DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)
Phase II

(Funded by World Bank)

BHATSA DAM

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT
(PIC:MH09HH1011)


August 2020

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ABBREVIATIONS AND ACRONYMS

AIDS	:	Acquired Immunodeficiency Syndrome
CA	:	Conservation Area
CCA	:	Culturable Command Area
CDSO	:	Central Dam Safety Organisation
CE	:	Chief Engineer's
COVID	:	Coronavirus Disease
CPMU	:	Central Project Management Unit
CWC	:	Central Water Commission
DE	:	Beyond Dam Area
DHARMA	:	Dam Health and Rehabilitation Monitoring Application
DI	:	Within 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
GOS	:	Gate Operation 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
MIS	:	Management Information System
MMP	:	Muck Management Plan
MU	:	Million Unit
MW	:	Megawatt
MWL	:	Maximum Water Level
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PAP	:	Project Affected Person
PDO	:	Project Development Objective

PE	:	Physical Environment
PMC	:	Project Management Consultancy
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
RCP	:	Resource Conservation Plan
RD	:	Rural Development
RET	:	Rare Endangered and Threatened
RFB	:	Request for Bids
RL	:	Reduced Level
ROS	:	Reservoir Operation System
SC	:	Scheduled Castes
SCADA	:	Supervisory Control and Data Acquisition
SDSO	:	State Dam Safety Organisation
SEA	:	Sexual Exploitation and Abuse
SEAH	:	Sexual Exploitation Abuse and Harassment
SEP	:	Stakeholder Engagement Plan
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

Bhatsa multi-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 along with environment and social risk of labour camp and disposal of debris. 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.

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

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

Component 3: Incidental Revenue Generation for sustainable operation and maintenance of dams(US$26.84million);

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

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

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 – BHATSA DAM

Bhatsa multi-purpose Project, a masonry dam at confluence of Bhatsa and Chorana river in the Ulhas Basin, was constructed the year 2005 with main purpose of water supply to Mumbai and Thane. The Bhatsa Dam is the tallest masonry dam in Maharashtra with a height of 85.1 m above lowest river bed level. Length of dam is is 959 m with gross storage capacity of 976.10 MCM and live storage capacity 942.1 MCM. This project is located at village Sajivali in Shahpur Taluka of Thane district.

The project supplies industrial/domestic water to the tune of 426.80 MCM besides 15 MW hydro-power installed capacity and Irrigation supplies to 48,901 ha Gross Command Area (29,378 ha CCA).

Salient features of the project area are reported below:

Project	**Bhatsa Multi-purpose Project**
River	At confluence of Bhatsa and Chorana river in the Ulhas Basin
Lat/Long	19^0 31' 00''/ 73^0 25' 15''
GCA	48,901 ha
CCA	29,378 ha
Annual industrial/domestic water supply	426.80 MCM
Hydro Power Generation	15 MW installed capacity with 70 MU average annual energy generation
Catchment Area	388.50 sq km
Main Dam	
Type	Masonry Dam
Length	959 m
Top elevation	145.07 m
Height of dam above lowest river bed level	85.1 m
Lowest river bed level	59.97 m
Spillway	
Type of spillway gates	Ogee
Length	60 m
Location of spillway	Central (Chainage 374 m to 434 m)
Crest level	134.07 m
Number of bays	5
Discharge capacity at MWL	10242.075 cumec
Size of spillway gate	12 m wide and 8 m high
Reservoir	
Maximum water level	145.07 m
Full Reservoir Level	142.07 m
MDDL	79.20 m
Live storage	942.10 MCM
Gross storage	976.10 MCM
Reservoir spread area	27.2457 sq km
Year of start of construction	1969
Date of completion	2005
Year of first impoundment	2005

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 Bhatsa dam on 10th January, 2020 and recommended measures to

improve the safety and performance of dam and associated appurtenances in a sustainable manner, and also to strengthen the dam safety institutional set-up.

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

Structural Rehabilitation Works

1. Treatment on u/s face for reducing leakages up to RL 100 m
2. Drilling and Grouting work of Bhatsa Masonry Dam From M. No. 1D to 11 & 12A to 25B
3. Upstream cement grouting of Dam body for reducing leakages
4. Downstream cement grouting of Dam body for reducing leakages
5. Strengthening of the dam buttress.
6. Addition of Geo-membrane / Concrete cladding
7. Repairs/ replacement of gates & hoists.

