DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)
Phase II and Phase III

(Funded by World Bank)

KANHER DAM

(PIC –MH09HH1141)

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT

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CA	:	Conservation Area
CCA	:	Culturable Command Area
COVID	:	Coronavirus Disease
DE	:	Beyond Dam Area
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
SH	:	State Highway
SPMU	:	State Project Management Unit
ST	:	Scheduled Tribes
VPD	:	Vertical Porous Drain
WB	:	World Bank
WCD	:	Water Conservation Department
WQ	:	Water Quality
WRD	:	Water Resources Department

EXECUTIVE SUMMARY

Kanher is Irrigation-purpose Project, has proposed to undertake rehabilitation measures (structural, non-structural, instrumentation and basic facility enhancement) 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; and conducting preliminary stakeholder consultations. Detailed 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, labour and SEAH/GBV. Environment risks of air, water, noise, and resource use as well as social risks of labour civil work within the dam body and road work are Moderate. Similarly, environment and social risk of labour camp and disposal of debris has been identified as moderate.

Dam was constructed in 1988 and there is no wild life century in dam vicinity area. 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 localised, 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 customised to sub-project will be prepared in accordance with the ESMF. The customised ESMP will address the following:

- Gender Based Violence or SEA/SH related actions (ESS1)
- Labour 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

1.1 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: Dam Safety Institutional Strengthening (US$45.74 million);
Component 2: Risk-informed Asset Management and Innovative Financing for Sustainable Operation and Maintenance of Dams (US$26.84 million);
Component 3: Rehabilitation and Management Planning for Dams and Associated Appurtenances (US$577.14 million);
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, 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.
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1.2 SUB-PROJECT DESCRIPTION – KANHER DAM

Kanher is Irrigation-purpose Project, a masonry dam at kanher Village on Venna river in the Krishna Basin, was constructed the year 1988 with main purpose of irrigation to Satara and Sangali District. The Kanher Dam is having height of 50.34 m above lowest river bed level. Length of dam is is 1955 m with gross storage capacity of 286.00 MCM and live storage capacity 271.68 MCM. This project is located at village Kanher Tal.Dist Satara. Approach road is existing and is within dam area the right of way already exists of bituminous but now it is damaged due to wear and tear, so no tree cutting is involved for road work.

The project Irrigates 41075 Ha Gross Command Area and produces 4 MW Hydropower .

Salient features of the project area are reported below:

Sr. No.	Item	Unit	Kanher Dam
1	**Name of Project**		Kanher
2	**Taluka**		Satara.
3	**District**		Satara.
4	**Location of site**		
a	River		Venna
b	Topo sheet No.		17G/14
c	latitude		17^0 45" 0'
d	Longitude		73 ^{0}55" 0'
5	**Details of Dam**		
a	Type of Dam		Earthen Dam with masonery gated spillway
b	Maximum height of Dam.	m	50.34m.
c	Length of Dam including spillway	m	1955m
d	Length of Earthen + masonary	m	1696.95 + 258.05
e	Total quantity of embankment	Tm^3.	6098.00
f	masonry .	Tm^3.	185.00
g	Concrete.	Tm^3.	33.50
h	Year of start of construction		1976-77.
i	Year of irst filling of reservoir		1986-87.
j	year of completion.		1988-89.
6	**Spillway.**		
a	Type of spillway		Ogee type
b	.Gated/Non gated.		Gated
c	Location.		785 m to 842 m.
d	Length	m	57.00 m.
e	Max flood discharge.	Cumecs.	1778 cumecs.
f	Flood lift (Max.)	m.	0.60 m.
g	Maximum height.	m.	8.20 m.
h	. Size and No. of gates.		12 x 8.50 m.(4 Nos.)
7	**Catchment Area.**	Sqkm	204.69 sqkm.

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 Kanher dam on 23 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.

1. Structural Rehabilitation Works:

A. Civil Works

i Reaming of vertical porous drains and re-drilling of foundation drains.

ii Providing Epoxy grouting treatment to Drainaige /Inspection Gallery and minimize leakages through Service gates

iii Repair of combined canal with EDA for I.O and filling pond between masonry section to foot power House with drainage system.

iv Replacing drainage arrangement in gallery and enlargement of drainage pipe connecting M1 to M3

v Removing leaching material and gallery gutter cleaning, providing antiskid tiles, railing in gallery.

vi Replacement of drainage conduit from sump well to river

vii Renovation of approach roads, fencing work, cross drainage structure to road

B. Hydro Mechanical Works

i Providing steel framed hoist structure with cabin system and platform for I.O. E.G. gates.

