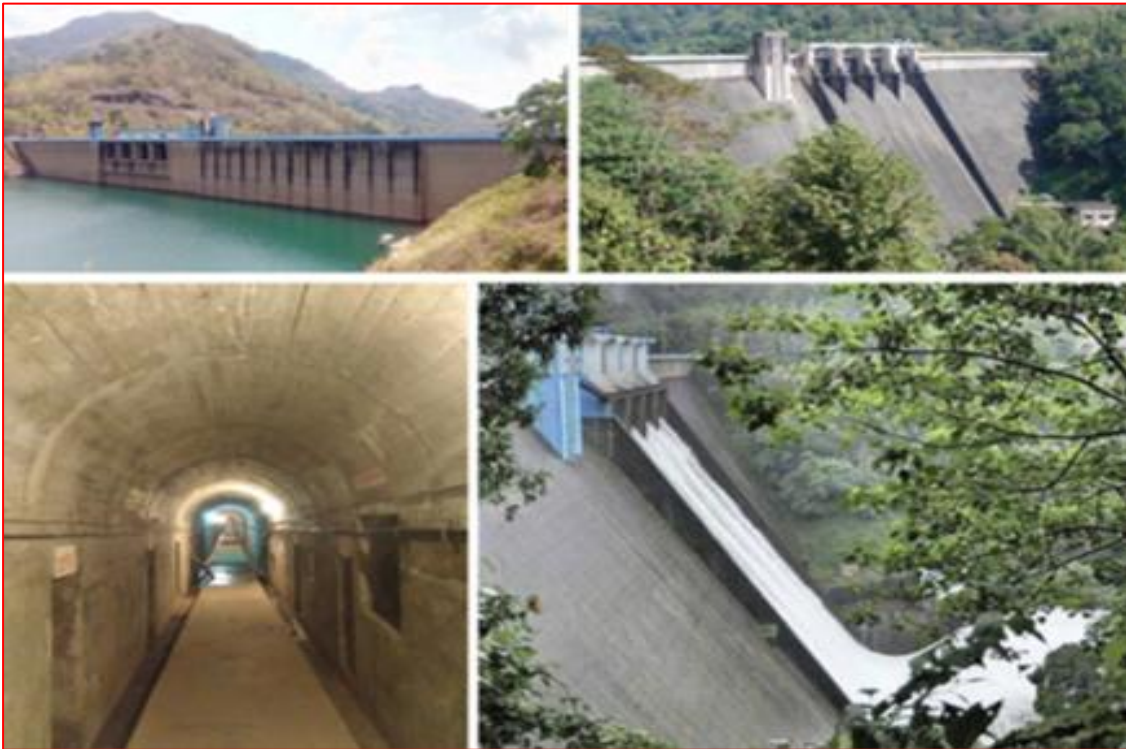


**DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)
Phase II
(Funded by World Bank)**

**IDAMALAYAR DAM
(PIC: KL29VH0036)**

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT



OCTOBER 2020

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ABBREVIATIONS AND ACRONYMS

AIDS	:	Acquired Immunodeficiency Syndrome
ASI	:	Archaeological Survey of India
BCM	:	Billion cubic meter
BOQ	:	Bill of Quantities
CA	:	Conservation Area
CCA	:	Culturable Command Area
CPMU	:	Central Project Management Unit
CWC	:	Central Water Commission
DRIP	:	Dam Rehabilitation and Improvement Project
DSO	:	Dam Safety Organization
DSRP	:	Dam Safety Review Panel
E&S	:	Environment & Social
EAP	:	Emergency Action Plan
EMC	:	Engineering and Management Consultant
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 zone
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
KSEBL	:	Kerala State Electricity Board Limited
LMP	:	Labour Management Procedure
MCM	:	Million Cubic Meter
MDDL	:	Minimum Draw Down Level
MW	:	Megawatt
MWL	:	Maximum Water Level
NRSC	:	National Remote Sensing Centre
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PAP	:	Project Affected Person
PDO	:	Project Development Objective
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
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
SEF	:	Stakeholder Engagement Framework
SF	:	Screening Format
SH	:	Sexual Harassment
SPMU	:	State Project Management Unit
ST	:	Scheduled Tribes
WB	:	World Bank
WQ	:	Water Quality

