of Workers with communities	**L, G**	Risk of GBV due to labor interaction with community	**L**
5	Heavy machinery to be deployed and related maintenance workshop set up involved	**OH, PE, L, G**	Heavy machinery will be deployed for repair of road and for other activities – OH risk due to machine handling, waste, wastewater and air emissions from machines operations, hazardous waste generation from oil waste, Labor & GBV risk	**L** **M** **L** **L** **L**
6	Concrete mixture and heavy pumps to be deployed	**OH, PE, L, G**	Concrete mixture and pumps will be deployed for civil works and de-watering - OH risk due to machine handling, waste generation, wastewater and air emissions from operations, hazardous waste generation from oil waste, Labor & GBV risk	**L** **L** **L** **L** **L** **L**
7	NA			
8	Major Debris Disposal involved	**OH, PE, L, G**	Debris will be generated from various repair activities - OH risk during debris handling, air and noise emissions from debris handling and transportation, GBV risk due to labor involvement	**M** **L**
9	Major Transport of materials involved	**OH, PE, L,**	Material will be transported	**L**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
		G	from various vendors and suppliers to site for civil, hydro-mechanical work and instrumentation - - OH risk during material handling, loading and unloading; air and noise emissions from transportation, Labor and GBV risk	 L L

Criteria for Risk Evaluation :
Low : Localized, temporary and Negligible
Moderate : temporary, or short term and reversible under control
Substantial : medium term , covering larger impact zone, partially reversible
High : significant , non- reversible, long term and can only be contained/compensated
Occupational Health and safety: it will be treated as Moderate by default as OHS effect can be kept controlled and with negligible effect with adoption of defined guidelines,