DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)
Phase II

(Funded by World Bank)

JAYAKWADI DAM
(PIC:MH09HH0597)

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT

MARCH 2021

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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

JAYAKWADI 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, 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 1976 and over a period of time the submergence area i.e. reservoir has been declared as Bird sanctuary. Also Eco sensitive zone is declared along periphery upto 500m on all sides of reservoir. 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 labour 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 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)
- Bio-diversity Conservation plan (ESS6)
- 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: 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, 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.

1.2 SUB-PROJECT DESCRIPTION – JAYAKWADI DAM

Jayakwadi dam is a major project constructed on Godavari river in Godavari basin on the upstream of Paithan, Dist. Aurangabad (Latitude 190 45' N to 190 55' N and longitude 750 35' E to 750 45' E) in Marathwada region of Maharashtra state. Godavari River originates at Triambakeshwar in Nashik District which is further joined by main tributaries of Darna, Kadwa and Pravara River. The total catchment area at Dam is 21774 sq km and free catchment is 14750 sq km.

Construction of project started in 1965. Administrative approval had been given vide letter No PIM.3164/103171 IP (Cell) dt.13/1/1965 and had been permitted by CWC, New Delhi vide letter No.F.8/32/64 TE. Dated 25/08/1964. The dam portion was completed in 1976. Jayakwadi project constructed in two stages in which Stage 1 is Jayakwadi Dam and Paithan LBC and Stage 2 is Paithan RBC & Majalgaon Dam.

The length of Jayakwadi dam is about 10 km. It has 490 m long masonry dam in the river gorge portion and earthen dam in remaining length on both flanks. The maximum height of masonry dam and earthen dam is 37 and 28m respectively. Jayakwadi Dam is having storage capacity of 2909 Mcum. The basic data and salient features of the project are detailed below.

The project serves the purpose of irrigation, drinking i.e. non irrigation and industrial. Thirty water supply schemes get water for drinking purpose through the project & thirteen schemes get water for Industrial Purpose through the project. Total ICA of PLBC & PRBC is 183000 Ha. Also there is hydropower generation project of capacity 12 MW with reversible vertical shaft Francis type turbine.

Sr. No.	Description of Details	Name of project : Jayakwadi Project Stage 1	
1	2	3	4
1.	Scope of the scheme	An Irrigation Project with storage on Godavari River at Paithan having irrigation 1,83,322 ha.	
2.	Sources	Godavari River	
i)	Gross Capacity At F.R.L	2909.041 Mm3	
ii)	Capacity at Dead storage	738.106 Mm3	
iii)	Capacity at Live storage	2170.935 Mm3	
iv)	M.W.L	465.582 m	
v)	F.R.L	463.906 m	

vi)	Carry over	381.70 Mm3 (13.48TMC)	
vii)	Evaporation losses	664.83 Mm3 (23.47 TMC)	
viii)	Area under submergence (FRL)	39761 Ha	
ix)	Max ht of Dam from RBL	37.73 m	
x)	a)Total qty of earth work for dam	13.00 Mm3	
	b)Total quantity of masonry/concrete	0.33 Mm3	
	c) Total quantity of excavation in the spillway, approach and tail channel	24.65 Mcuft	
xi)	Total length of dam	9997.67 m	
xii)	Free board over MWL	3.358 m	
xiii)	Spillway		
	a) Ogee	With 27 Gates, 12.50 X 7.90m	
	b) Design Flood	800000 Cusec	
	c) Depth over Crest for design flood	31.5 ft (9.60 m)	
	d) Length of Spillway	417m including 26 central piers of 3.05m.thick	
xiv)	Outlets	PLBC	PRBC
	a) Location	477 m	8880 m
	b) Type	Vertical lift gate	Vertical lift gate
	c) Full supply discharge required	3600 cusec (100.80cumec)	2250 cusec (63.71cumec)
	d) Length	208 km	132 km
3.	Cost of the Scheme (Approved in 2/83)	Rs in Lakhs	
	1) Dam & Head works	5853.88	
	2) Canal & Distributaries	10798.17	
	Total	16652.05	
4.	Cost per Ha. Irrigated on cropped area:	Rs.11760/-	