Non-structural Measures

8. Revision of Reservoir Operation Parameters GOS & ROS (needs to be updated after every five year)
9. Preparation of Emergency Action Plan (EAP)
10. Setting up of Warning System - Alarm system.
11. Real-time Inflow Forecasting System - Existing Automation system required to be upgraded for forecasting of inflow.

Instrumentation, SCADA, Surveillance system, etc

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

Basic Facilities Enhancement

13. Construction & Improvement of approach road to Bhatsa Dam.
14. Improvement of bridges & culverts at Bhatsa Dam.
15. Constructing instrumentation room at M.No.25 at Bhatsa Dam.
16. Improvement in the existing inspection building.
17. Electrical works

Tourism/Fisheries/Hydropower Development

18. Mini hydropower plant in free flowing water of river on downstream side of Bhatsa Dam
19. Tourism development activity.

- *The above mini hydropower plant and tourism component are not considered as part of present ESDD as feasibility studies including various options and their possible impacts*

on

environment and social are yet to be carried out. ESDD on these sub-components will be conducted separately once the planning/design and feasibility studies have been completed.

- *A review of proposed activities by World Bank experts, has suggested that instead of placing total reliance on the efficacy of the conventional methods / measures including drilling & cement grouting as well as chemical grouting / chemical treatment for stopping / minimizing the existing abnormally high leakages (53951 litres/minute i.e. 32 cusec), the Modern State-of-Art Geo–Membrane Technique should be explored. "Geo-Membrane Methodology" has been successfully implemented in the Kadamparai and Servalar Dams in Tamil Nadu under DRIP- I, the Bhatsa Dam is better qualified for introduction of this modern methodology for controlling & minimizing the existing massive leakages. Present ESDD is based on the activities proposed in PST, if there is any change of activities in future, ESDD will be updated accordingly.*

Figures 1.1 and 1.2 provide photographs of key infrastructure proposed for rehabilitation works and also major interventions locations.

Inspection gallery Monolith no 21, VPD running full with high discharge

Inspection gallery Mon full with high dischar water accumulation in g	Inspection gallery Monolith no 6, Leaching Concentration on gallery walls, water accumulation in gallery