EXECUTIVE SUMMARY

Idamalayar Multipurpose Project is located at Ennakal near Bhoothathankettu on the Idamalayar River, a tributary of the Periyar River in Kerala. The project consists of hydropower plant with installed capacity of 75 MW with annual generation of about 380 GW-h. The dam is a gravity concrete structure with a total height of 102.40 m above the deepest foundation level with a gross storage capacity of 1.0898 BCM. Irrigation benefits from the Idamalayar Reservoir is by utilizing the tail-race water released from the Idamalayar Power house. The tail race discharge from the Idamalayar powerhouse is picked up at the barrage constructed across the Periyar River at Bhoothathankettu and diverted through a canal system on the right bank of the barrage. The irrigation benefits envisaged covers an area of 14,394 ha of wet and dry agricultural lands, out of which the culturable command area is 13,209 ha. The project has proposed to undertake rehabilitation measures (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. Stakeholder consultation was conducted on 18th May 2020 ensuring social distancing in view COVID19 restrictions. It was attended by permanent staff of KSEBL working at dam, local people living in the nearby area, workers of contractor executing certain rehabilitation works at dam site, contractor's representative etc.

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, Physical Environment, labour and SEAH/GBV. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. Environment risks of air, water, noise, land use, soil and resource use for activities are Low whereas social risks of labour to labour/community are Moderate. Environment risks are categorized as Low for all rehabilitation works. Environmental risk relating to Labour camp has been flagged as Moderate on environment and land. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. 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.

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\$ 26.84 million);

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

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

The project is likely to be implemented for 300 dams in 18 states across 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 – IDAMALAYAR DAM

Idamalayar Multipurpose Project is located at Ennakal near Bhoothathankettu on the Idamalayar River, a tributary of the Periyar River in Kerala. The Latitude and longitude of dam site are 10°13'18.85"N and 76°42'23.10"E respectively. The project was completed in year 1987. The project consists of hydropower plant with installed capacity of 75 MW having two units of 37.5 MW each with annual generation of about 380 GW-h. The dam is a gravity concrete structure with a total height of 102.40 m above the deepest foundation level with a length of 373 m at the crest level. The full Reservoir level is at EL 169 m and the minimum draw down level (MDDL) is at EL 115 m. The gross storage capacity of reservoir is 1.0898 billion cubic meter.

Irrigation benefits from the Idamalayar Reservoir is by utilizing the tail-race water released from the Idamalayar Power house. The tail race discharge from the Idamalayar powerhouse is picked up at the barrage constructed across the Periyar River at Bhoothathankettu and diverted through a canal system on the right bank of the barrage. The irrigation benefits envisaged covers an area of 14,394 hectares of wet and dry agricultural lands, out of which the cultivable command area is 13,209 hectares.

Salient features of the project area are reported below:

LOCATION	
State	Kerala
District	Ernakulam
River/ Basin	Idamalayar, a tributary of Periyar river
Nearest city and airport	Kothamangalam, Cochin International Airport
Nearest railhead	Aluva
Lat/Long	10° 13' 18"/76° 42' 23"
Type of project	Multi-purpose
Gross Command Area (GCA)	14394 ha
Cultivable Command Area (CCA)	13209 ha
Installed Capacity (MW)	75 MW
Average Annual Energy Generation (MU)	380 MU
Firm Power (MW):	43 MW
Domestic/Municipal/Industrial Water Supply	500 cusecs for domestic water supply and 1000 cusecs for salinity control in Periyar
Annual Water Supply (MCM):	1350 MCM
Main Dam	
Type	Concrete Gravity
Total length of main dam	373 m
Top width of Dam	8.5 m
Elevation of top of dam	172 m
Height of Masonry/Concrete Dam above deepest foundation level	102.4 m
Lowest River Bed Elevation	81 m
Deepest Foundation Elevation	69.96 m
Outlet works (In Embankment, Concrete & Masonry Dams)	
Location	Left bank
Number	2
Sill level	103.5 m
Size	1.5 m dia
Discharging Capacity	54.5 cumec
Spillway	
Type of Spillway	Ogee
Length of Spillway	60 m
Location of Spillway	CENTRAL SPILLWAY
Spillway Crest Level	161 m
Number of Bays	4
Type of Spillway Gate	Radial
Size of Spillway Gate	11.5 m wide * 9.7 m high
Total Discharging Capacity at MWL	3248 cumec
Reservoir	
Catchment Area at Dam site	472 sq km
Maximum Water Level	171 m
Full Reservoir Level	169 m
Minimum Draw Down Level	115 m
Gross Storage Capacity	1089.8 MCM
Live Storage Capacity	1017.8 MCM
Reservoir Spread Area	28.3 sq km
Date of Starting the Construction	1976
Date of Completion	1987
Original Inflow Design Peak Flood	3851 cumec
Maximum observed flood peak	1400 cumec on 16/08/2018
Revised Inflow Design Peak Flood	3908 cumec