5.	Cost Benefit Ratio (Combined For Stage I & II)	1.51

View of Dam

Proposed Interventions/ Activities and intended Outcomes

Dam Safety Review Panel (DSRP) constituted by state Government has inspected and made a review of Jayakwadi dam on 11th 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

A) On Earthen section

1) Earthen Cross section restoration with u/s pitching and d/s slope
2) Repairs to u/s parapet wall on earthen section
3) Renovation of approach roads with cross drainage structures
4) Renovation of surface drainage system on d/s slope of earthen section
5) Providing lining up to 100 m length of left bank canal on d/s of head regulator

B) On Masonry Section

6) Epoxy treatment on ogee shape of spillway
7) Replacement of railings on spillway
8) Construction of guide walls on d/s of spillway for protection of river bank
9) Cleaning and reboring of vertical porous holes and foundation holes
10) Construction of 5 m wide apron adjacent to stilling basin for river bed protection
11) Hydro mechanical and electrical works relating to various gates

Non-structural Measures

Basic facilities

12) Renovation of rest house and approach roads to dam site
13) Electrification in dam premises

Instrumentation, SCADA and Surveillance

14) Supply and installation of various instruments suggested by DSRP
15) Installing SCADA system for flood control
16) Providing CCTV in dam premises
17) Erecting chain link fencing on d/s of dam wall throughout dam length

Tourism development

18) Constructing display room and development of surrounding area.

Fig 1.1 provide photographs of key infrastructure proposed for rehabilitation works.