Figure 1.1: Selected Photographs of Improvement/Intervention area

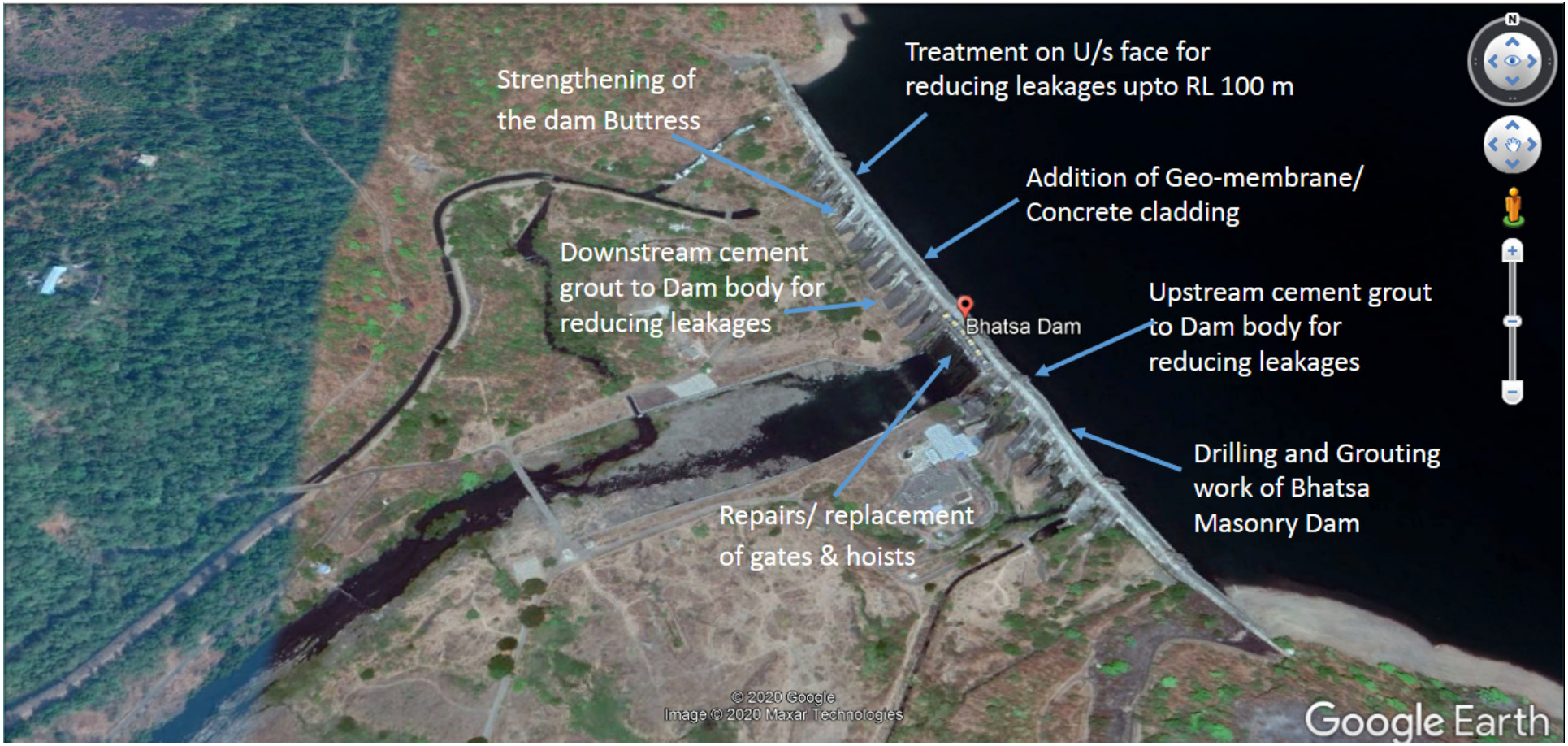


Figure 1.2: Project Area showing major intervention locations

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): 01/11/2020
Proposed Ending of implementation (MM/DD/YYYY): 31/05/2023
Implementation Duration (months) (MM): 30 months

b) Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	Nov-2020	May -2023	Under estimate stage
2	Other Packages	Nov-2020	May-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.

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

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 Bhatsa 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 (Konkan 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.

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, Bhatsa 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. SPMU will have oversight responsibility on the functioning of the GRM.

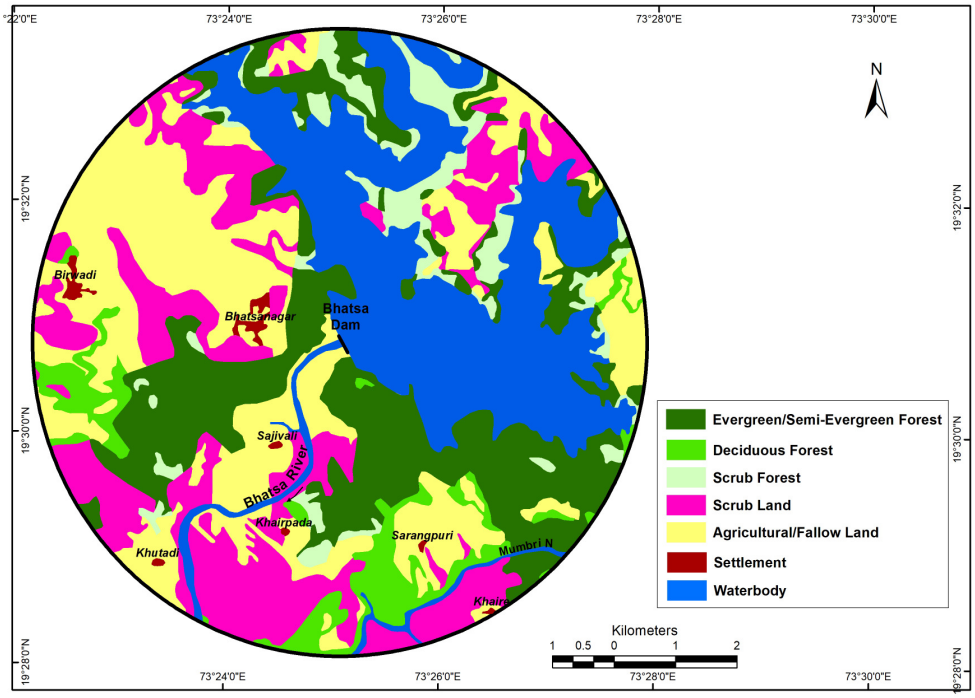
Chapter 3 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

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 - Sajivali, Bhatsanagar, Birwadi, Khaire, Sarangpuri, Khutadi and Khairpada.