C) **Electrical work**

i) Supply erection, testing and commissioning of lightning arrester, dam street light at Kanher dam.

D) Instrumentation, SCADA, Surveillance system, etc

i supply and installation of one plumb bob with digital reading unit.

ii Providing and Fixing casagrande type 13 nos. piezometers

iii cleaning of existing 18 uplift pressure cell and installation and commissioning of digital gauge for pressure measurement with data acquisition system.

All vertical porous drains are choked and they need to be reamed for proper functioning.

Power house is located on left side of the spillway and Tail channel. Irrigation channel passes between the tail channel and power house. Initial 130 metres of length of canal adjacent to power house leaks tremendously into the stilling basin since its right side lining is common with the left side guide wall of Stilling Basin.

All the leaching material shall be scrapped out and tested for its chemical composition

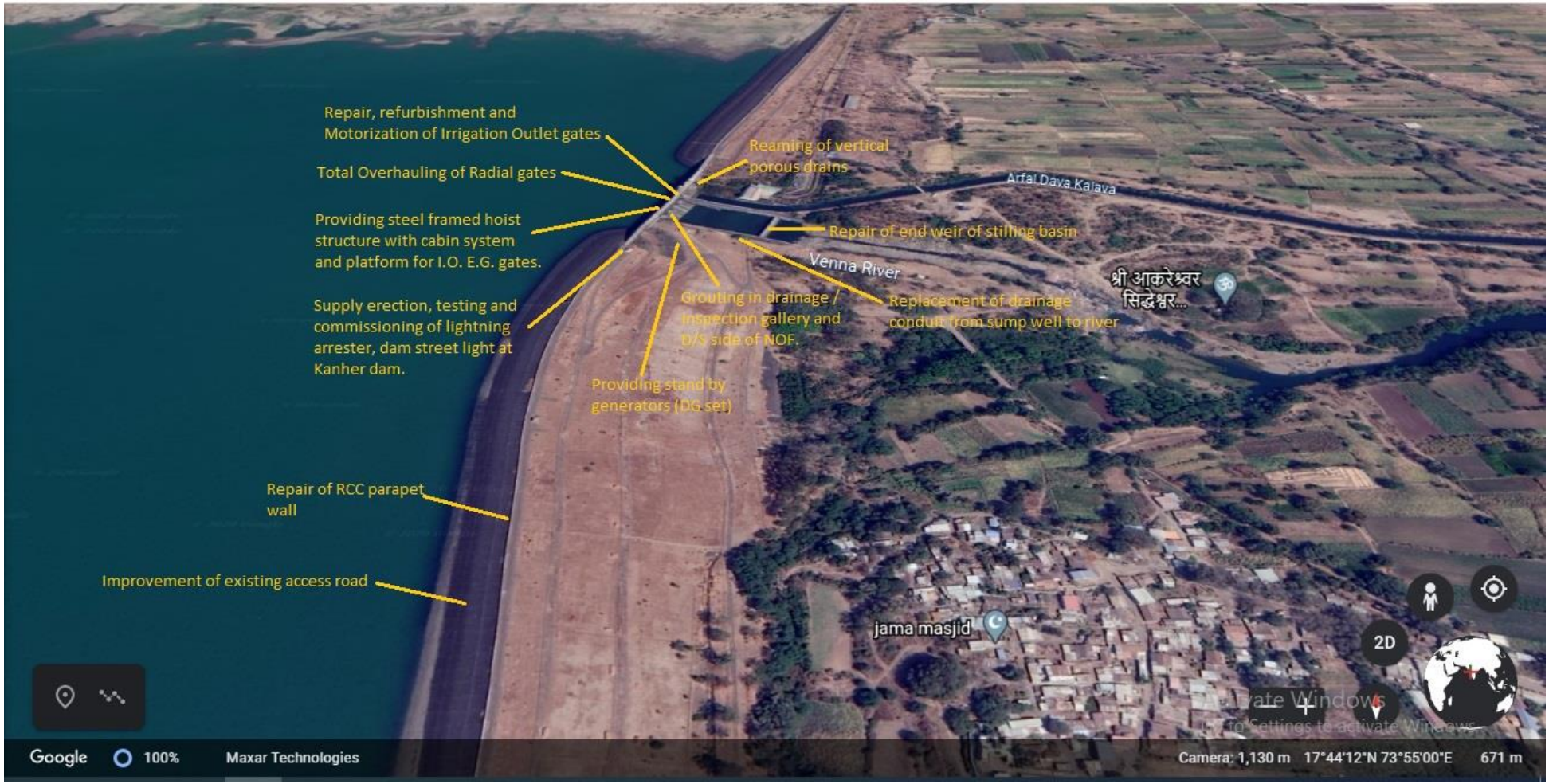


Figure 1.2: Project Area showing major intervention locations

1.3 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 labour intensive activities and would be completed over a period of 30 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:

a) Overall Phasing of Project Implementation:
Proposed Starting of implementation (MM/DD/YYYY): 01/06/2021
Proposed Ending of implementation (MM/DD/YYYY): 30/05/2023
Implementation Duration (months) (MM): 24 months

b) Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	June-2021	March -2023	Under estimate stage
2	Other works Package.	Jan-2022	June-2023	Under estimate stage
3	Instrumentation works	Jan 2022	June-2023	Under estimate stage

1.4 PURPOSE OF ESDD

The overall project (DRIP II) was categorized as **High 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.

1.5 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.

Detailed consultations with communities living downstream/vicinity of the dam, could not be 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 OF IA

2.1 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 vary 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 require 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 Kanher dam, regulatory clearances will not be applicable as per Indian regulation. Other applicable regulatory requirement is discussed in ESMF.

2.2 DESCRIPTION OF INSTITUTIONAL FRAMEWORK

The sub-project will be implemented by Water Resources Department (Pune 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 (Pune 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 have basic expertise in-house to address E&S issues and prepare ESDD reports for sub-projects. Further, Environment and Social activities within the scheme will be dealt by individual experts procured by SPMU. Presently, Project Director at SPMU and Executive Engineer at dam level look after these aspects. SPMU 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.

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, Krishna Irrigation Division, Satara is Head of Grievance Redress Mechanism within the department to address any kind of grievance / complaints by general public. As committed in ESCP, a Grievance Redress Mechanism (GRM) will be established and operated by the contracted agencies to address Project workers workplace concerns before start of work. SPMU will have oversight responsibility on the functioning of the GRM.

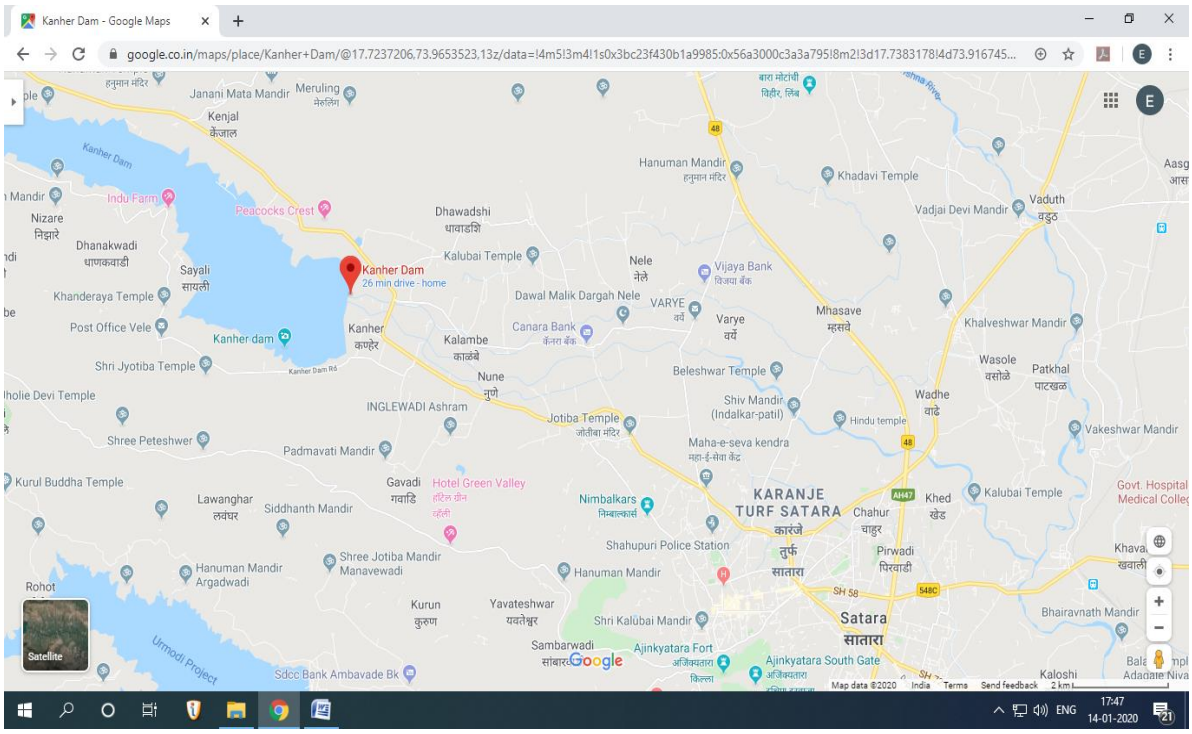
Chapter 3 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