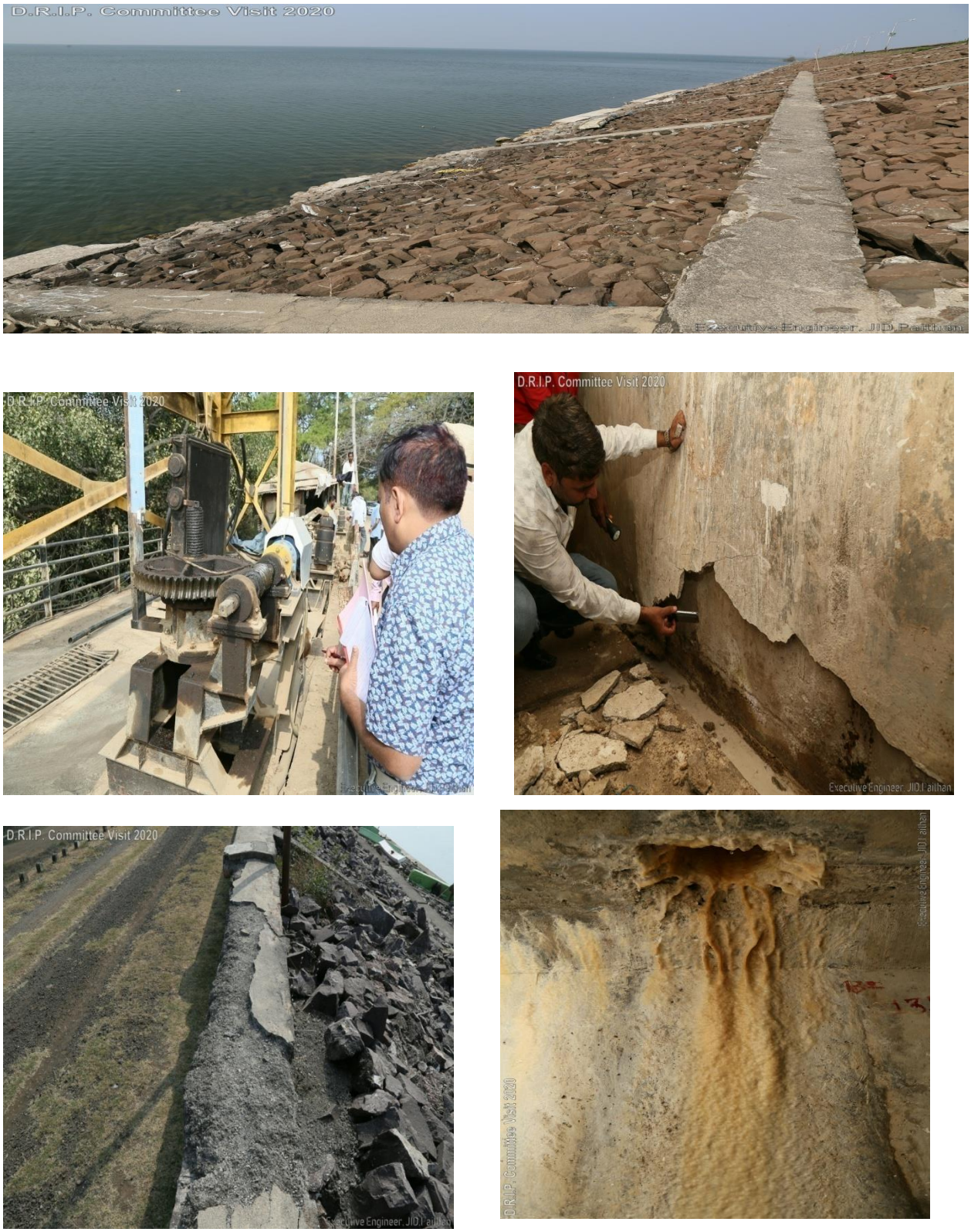


Figure 1.1: Selected Photographs of Improvement/Intervention area

Figure 1.2 show locations of major interventions marked on Google earth image.

Figure 1.2: Project Area showing structural measures/interventions

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 36 months. SPMU will hire contractor(s) based on national open competitive procurement using a Request for Bids (RFB) as specified in the WorldBank'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): 01/06/2021
Proposed Ending of implementation (MM/DD/YYYY): 31/12/2023
Implementation Duration (months) (MM): 36 months

Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	June-2021	Dec -2023	Under estimate stage
2	Other Packages	June-2021	Dec-2023	Under estimate stage
3	Procurement – instrumentation, goods, inspection vehicles	Yet to be decided		

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.

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

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 JAYAKWADI 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 (Konkan 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 (Godavari Marathwada Irrigation Development Corporation, Aurangabad), 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, JAYAKWADI DAM Management Division is Head of Grievance Redressal 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.

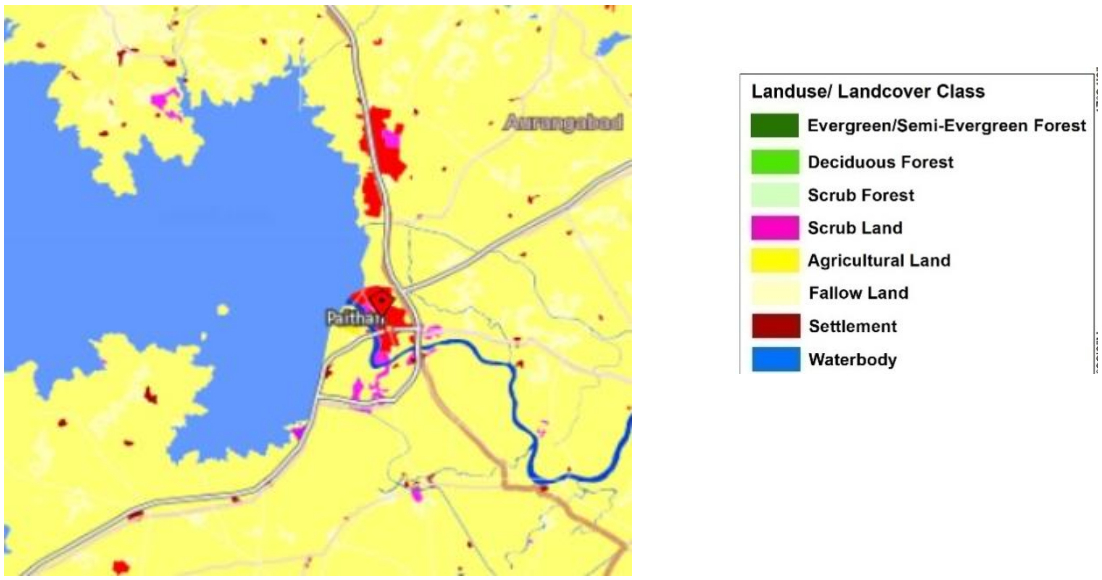
Chapter 3 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