[(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 10242.075 cumec while the revised design flood has been worked as 8968.60 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 is the least active and Zone V is the most active.

3.2 PROTECTED AREA

Nearest Protected Area

Tansa Wildlife Sanctuary is about 7.75 km from the Bhatsa dam location of the Project. Draft notification declaring Eco sensitive Zone of Tansa Wildlife Sanctuary is available on MoEF&CC website and project area falls well outside the ESZ. The location of Tansa Wildlife Sanctuary and ESZ, in relation to Bhatsa dam Project is shown below.

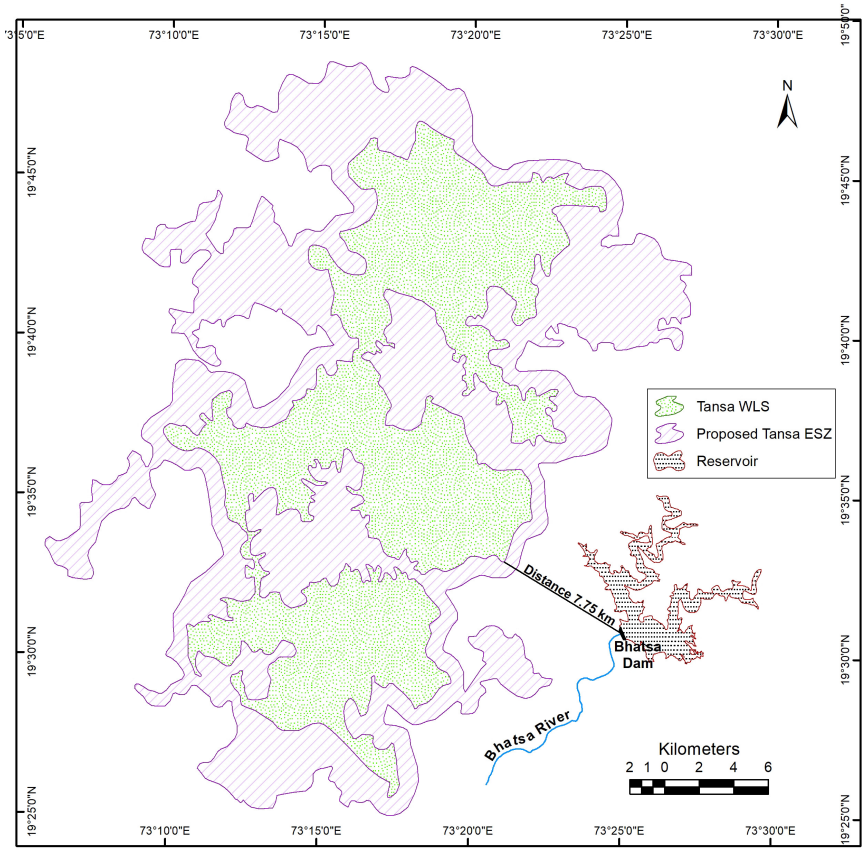


Figure 3.2: Map showing distance of Tansa Wildlife Sanctuary from Bhatsa Dam

Tansa Wildlife Sanctuary is located at Shahapur, Wada and Mokhada taluka of Thane district and extends over an area of 304.81 Km2. The leopard (panther pardus) is the species of vital importance in Tansa Wildlife sanctuary, besides other endangered species like Rusty-Spotted Cat, Jungle Cat, Small Indian Civet, Common Palm Civet, Mouse deer, Indian Rock Python, Rat Snake, Indian Cobra, Russel's Viper, Checkered keelback, Common monitor, etc., are also found in this Sanctuary. The area has a very high floral diversity and supports large number of habitat. Avi-faunal species include Little Grebe, Cormorant,