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.

3.1 PHYSICAL ENVIRONMENT

Land Use/ Land Cover

The project surrounding area land use and environmental sensitivity was analysed 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 waterbody (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. Seven villages are falling in 5 km radius on downstream of dam namely – Akale, Malyachivadi ,Kanher, Kondave, Panmalewadi, Hamdabad, Mhasave



[(Source: Digital data on land use/land cover maps using bhuvan prepared by National Remote Sensing Centre (NRSC) with Maharashtra Remote Sensing Application Centre along with further refinement using Google Earth]

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. Spillway capacity of the project at MWL is 1778 cumec while the revised design flood has been worked as 3430 cumec which is even lower. Project falls in earthquake zone III, there is no revision and dam design has taken care of this aspect as well. Zones, viz. Zone II, III, IV and V. Zone II are the least active and Zone V is the most active respectively.

Project falls in earthquake zone III and dam design has taken care of this aspect as well as structural review has also been undertaken. Dam is in high seismic zone, however, local rehabilitation activity do not pose any risk on this count. In case, of any natural disaster, emergency response will be as per dam's 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.

3.2 PROTECTED AREA

Nearest Protected Area

As there is no any Wildlife Sanctuary or forest area in the vicinity of project. So No permission or clearance would be required to carry out any of the proposed rehabilitation work at Kanher dam.

3.3 SOCIAL ENVIRONMENT

The Kanher dam is located at village Kanher in Taluka & District Satara 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 Akale, Malyachivadi ,Kanher, Kondave, Panmalewadi, Hamdabad, Mhasave The project area does not fall within the Schedule V[1] areas of Maharashtra.

The Satara district is divided into sub-divisions of Satara, Karad, Wai & Phalatan which are further divided into eleven tehsils viz Satara, Karad, Wai, Phalatan, Koregaon, Mahabaleshwar, Khandala, Jawali, Man & Khatav . The economy of the district is primarily dependent on Agriculture sector. The brief demographic characteristic of the district is given in the table below:

No. of Households	**6,53,735**	**Household Size**	**04**
Total Population	**30,03,741**	**Population (0-6 age)**	**3,17,885**
Male	15,10,842	Boys (0-6 age)	1,67,729
Female	14,92,899	Girls (0-6 age)	1,50,156
Sex Ratio	988	Sex Ratio (0-6)	895
Population (SC)	**3,23,236 (10.7%)**	**Population (ST)**	**29,635 (0.99%)**
Male	1,61,703	Male	15,210
Female	1,61,533	Female	14,425
Literates	**22,25,694**	**Literacy Rate (in %)**	**82.87**
Male	12,01,034	Male	89.42

[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.**

Female	10,024,660	Female	76.31
No. of Workers	13,54,947	**Cultivators**	5,85,876 (43.24%)
Male	8,44,805	**Agricultural Labours**	3,58,863 (42.48%)
Female	5,10,142	**Household Industrial Workers**	39,772 (2.94%)
No. of Main Workers	**11,84,407**	**Other Workers**	4,32,058 (31.89%)
No. of Marginal Workers	**1,70,540**		
Source: Census of India, 2011 (District Handbook)			

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 kanher Dam.

3.4 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.

Chapter 4

ACTIVITY WISE ENVIRONMENT & SOCIAL SCREENING, RISK AND IMPACTS IDENTIFICATION

4.1 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.

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 labour camp and debris disposal will be beyond dam area. Transportation of material, debris disposal and labour 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 labour 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 labour, albeit few in numbers, for construction works is likely. The labour will stay outside the dam premises, hence risk of SEA/SH is likely.