Figure 1.1: View of dam from upstream



Figure 1.2: View of dam

1.3 PROPOSED INTERVENTIONS/ACTIVITIES AND INTENDED OUTCOMES

Dam Safety Review Panel (DSRP) constituted for DRIP Phase II, has made a visit to Idamalayar dam on 20/12/2019 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 DSRP recommendations and these proposals form the basis for preparation of present ESDD report.

Structural Rehabilitation Works

- Restoration of right bank training wall up to bucket portion
- Construction of Centralized control room
- Reaming of formed drain holes

Non Structural Measures

- Installation of Inflow forecasting system

Basic Facilities Enhancement

- Improvement to the access road to dam top
- Procurement of office Equipment

Instrumentation, SCADA, Surveillance system, etc.

- Installation of Accelerograph

Others

- Hydrographic Survey
- EAP (Tier II)
- Modernization of existing laboratory

Figures 1.3 and **1.4** provide photographs of key infrastructure proposed for rehabilitation works and also major interventions locations.



Requirement of roof top at hoist operating area



Radial gate-Yoke Girder- water deposit & rusting of Trunnion bolt



Chocked Rain water drain



Upstream face of the Dam



Damaged right side training wall

Figure 1.3: Selected Photographs of Improvement/Intervention area

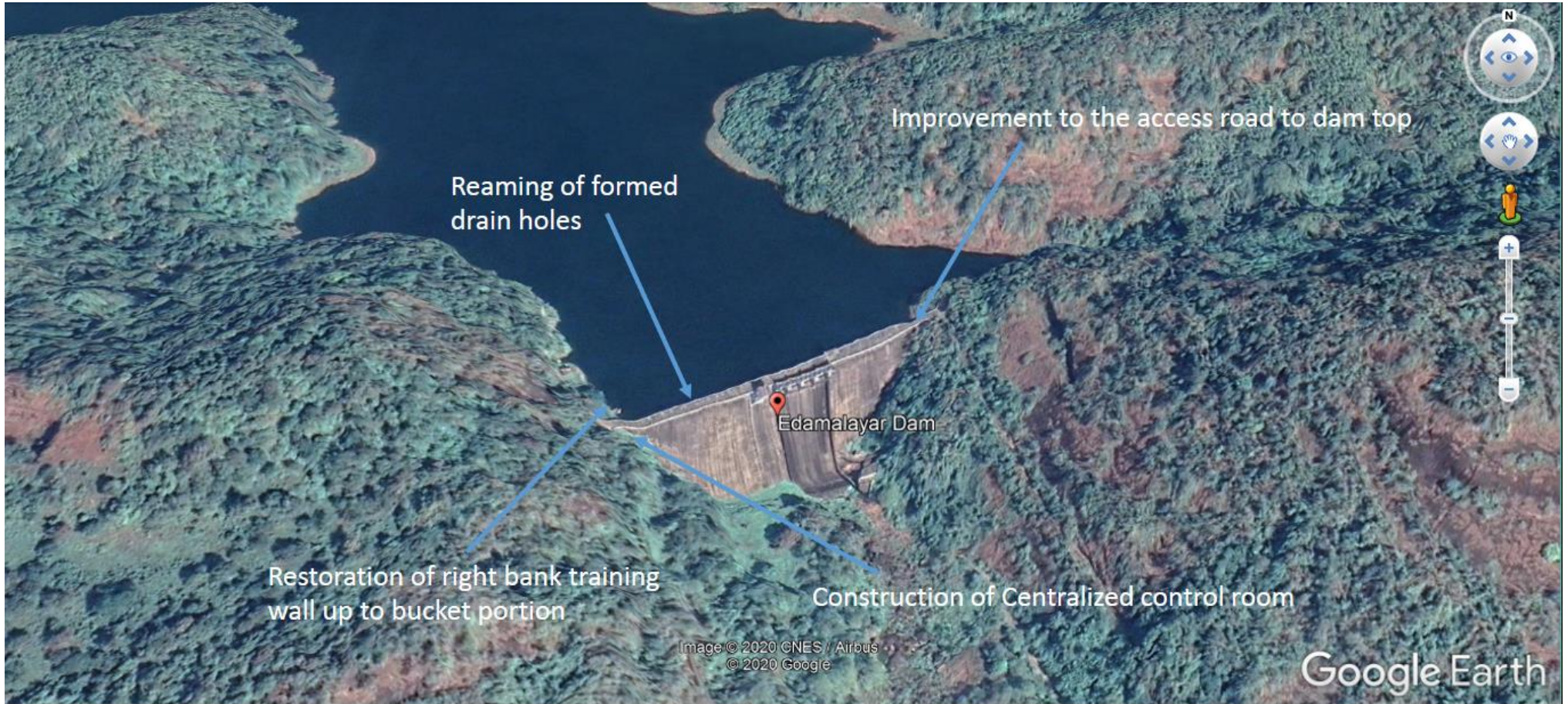


Figure 1.4: Project Area showing major intervention locations

1.4 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 24 months. SPMU/IA 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) : 01/10/2020

Proposed Ending of implementation (MM/DD/YYYY) : 30/09/2022

Implementation Duration (months) (MM) : 24 Months

b) Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	10/2020	03/2022	Procurement process will be initiated after obtaining approval of the PST from World Bank.
2	Other Packages	11/2020	04/2021	Procurement process will be initiated after obtaining approval of the PST from World Bank.
3	Procurement – instrumentation, goods, inspection vehicles	10/2020 – 09/2022		
4	Consultancy Contracts	10/2020 – 09/2021		

1.5 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.

1.6 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.

Stakeholder consultations with communities living downstream/vicinity of the dam, have been carried out in a limited way under the current circumstances due to COVID and these shall held as soon as situation is conducive for holding such consultations.