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 around dam is predominantly agricultural land and water body (reservoir). In addition, there are small patches of scrub land with scattered habitation on both the banks of river. Proposed rehabilitation work will be confined to dam area and no structural interventions are proposed beyond existing dam boundaries. Major villages are identified in dam surrounding (within 5 km) are Paithan, Kawsan, Telwadi, Katpur, Mudhalwadi, Pimpalwadi (Pirachi) etc.



[(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 has been reviewed and earthquake review is to be undertaken. As per BIS 11223-1985 criteria, Jayakwadi dam is a large dam and qualifies for PMF (Probable Maximum Flood) as the design flood for the dam safety

review. Revised design flood calculated by CWC in May, 2020 comes to 20257 cumec. Flood routing study is still to be done. DSRP has recommended that the flood routing study should be done on priority in consultation with Central Design Organization, Nashik. Based on the outcome of the study, appropriate measures shall be taken to ensure safety.

Project falls in earthquake zone II and dam design has taken care of this aspect as well as structural review is to be undertaken. Dam is in low seismic zone and also 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

The Revenue and Forests department of Maharashtra State Government vide the notification No.WLP-1086/ 27206/CR 39/86(II) F-5, dated 10/10/1986 has notified an area of 341.05 sq.km. of submergence of Jayakwadi projects as the Jayakwadi bird sanctuary. Also vide notification No. S. O. 2202 (E) dated 12.07.2017 Eco sensitive zone of Jayakwadi bird sanctuary of 141.05 sq.km. area (upto 500 m distance on all sides of submergence) was finalized by MoEFCC.

The location of protected area, in relation to Jayakwadi dam is shown in Figure 3.2.