Proposed non-structural interventions include Emergency Action Plan, Early Warning System and Flood Forecasting System, etc. During implementation, project will reach out to downstream population including 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 dont's 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 screened for associated sub-activity and evaluated for the extent of risk. Sub-activity's Risk/Impact intensity is further categorised 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 analysed 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, 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.

- Grouting in drainage / inspection gallery and D/S side of non-overflow section to control seepage.
- Reaming of vertical porous drains and re-drilling of foundation drains.
- Construction & Improvement of approach road to Kanher Dam.
- Providing Epoxy grouting treatment to Drainaige /Inspection Gallery and minimize leakages through Service gates
- Repair of combined canal with EDA for I.O and filling pond between masonry section to foot power House with drainaige system.
- Removing leaching material and gallery gutter cleaning, providing antiskid tiles, railing in gallery

All other activities are categorised as low risk activities. 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 template which brings 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 (as per outcome of SF-2) is summarised for major sub-project activities under **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 downstream 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	M	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
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	M	L	L	None	None	L	M	L	M	L	L	M
Labour camps	M	L	L	None	None	L	L	L	M	L	L	L
Additional activities for Tourism /Solar/Fisheries/ Water recreation enhancement	NA	NA	NA	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.

4.2 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 is not permitted even today during the Unlock phase. A formal consultations will be held and outcomes documented at opportune time.

4.3 DESCRIPTIVE SUMMARY OF RISKS AND IMPACTS BASED ON SCREENING

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

Environmental Impacts and Risks

1. Environment risks and impacts, as assessed above, for various project activities under this sub-project are categorised as Low and Moderate due to localised nature of proposed activities i.e. activities remain limited to dam area except for labour camp and muck/debris disposal.
2. Execution of civil and hydro-mechanical work within dam body will generate localised 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 labour involvement.
4. Civil work interfaced with water body such as work on upstream face of dam shall pose risk of water pollution and impact on fish fauna. Ingredients for the preparation of mortars and grouting suspensions include cement, clay and fillers, bentonite, asphalt, additives for stability and water. Some ingredients and chemicals used in the preparation of mortars and grouting suspensions may be toxic and irritants. Their use may have negative impacts on both humans and the environment.
5. Construction and demolition waste and muck require careful disposal at pre-identified and approved site to minimise the risk of pollution on this count.
6. No impact on general ecology is envisaged.
7. Rehabilitation work would require labour 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. Further there will be no physical interventions outside the dam.
3. Number of migrant labour will be low as these works require only few but very skilled labour. These workers will mostly operate from labour 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 labour 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. Labour 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 labour/workforce in situations of natural calamities.
   - Health risks of labour 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 labour to seek redress of their grievances/issues

Chapter 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 Risk Classification

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Fisheries, Physical Environment, labour and SEAH/GBV. The summarised environmental and social risks of identified activities with level of risk are presented in previous chapter. Environment risks of air, water, noise, and resource use as well as social risks of labour, civil work within the dam body and road work are Moderate. Similarly, environment and social risk of labour camp and disposal of debris has been identified as moderate. Risk of all other activities has been identified as Low. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines.

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.

5.1.2 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.

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: Labour 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
ESS 4: Community Health and Safety	Rehabilitation work, although limited to dam complex, can increase community exposure to risk and impacts; directly or indirectly.
ESS 10: Stakeholder Engagement Plan	For engagement of stakeholders in all structural and non-structural interventions e.g. Early flood Warning system, siren systems, broadcasting facilities, Emergency Action Plan etc.

5.2 RECOMMENDATIONS

5.2.1 Mitigation and Management of Risks and Impacts

Since risks and impacts are low to moderate category, a standard ESMP customised to sub-project will be prepared in accordance with the ESMF. It shall cover the following aspects:

a. SPMU shall customise the standard 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 will provide due measures for labour 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 will 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). SPMU/IA shall customise the standard ESMP in line with outline provided in the ESMF and ensure its adherence by contractor. The customised ESMP will address the following:

- Gender Based Violence or SEA/SH related actions (ESS1)
- Labour 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: Labour and Working Conditions	• Labour 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

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS 4: Community Health and Safety	• Community Health and Safety Management Plan (CHSMP)	SPMU/IA	Before mobilization of contractor
ESS 10: Stakeholder Engagement Plan	• SEP in accordance with project SEF	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.