Indian Shag, Little Cormorant, Darter, Pond Heron, Cattle Egret, Large Egret, Little Egret, Night Heron, Chestout Bittern, Painted Stork, Openbill Stork, Whitencked Stork, Blacknecked Stork, Black lbis, Glossy lbis, Spoonbill, Lesser Flamingo, Lesser Whistling Teal, Pintail, Common Teal, Spotbill Duck, Mallared, Gadwal, Wigeon, Garganey, Shoveller, Common Pochard, White-Eyed Pochard, Cotton Teal, Comb Duck, Blackwinged Kite, Black Kite, Blackeared Kite, Brahminy Kite, Shikra, Sparrowhawk, White-eye buzzard Eagle, Bonelli's Eagle, Eastern Steppe Eagle, Tawny Eagle, Palla's Fishing Eagle, Indian Longbilled Vulture, Indian Whitebacked Vulture, Marsh Harrier, Montagu's Harrier, Pale Harrier, Crested Serpent Eagle, Peregrine Falcon, etc.

There is no restriction on carrying out rehabilitation work at Bhatsa dam due to proximity to sanctuary. No permission or clearance would be required from Wildlife angle to carry out any of the proposed rehabilitation work at Bhatsa dam.

3.3 SOCIAL ENVIRONMENT

The Bhatsa dam is located at village Sajivali in Shahpur Taluka (Tehsil) of district Thane in the state of Maharashtra. The economy of the district is primarily dependent on non agriculture sector. 82.9 percent are engaged in household industry workers and other workers. The literacy rate of Thane district is 84.5 percent. The percentage of Scheduled Castes population in the district is 6.6 and Scheduled Tribes is 13.9. Tanasa village in Shahapur C.D. Block has the largest area (9588.0 hectares) and Bandhanwadi village in Ambarnath C.D. Block has the smallest area (10.0 hectares) among 1721 villages of the district. The district is famous for its Chickoo and lychee plantations, mainly from Dahanu Tahsil. Bhiwandi is famous for its handloom products.

The Thane district is divided into sub-divisions of Thane, Bhiwandi, Ulhadnagar, Dahanu and Jawhar which are further divided into 15 tehsils. The proximity villages/urban areas i.e. villages/urban areas which fall within 5 km distance from dam on downstream side, are Sajivali, Bhatsanagar, Birwadi, Khaire, Sarangpuri, Khutadi and Khairpada.

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

No. of Households	**2,516,599**	**Household Size**	**04**
Total Population	**11,060,148**	**Population (0-6 age)**	**13,27,146**
Male	5,865,078	Boys (0-6 age)	6,89,665
Female	5,195,070	Girls (0-6 age)	6,37,481
Sex Ratio	886	Sex Ratio (0-6)	924
Population (SC)	**730,089 (6.6%)**	**Population (ST)**	**1,542,451 (13.9%)**
Male	377,885	Male	769,192
Female	352,204	Female	773,259
Literates	**8,227,161**	**Literacy Rate (in %)**	**84.53**
Male	4,591,396	Male	88.72
Female	3,635,765	Female	79.77
No. of Workers	**4,492,767**	**Cultivators**	349,931 (7.79%)
Male	3,363,123	**Agricultural Labours**	418,004 (9.30%)
Female	3,363,123	**Household Industrial Workers**	124,461 (2.77%)
No. of Main Workers	**3,930,511**	**Other Workers**	3,600,371 (80.14%)
No. of Marginal Workers	**562,256**		
Source: Census of India, 2011 (District Handbook)			

The project area does not fall within the Schedule V[1] areas of Maharashtra. 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 implementation of Emergency Action Plan for Bhatsa 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.

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, 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

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

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

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- Treatment on u/s face for reducing leakages up to RL 100 m
- Construction & Improvement of approach road to Bhatsa Dam
- Setting up of Labour Camp

- Disposal of Large amount of 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 in Form 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	L	L	M	L	L	M	L	L
Hydro Mechanical	L	L	L	L	L	L	L	L	L	L	L
Instrumental SCADA, surveillance	L	L	L	L	L	L	L	L	L	L	L
Painting	L	L	L	L	L						
Road work	M	L	L	L	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. Thereafter, restriction on large public gathering is still continuing. However, to ensure the participation of stakeholders in ESDD preparation and record their views, stakeholders were contacted ensuring social distancing and their views recorded. A formal consultations will be held and outcomes documented at opportune time. Two sets of questionnaires are prepared, one for each category of stakeholders – direct workers and community stakeholders. Direct workers included Engineers/staff working at dam (present or working from home) – full time or contracted and community stakeholders included local people from vicinity villages.