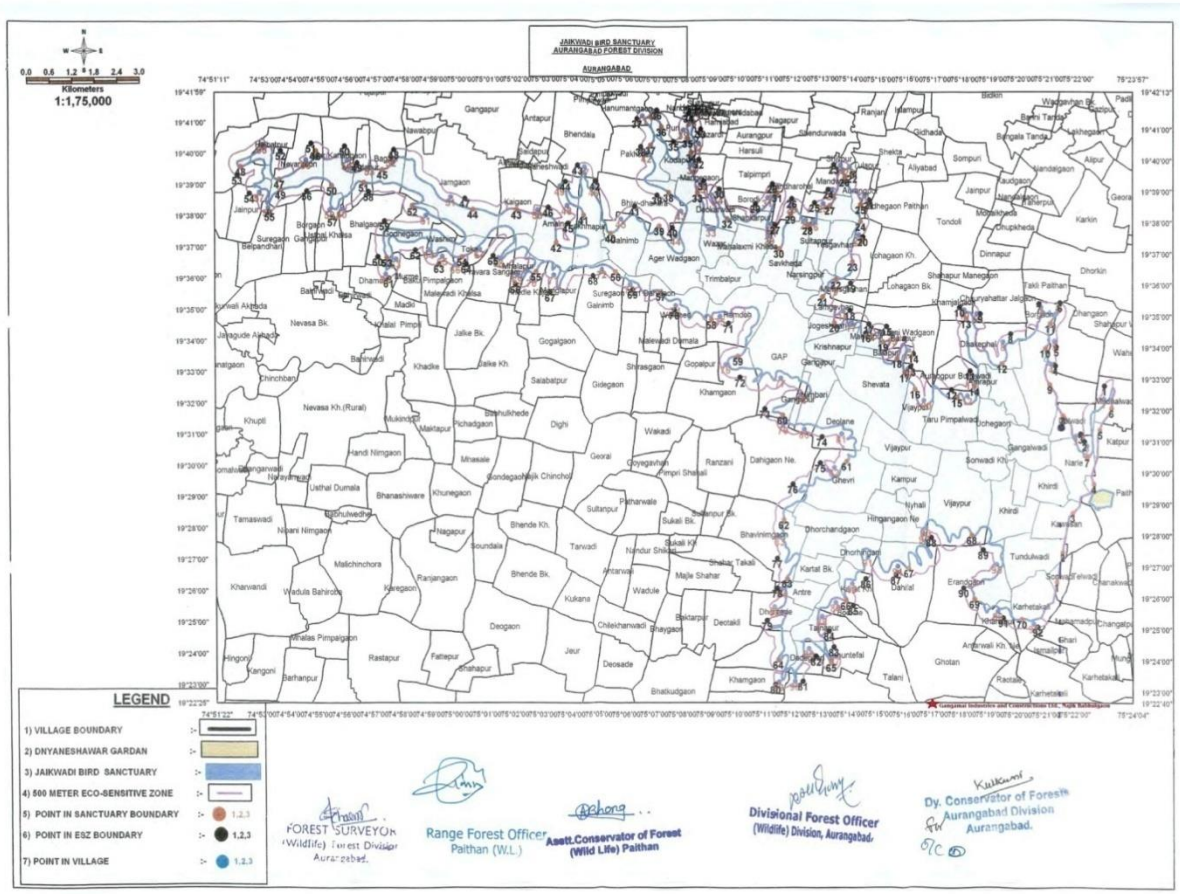


Fig 3.2: Map showing Location of Jayakwadi Dam, Bird sanctuary and Eco sensitive zone.

More than 50 fish varieties are survives in the Nathsagar reservoir. Also around 200 local and 70 migrant varieties of birds obtained in the sanctuary. During October to February Flamingo, Spoonbill, Pointed Stork, Night heron, White stork, Wagtail, Pintail, Shoveler, Sandpiper etc, bird varieties migrates in the sanctuary from Austria, Siberia, Nepal, Russia, China, Tibet and South Africa.

Also many varieties of snakes are found in the dam area along with many more mongooses.

Keeping in view the project location as mentioned above; the rehabilitation work, although limited to dam area will be planned and executed very carefully ensuring no impact on protected flora and fauna. The dam is operational since 1976 and protected areas including bird sanctuary has been notified later. Nathsagar (reservoir) is an important component of the protected area habitat. Regular maintenance and operation of the dam, is being done, including the movement of man and material without any disturbance to the protected area. Keeping in view, the ecological sensitivity of the area, a Biodiversity Conservation and Management Plan shall also be prepared as part of ESMP in compliance with WB ESS6. The plan will ensure no indirect impact on the protected area especially due to outside labour, if required to be engaged for rehabilitation work. Before, start of work, details of

rehabilitation work will be shared with Wildlife Warden and any permission required, will also be taken appropriately.

3.3 SOCIAL ENVIRONMENT

The Jayakwadi dam is located on west of Paithan taluka place in Aurangabad district. The major villages/urban areas falling within 5 km distance from dam are Paithan, Kawsan, Telwadi, Katpur, Mudhalwadi, Pimpalwadi (Pirachi) etc.