5.2.2 Institutional Management, Monitoring and Reporting

ESMP will be customized for the sub project by SPMU/IA from standard ESMP included in ESMF 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 within 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)	**A**	**DI**	**WQ, F, OH, PE, L, G**
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.)	**A**	**DI**	**WQ, F, OH, PE, L, G**
6	Remodeling earth dams to safe, stable cross sections	**NA**		
7	Electro-mechanical activities with interface with dam reservoir	**A**	**DI**	**OH, WQ, L, G**
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	**A**	**DI**	**PE, L, G**
12	Painting Work	**NA**		
13	Water recreation activities	**NA**		
14	Tourism Development	**NA**		
15	Solar power/floating solar	**NA**		
16	List any other component not listed above			

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated within 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**
i	Addition of Geo-membrane / Concrete cladding	**A**	**DI**	**WQ, F, OH, L**
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)	**A**	**DE**	**G**
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**
17	Major Debris Disposal involved	**A**	**DE**	**PE, L, G**
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**			
	NIL			
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	Reaming of vertical porous drains and re-drilling of foundation drains.	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, , risk of river water contamination and impact on fishes, generation of construction debris, Occupational health and safety risk due to working on upstream face of dam, labour and GBV risk	**M**
b	Providing Epoxy grouting treatment to Drainaige /Inspection Gallery and minimize leakages through Service gates	**WQ, OH, PE, L, G**	Air pollution, noise pollution, risk of spillage of wastewater to river, construction debris, muck, Occupational health and safety risk. Labour &GBV risk	**L**
c	Repair of combined canal with EDA for I.O and filling pond between masonry section to foot power House with drainage system.	**WQ, F, E, OH, PE, L, G**	Air pollution, noise pollution, impact on ecology, risk of river water contamination and impact on fishes, construction debris and muck generation, Occupational health and safety risk, Labour and GBV risk	**M**
d	Replacing drainage arrangement in gallery and enlargement of drainage pipe connecting M1 to M3	**WQ, PE, L, G**	Air pollution, noise pollution, water pollution, Labour and GBV risk	**L**
E	Removing leaching material and gallery gutter cleaning, providing antiskid tiles, railing in gallery.	**WQ, OH,L,G**	noise pollution, Occupational health and safety risk, Labour and GBV risk	**L**
F	Replacement of drainage conduit from sump well to river	**WQ,,OH,L,G**	Air pollution, noise pollution, , construction debris and muck generation, Occupational health and safety risk, Labour and GBV risk	**L**
g	Construction & Improvement of approach road to Kanher Dam	**OH, PE, L, G**	Air pollution, noise pollution, construction debris,	**M**

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**
			Occupational health and safety risk	
3.	**Electro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)**			
a	Repairs/ replacement of gates & hoists	**WQ, F, OH, PE, L, G**	Water pollution, impact on fish, Noise pollution, Occupational health and safety risk due to working at heights, waste generation from removed parts, Labour & GBV risk	**M**
b	Electrical works	**OH, PE, L, G**	Occupational health and safety risk due to electrical work, waste generation from removed parts and packing material, Labour & GBV risk	**L**
c	Safety measures like siren, Warning System - Alarm system etc.	**PE, L, G**	Waste generation from removed parts and packing material, Labour & GBV risk	**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**	Occupational health and safety risk due to electrical work, waste generation from removed parts and packing material, labour 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	Labour Camp involved (location within dam premises or outside)	**WQ, PE, G**	Wastewater generation from domestic activities, waste generation, GBV risk within labour and involving community.	**M**
3	Migrant labour likely to be involved	**L, G**	Migrant labour having low degree of interface with community	**L**
4	Likely interface of Workers with communities	**L, G**	Risk of GBV due to labour 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 and maintenance of gates and hoists and for other activities - OH risk due to machine handling, waste, wastewater	**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
			and air emissions from machines operations, hazardous waste generation from oil waste, Labour & GBV risk	
6	Concrete mixture and heavy pumps to be deployed	**OH, PE, L, G**	Concrete mixture and pumps will be deployed for road repair and other 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, Labour & GBV risk	**L**
7	Haulage of machinery involved	**OH, PE, L, G**	Machines will be hauled from different location and brought to site; OHS risk during loading/unloading and air and noise pollution during transportation, labour and GBV risk	**L**
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, water pollution risk due to debris finding its way to water body, and GBV risk due to labour involvement	**M**
9	Major Transport of materials involved	**OH, PE, L, G**	Material will be transported 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, Labour and GBV risk	**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: 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.