Stakeholder consultation was conducted as part of environmental and social due diligence, with a purpose to:

a. provide initial information to the workers and communities on the proposed project interventions and particularly the non-structural interventions, if any;
b. Help identify potential stakeholders who are involved at this stage and will be involved a later stage.
c. assess their responses in understanding the potential risks and prepare mitigation plan to address their concerns

Following is the outcome of the stakeholder consultation exercise. List of community stakeholders who participated in consultation is enclosed as **Annexure III**.

A. **Interaction with Dam Engineers/Staff**

Questions	Response provided / Observations
1. Please confirm whether all proposed structural rehabilitation activities for this dam are limited to dam compound only or any activities are proposed beyond dam complex like catchment area treatment plan, stabilization of reservoir rim area, slope stabilization de-silting etc.? Please specify if any possibility of local community interference exist during the implementation of rehabilitation measures; including stakeholder's consultation meeting planned for dissemination of emergency action plans which is a non-structural measure.	*All proposed structural rehabilitation activities are limited to dam compound only.* *There will be no possibility of local community interference during the implementation of rehabilitation measures. However, there will be involvement of local community during stakeholders consultation meeting planned for dissemination of emergency action plans.*
2. is there any unsettled issues (legacy) related to displacement or resettlement, pending since time of dam construction? If yes, please give brief detail.	*All necessary compensatory measures were taken up regarding displacement or resettlement. Also, additional demands regarding resettlement are under consideration.*
3. Any unauthorized encroachers or squatters living within dam premise? If yes, are these not a threat for the dame security and dam premise, any official action taken in the past, does the state government have legalized these squatters and these have full right in the property or dam authorities.	*No issue.*
4. What is the proposed institutional arrangement to deal the Environment and Social activities within the scheme i.e. in house team of	*Environment and Social activities within the scheme will be dealt by individual experts procured by SPMU.*

expert / hired agency or individual experts?	
5. Who will be in charge of E&S related activities at dam site and at SPMU level?	*Individual experts will be in charge of E & S related activities at Dam site & SPMU level.*
6. How do communities contact dam officials? Is there any existing mechanism known to communities to contact dam officials (through telephone/ mobile/e-mail/official website?)	*Communities can contact dam officials through telephone, mobile and e-mail as well as by written letter in person or through Postal department.*
7. What is existing mechanism to communicate with downstream communities/public on unregulated releases of water during high flood time siren/written communication to district authority / telephone / mobile / text messages or any other mode of communication?	*Communication with downstream communities /public on unregulated releases of water during high flood time is by siren (which can be heard upto 2 km on downstream) and written/ telephone / mobile communication to district authorities as planned in Standard Operating Procedure (SOP) for emergency situation.*
8. How do you ensure that downstream Community is fully aware of the above existing mechanism?	*Every year Standard Operating procedure (SOP) is updated & shared with local authorities, District Disaster Management Cell and also visits to Downstream villages to ensure that Community is fully aware of the above existing mechanism.*
9. Are there women employees at the dam site?	*No.*
10. Is there any existing Grievance Redressal Mechanism (GRM) within the department to address any kind of grievance / complaints by general public?	*Yes. Executive Engineer, Bhatsa Dam Management Division is Head of Grievance Redressal Mechanism within the department to address any kind of grievance / complaints by general public.*
11. Details of any grievance received lately related to this new Scheme?	*No grievance received.*
12. Is dam premises a restricted area or has open access to general public?	*Restricted area for general public.*
13. Are there tribal's Living in the Surrounding area of dam Complex? Which tribes are these? please give brief detail.	*Yes. Tribal's are Living in the Surrounding area of dam. Tribes namely Katkari, Thakar, and Kokana communities living Surrounding to the Dam in small villages like Shende Pada, Savarshet , Naucha Pada, Chaukicha Pada, Dhobi Pada, Yeta, RumalPada, Thadyacha Pada, PimplPada, KoliPada And Pardhan Pada. These tribes use Rice as main Food.* *These tribes are mainstreamed in the area.*
14. Does the dam have any tourism/ water recreation facilities? if yes, how many approximate tourist visits annually, annual revenue generated, whether any portion of this generated, revenue is diverted to regular O&M of this dam.	*Dam don't have tourism/ water recreation facilities. Hence no generation of revenue. However, being in the vicinity of metropolitan cities like Mumbai, Thane a huge no. of (Approx. 10000- 15000) tourist visits annually to the surrounding of the dam.*
15. Do you engage any local labourers for routine dam maintenance work? If yes, what is the process of engaging these locals for work at dam, whether through Government approved contractor or hired individually?	*Local labors are engaged for routine dam maintenance through Government approved contractor.*