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

Aurangabad District is divided into sub-divisions of Paithan, Vaijapur, Sillod, Aurangabad and Kannad which are further divided into 9 tehsils. The economy of the district is primarily dependent on agriculture and industrial sector. The brief demographic characteristic of the district is given in the table below:

No. of Households		**Household Size**	
Total Population	3701282	**Population (0-6 age)**	532659
Male	1924469	Boys (0-6 age)	286721
Female	1776813	Girls (0-6 age)	245938
Sex Ratio	923	Sex Ratio (0-6)	858
Population (SC)	539368(14.57%)	**Population (ST)**	143366 (3.87%)
Literacy (Rural/Urban)%	69.45/81.57	**Literacy (Rural/Urban)%**	58.42/82.34
Male **(Rural/Urban)**	80.84/89.42	Male **(Rural/Urban)**	69.79/88.83
Female **(Rural/Urban)**	57.49/73.35	Female **(Rural/Urban)**	46.56/75.75
No. of Workers	1354947	**Cultivators**	554518 (35.21 %)
Male	844805	**Agricultural Labours**	396630 (25.18 %)
Female	510142	**Household Industrial Workers**	28033 (1.78%)
No. of Main Workers	488121	**Other Workers**	595898 (37.83 %)
No. of Marginal Workers	71094		
Source: Census of India, 2011 (District Handbook)			

The Jayakwadi dam is a main feature of the district and is one of the unique hydroelectric projects in Maharashtra. This scheme has a considerable impact on the industrial development in this area. It also fulfils the need of electrification. Aurangabad is one of the fastest growing city in the Asia. The literacy rate of the district is 79.02 percent.

District has small Scheduled Tribe population (3.87% of the district population); they are mainstreamed in the area and do not possess any characteristics as outlined in ESS7. Further, there are no physical interventions planned outside the dam, except for engagement of community during EAP implementation; therefore, ESS7 will not be triggered.

3.4 CULTURAL ENVIRONMENT

As per list of National Monuments in Maharashtra and list of State Protected monuments in Maharashtra; there are national monuments in and around dam site i.e. within 10 km radius of dam site. But Tirthstambh (Tirthkhamb) is a state protected monument in the Paithan city, which is 3.5 km away from Jayakwadi dam.

[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

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. Although

no intervention is planned outside the dam, due to location of the project near bird sanctuary, indirect impacts have been considered on ecology and protected area as well.

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 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 dont's during such scenarios.

Output of this screeningis 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.

- Epoxy treatment on ogee shape of spillway of Jayakwadi dam.
- Hydro mechanical works relating to various gates of Jayakwadi Project.
- Approach roads, fencing work, surface drainage structures, pitching work.
- Setting up of Labour Camp
- Disposal of construction waste/debris

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 in SF-3 for major sub-project activities is given at **Table 4.1 below.**

Table 4.1: Summary of Identified Risks/Impacts inForm SF3

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
Civil (within Dam Boundary)	M	L	L	M	L	L	L	L	M	L	L
Hydro Mechanical	M	L	L	L	L	L	L	L	M	L	L
Instrumental SCADA, surveillance& Electrical	L	L	L	L	L	L	L	L	L	L	L
Painting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road work	M	L	M	M	L	L	L	L	M	L	L
Safety measures (Siren, Lighting)	L	L	L	L	L	L	L	L	L	L	L
Major Civil Work like Additional Spill Way	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
Major Civil Work extending beyond Dam Area Like training Structure	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
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. Dam is located near bird sanctuary where proposed rehabilitation work will be undertaken. Although no activity is proposed outside the dam and no direct impact is envisaged, however, to reduce the risk of indirect impacts on “Natural Habitat” due to outside labour and increased transportation of man and material on the routes passing through the protected area; Biodiversity Conservation Plan will be prepared.
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. There are very small number of Scheduled Tribes households in the district, which 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 risks 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 redressal 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. In addition, risk of indirect impacts on natural habitat has been flagged due to location of the dam falling within near bird sanctuary. The summarised environmental and social risks of identified activities with level of risk is 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 on protected area has also 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.