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 analysed. 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 regulations 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 requires diversion of forest land for non-forestry purposes. Wildlife Clearance process gets triggered if the project is in proximity to protected area or activities are proposed within protected areas (CA).

Therefore, for the proposed dam rehabilitation activities at Idalmalayar dam, which are limited to dam area and do not require any additional private or forest land and do not fall within any protected area; regulatory clearances will not be applicable as per Indian regulation.

2.2 DESCRIPTION OF INSTITUTIONAL FRAMEWORK

The sub-project will be implemented by the Dam Safety Organization of KSEBL. Chief Engineer (Civil - Dam Safety & DRIP) is responsible for the operation and maintenance of existing dams of KSEBL and to arrange necessary rehabilitation works in time to improve safety performance of dam and for ensuring the safety of people downstream. Works required improving the operational performance of the existing dams & their modernization etc. under KSEBL is also carried out by dam safety wing. Chief Engineer is assisted by a team of Engineers under the Project Director, SPMU. The field crew includes Executive Engineers,

Assistant Executive Engineers, Assistant Engineers & Sub Engineers. For the rehabilitation works whose estimate amount is beyond the delegation of the Chief Engineer, administrative sanction for the same is to be obtained from Board of Directors of KSEBL.

KSEBL do not have in-house expertise to address E&S issues. Presently, Chief Engineer at SPMU and Executive Engineer at field level look after these aspects. It is proposed that need based appointment of Environment and Social Experts to enable preparation of Environment Management Plans as well as for support in implementation of mitigation measures will be taken up. KSEBL will hire experts from outside department or seek deputation of staff with relevant experience to facilitate issues related to the environment and social aspect during implementation of the sub-project, under DRIP II.

SPMU 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.