B. Interaction with Local Community

Questions	**Responses Provided / Observations**
1. How many villages are in immediate downstream vicinity?	*Savarshet And Sajivali are the two villages in the Immediate downstream vicinity of Bhatsa Dam.*

2. Are they dependent on dam in any way for their livelihood?	*Drinking Water supply & Irrigation water Supply is from the downstream side of the dam.*
3. Does any of these village where displaced and rehabilitated during the construction of Bhatsa Dam. Is there any pending compensation issues?	*No.*
4. Is there any R&R[2] affected person known to You who is currently working with dam authorities? If so, in what capacity (employee/ direct worker/ contractor)	*At present 61 R & R affected persons are currently working with WRD, 35 with other Govt departments & 28 are recommended to Brihanmumbai Municipal Corporation.*
5. are you aware of any fishing communities living immediately downstream of dam whose livelihood are directly linked with the fishing activities of this dam?	*No.*
6. Are you aware of fishing working Seasons, Revenue earning, any access to general public for fishing, any suggestion etc.	*As per GoM policy agencies are appointed for fishing activities in the reservoir by Fishery Department.*
7. Are you aware of local women affected in any way by dam operation?	*No.*
8. Are you aware of any early flood warning system for this dam, or any other system wherein downstream communities getting regular update during flood season for any uncontrolled release of water?	*Dam having 24X7 working flood monitoring cell at dam site. Being Gated dam, floods are routed & flood releases are as per Reservoir Operation Schedule. As per Set procedure in the Standard Operating Procedure (SOP) all releases are communicated to District Disaster Management Cell & Concerned Tehsil & Police station.*
9. Are you aware of any dam related incident happened in the past wherein some loss of life encountered? If yes, brief summary may be given	*No.*
10. If you have to contact the dam authorities; How will you contact, through telephone/mobile/e-mail/personally?	*Through telephone/mobile/Email or by personally.*
11. In the past, on any occasion, did you contact Dam authorities for any specific reasons Affecting public in general? If so, how did you contact and how was the response of dam authority?	*Not required.*
12. Give your view about Bhatsa dam, how this Dam is helping country, State, District or local Communities in meeting its objectives, any Specific concern can also be given?	*Due to Bhatsa dam, it is possible to cultivate crops in the Rabi as well as hot weather season for local community. Bhatsa Dam also supplies water to Brihanmumbai Municipal Corporation, Thane Municipal Corporation and more than 34 Gram panchayat for drinking purpose and also supplies water to nearby industries. Generating revenue around Rs. 60 Crores. A dam Foot Powerhouse of 15 MW capacity is also working.*
13. (a) Are you aware of any document named Emergency Action Plan (EAP) of the dam? (b) If yes, do dam authorities conduct any annual mock drill or consultation meeting on dam site and invite all stakeholders to inform. (c) in future during stakeholder's consultation meeting, would you like to be a part of these consultation and mock drill	*Yes.* *Every year Pre & Post Monsoon inspections are carried out by Competent authorities with Sample verifications by Dam safety Organisation.* *Yes*

[2] R&R reference is with respect to the dam construction, which began in 1969 and continued till 2005

activities to be conducted by dam authorities? (d) If yes, how to contact you, please give thecorresponding address along with all details to receive the ethical communication.	*1) Non- Irrigation water user- BMC, TMC, MSEDCL & Industries Representative* *2) Irrigation Water User- WUA* *3) Project Affected:-* *Mr. Harishchandra Bhoir- 9403544054* *Mr. Ravi Ghavat- 7038117888* *Mr. Somnath Lakhambre- 9921064636*
14. Are you a regular follower of official website of dam authorities as a general public, in case you are a contractor, do you follow various tenders notices being invited for various maintenance of this dam?	*Yes* *www.wrd.maharashtra.gov.in*
15. Any Suggestion to improve overall System by dam authorities in any way, please give in brief?	*EAP needs to be updated, Special security measures are required during monsoon.*

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. 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.
4. Construction and demolition waste and muck require careful disposal at pre-identified and approved site to minimise the risk of pollution on this count.
5. No impact on general ecology is envisaged.
6. 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 Scheduled Tribes households in the vicinity, 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. 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 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, 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
ESS 4: Community Health and Safety	• Community Health and Safety Management Plan	SPMU/IA	Before mobilization of contractor

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
	(CHSMP)		
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.