In addition to overarching ESS1, five 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 6: Biodiversity	Dam is located near Bird sanctuary and Eco sensitive zone is

Relevant ESS	Reasons for Applicability of the standard
Conservation and Sustainable Management of Living Natural resources	declared around reservoir periphery. As no interventions are planned outside the dam, no direct impacts have been identified on natural habitat, however, to eliminate risks of indirect impacts due to outside labour and transportation of man and material, Biodiversity Plan will be prepared.
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 shall 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 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 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)
    - Bio-diversity Conservation Plan (ESS6)
    - 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

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
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
ESS 4: Community Health and Safety	• Community Health and Safety Management Plan (CHSMP)	SPMU/IA	Before mobilization of contractor
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	• Biodiversity Conservation Plan	SPMU/IA	Before mobilization of contractor
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.

5.2.2 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 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), Physical Environment (PE), Cultural (C), Tribal Presence (T), Impact on private land/assets/encroachers/squatters (LA), Labor (L), GBV risks (G), (Write whichever is applicable)
1	2	3	4	5
A	**Nature of Project Component and related sub activity 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 Epoxy treatment to spillway, Cleaning and reaming of vertical porous & foundation holes etc.)	**A**	**DI**	**WQ, F,PE, L, G, PA, E**
5	Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir) (like Construction guide wall at both the bank of river, Providing 5m wide apron)	**A**	**DI**	**WQ, PE, L, G**
6	Re-sectioning earth dams section & repairs to parapet wall, surface drainage system etc.	**A**	**DI**	**PE, L**
7	Hydro-mechanical activities with interface with dam reservoir	**A**	**DI**	**WQ, L, G**
8	Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir) like Canal lining	**A**	**DI**	**PE, L, G**
9	Instrumentation, CCTV, General lighting and SCADA systems	**A**	**DI**	**L, G**
10	Basic Facilities (like access road improvement, renovation of office, Chain link Fencing etc)	**A**	**DI**	**PE, L, G, E, PA**
11	Utility installation like standby generator, or setting up solar power systems	**A**	**DI**	**PE, L, G**
12	Painting of dam u/s or d/s or both faces	**NA**		
13	Water recreation activities	**NA**		
14	Tourism Development	**A**	**DI**	**E**
15	Installation of Solar power/floating solar	**NA**		
16	List any other component not listed above	**NA**		

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), Physical Environment (PE), Cultural (C), Tribal Presence (T), Impact on private land/assets/encroachers/squatters (LA), Labor (L), GBV risks (G), (Write whichever is applicable)
1	**2**	**3**	**4**	**5**
B	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Acquisition (diversion of forests land for non-forest purposes) of forest land	**NA**		
2	Acquisition of private land Resettlement and Rehabilitation (including physical or economic displacement/impact on livelihood;	**NA**		
3	Temporary loss of business or Damages to crops or trees or structures outside the ROW during Construction activities by Contractor	**NA**		
4	Borrowing earth to meet Borrow materials requirement	**NA**		
5	Sourcing of Quarry materials	**NA**		
6	Blasting	**NA**		
7	Setting up Labour Camps (location within dam premises or outside)	**A**	**DI**	**WQ, PE, L, G, E, PA**
8	Heavy machinery deployment and setting up maintenance workshop	**A**	**DI**	**PE, L, G**
9	Setting up Hot mix plant	**NA**		
10	Deployment of Concrete mixture and heavy pumps	**A**	**DI**	**PE, L, G**
11	Temporary land acquisition	**NA**		
12	Need of Tree felling/ vegetation clearance	**NA**		
13	Disposal of large amount of Debris	**A**	**DE**	**PE, L, G, PA, E**
14	Transport of large construction material	**A**	**DE**	**PE, L, G, PA, E**
15	Utility shifting	**NA**		
16	Discharge of reservoir water (lowering of reservoir water involved)	**NA**		

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), Physical Environment (PE), Cultural (C), Tribal Presence (T), Impact on private land/assets/encroachers/squatters (LA), Labor (L), GBV risks (G), (Write whichever is applicable)
1	**2**	**3**	**4**	**5**
	List any other not listed above			

Note: Occupational Health and Safety aspects / impacts/ risks are considered important part of any dam project and this risk is separately classified. It shall be managed as per defined OH&S plans in every project irrespective of size and type of project.

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	Repair works for Jayakwadi stilling basin	**PE, L, G**	Air pollution, noise pollution, generation of construction debris, labour and GBV risk	**L**
b	Anti-skid walkways in galleries and stairs.	**PE, L, G**	Air pollution, noise pollution, generation of construction debris, labour and GBV risk	**L**
c	Epoxy Mortar joint treatment to 8 monoliths of JAYAKWADI DAM.	**WQ, PE, L, G**	Air pollution, noise pollution, , risk of reservoir water contamination and impact on fishes, generation of construction debris, labour and GBV risk	**M**
d	Repairs to Deck Slab beam of spillway bridge.	**PE, L, G**	Air pollution, noise pollution, generation of construction debris, labour and GBV risk	**L**
e	Cleaning and reaming of vertical porous blocks and drainage holes.	**WQ, PE, L, G**	Water pollution, generation of construction debris, labour and GBV risk	**L**
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	Construction gabion wall at the right bank of river for protection of approach road.	**PE, L, G, E, PA**	Air pollution, noise pollution, risk on ecology, risk of river water contamination, generation of construction debris, labour and GBV risk	**L**
b	Approach roads, fencing work, cross drainage structure to road.	**PE, L, G, E, PA**	Air pollution, noise pollution, risk on ecology, construction debris, muck, Labour & GBV risk	**M**
c	Provision of cross drainage structures to the approach road to the dam beyond first check post.	**WQ, PE, L, G**	Air pollution, noise pollution, water pollution, Labour and GBV risk	**L**
3.	**Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)**			
a	• Flap gate hydraulic hoist pressure pipeline replaced with	**WQ, PE, F, L, G**	Air pollution, noise pollution, water pollution, impacts on fish, Labour and GBV risk	**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
	stainless steel material. • River sluice emergency and service gate hydraulic hoist pressure pipeline replaced with stainless steel material. • Replacement of gallery dewatering, V.T. pump (60HP) - 2Nos • Radial gate staircase (12 Nos.) replacement needed with Stainless Steel material. • By pass arrangement and air vent arrangement replacement with stainless steel material. • Manufacturing and erection of trunion girder bridge • Manufacturing and CRCA hoist erection, hoist cabin. • Replacement of chain type hoist electrical control panel. • Penstock Gate slot & trash rack slot			
4.	**Instrumentation, General lighting and SCADA systems**			
a	• Supply and installation of plumb bob in JAYAKWADI DAM. • Cleaning of existing uplift pressure cell and fixing of existing dial gauge. • Supply, installation & commissioning of new seismic instruments to JAYAKWADI DAM.	**PE, L, G**	Waste generation from removed parts and packing material, labour and GBV risk	**L**
5	**Electrical**			
a	Lightning arrestor Lightning arrestor to Seismic observatory 48 w LED light fitting 48 w LED street light fitting Off grid solar power pack Cable tray for street light Search light installation 11 KV vaccum circuit breaker	**PE, L, G**	Waste generation from removed parts and packing material, labour and GBV risk	**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**
B.	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Setting up Labour Camps (location within dam premises or outside)	**WQ, PE, G, E, PA**	Wastewater generation from domestic activities, waste generation, GBV risk within labour and involving community.	**M**
2	Heavy machinery deployment and setting up maintenance workshop	**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 and air emissions from machines operations, hazardous waste generation from oil waste, Labour & GBV risk	**L**
3	Deployment of concrete mixture and heavy pumps	**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**
4	Disposal of large amount of Debris	**PE, L, G, E, PA**	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**
5	Transport of large construction material	**PE, L, G, E, PA**	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.