SPMU/IA will 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 resetting of Rip-Rap, repair of training walls, treatment of Honeycombed etc.)	**A**	**DI**	**WQ, F, PE, L, G**
5	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**	**DI**	**WQ, PE, L, G**
6	Re-sectioning earth dams to safe, stable cross sections	**NA**		
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)	**A**	**DI**	**L, G**
9	Instrumentation, General lighting and SCADA systems	**A**	**DI**	**L, G**
10	Basic Facilities (like access road improvement, renovation of office, etc)	**A**	**DI**	**PE, L, G**
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	**NA**		
15	Installation of Solar power/floating solar	**NA**		
16	List any other component not listed above			
i	Addition of Geo-membrane /	**A**	**DI**	**WQ, L, G**

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**
	Concrete cladding			
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			
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**
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**
14	Transport of large construction material	**A**	**DE**	**PE, L, G**
15	Utility shifting	**NA**		
16	Discharge of reservoir water (lowering of reservoir water involved)	**NA**		
	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 (as per SF-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 (Pl give brief text summary)	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	Treatment on u/s face for reducing leakages	**WQ, F, 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**
b	Drilling and Grouting work of Bhatsa Masonry 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	**L**
c	Upstream cement grouting of Dam body for reducing leakages	**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	**L**
d	Addition of Geo-membrane / Concrete cladding	**WQ, L, G**	Water pollution, Labour risk	**L**
e	Constructing instrumentation room and Improvement in the existing inspection building	**PE, L, G**	Air pollution, noise pollution, 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	Downstream cement grouting of Dam body for reducing leakages	**WQ, PE, L, G**	Air pollution, noise pollution, , risk of river water contamination and impact on fishes, generation of construction debris, labour and GBV risk	**L**
b	Strengthening of the dam buttress	**WQ, PE, L, G**	Air pollution, noise pollution, risk of spillage of wastewater to river, construction debris, muck, Labour &GBV risk	**L**
c	Improvement of bridges & culverts at Bhatsa Dam.	**WQ, PE, L, G**	Air pollution, noise pollution, water pollution, Labour and GBV risk	**L**
d	Construction & Improvement of	**PE, L, G**	Air pollution, noise pollution,	**M**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (as per SF-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 (Pl give brief text summary)	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
	approach road to Bhatsa Dam		construction debris	
3.	**Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)**			
a	Repairs/ replacement of gates & hoists	**PE, L, G**	Water pollution, impact on fish, Noise pollution, waste generation from removed parts, Labour & GBV risk	**L**
b	Electrical works	**PE, L, G**	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.).	**PE, L, G**	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	Setting up Labour Camps (location within dam premises or outside)	**WQ, PE, G**	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 - 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 - 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**	Debris will be generated from various repair activities - air and noise emissions from debris handling and transportation,	**M**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (as per SF-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 (Pl give brief text summary)	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	**2**	**3**	**4**	**5**
			water pollution risk due to debris finding its way to water body, and GBV risk due to labour involvement	
5	Transport of large construction material	**PE, L, G**	Material will be transported from various vendors and suppliers to site for civil, hydro-mechanical work and instrumentation -,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.

Annexure III: Stakeholder's consultation: List of Participants

Sr. No.	Name	Relation with Dam – Staff, Contractor, Worker, Full/ part Time, Local NGO…	Mobile Number	Address (At Least Village Name)
1.	Mr. Ganesh Keru Gharat	Watchmen	7773949368	Kasgoan
2.	Mr. Harishchandra Bhoir	Local Farmer	9403544054	Savershet
3.	Mr. Ravi Ghavat	Contractor	7038117888	Atgoan
4.	Mr. Somnath Lakhambre	Automation Employee	9921064636	Kothare
5.	Representatives from- Non- Irrigation water user- BMC, TMC, MSEDCL & Industries Representative			
6.	Irrigation Water User- WUA			