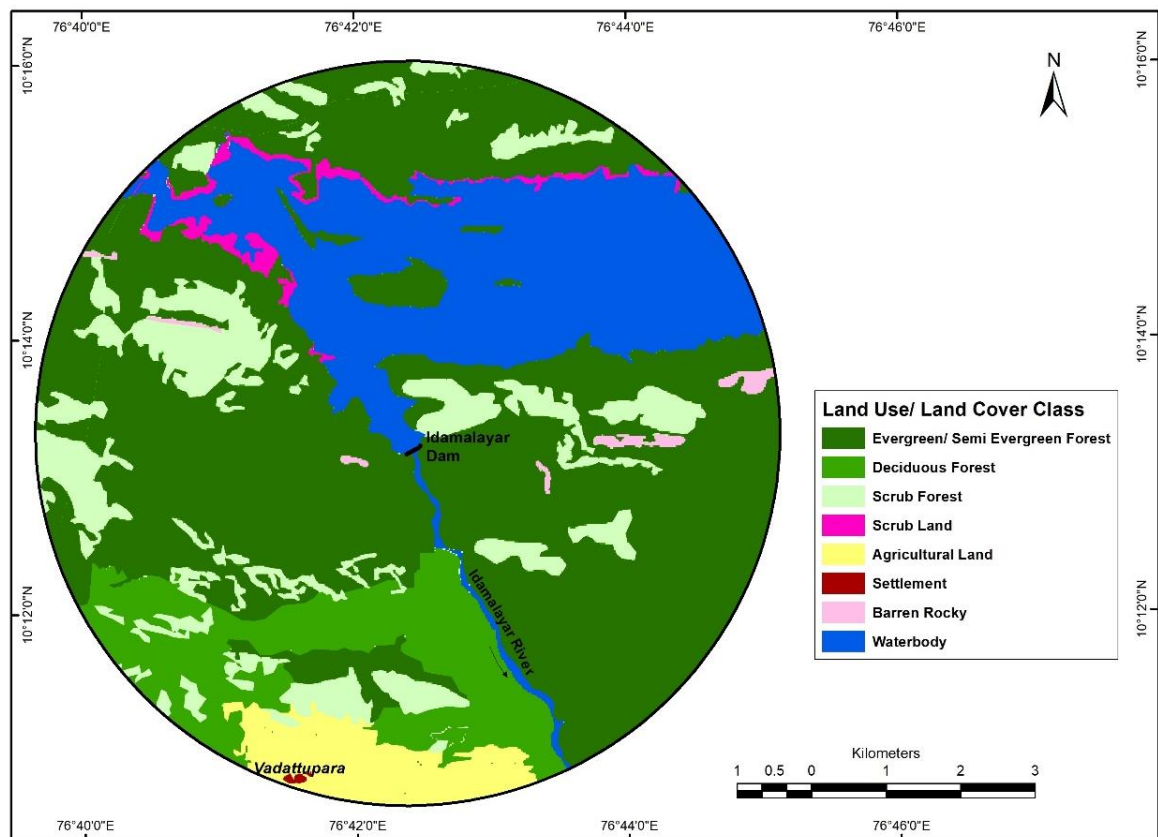
Presently, GRM & Internal complaint committee as per Sexual Harassment Act is there in KSEBL but not specific to SPMU or the Dam Safety Organization. A system specific to DSO will be introduced before commencing the execution of works at site. There is no internal complaint committee as per Sexual Harassment Act either at dam level, which will be implemented before start of work. A Grievance Redress Mechanism (GRM) will be established and operated by the contracted agencies to address Project workers workplace concerns before start of the work. SPMU will have oversight responsibility on the functioning of the GRM.

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's land use and environmental sensitivity was analyzed using Remote Sensing & 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 Evergreen/ Semi Evergreen Forest and waterbody (reservoir). In addition, there are small patches of deciduous forest, scrub forest, scrub, barren and agricultural land. Proposed rehabilitation work will be confined to dam area and no structural interventions are proposed beyond existing dam boundaries. Vadattupara is the only habitation identified in dam surrounding (within 5 km).



[(Source: Digital data on land use/land cover maps using bhuvan prepared by National Remote Sensing Centre (NRSC) with Kerala State Remote Sensing Environment 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. Design flood has been revised from 3851 cumec to 3908 cumec which is almost same i.e. just 1% increase.

Project falls in earth quake zone III as per Bureau of Indian Standards [IS 1893 (Part I):2002]. Seismic Design review of Idamalayar dam shall be carried out as per the recommendation of DSRP. Bureau of Indian Standards [IS 1893 (Part I):2002], has grouped the country into four seismic 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

Protected areas near Idamalayar dam have been reviewed to assess the applicability of ESS6. Dam is located outside of the periphery of buffer zone of Parambikulam Tigre Reserve. Shortest aerial distance from dam site to buffer zone is about 6.8 km. Tattedeked Bird Sanctuary, where Eco-sensitive Zone is also notified, distance of dam from eco-sensitive zone boundary (ESZ) of Tattedeked Bird Sanctuary is about 9 km.

The location of dam with respect to the periphery of buffer zone of Parambikulam Tigre Reserve eco-sensitive zone boundary (ESZ) of Tattedeked Bird Sanctuary is shown in the **Figure 3.2** below.

No rehabilitation work is proposed beyond the dam boundary, which can directly or indirectly impact the protected area.

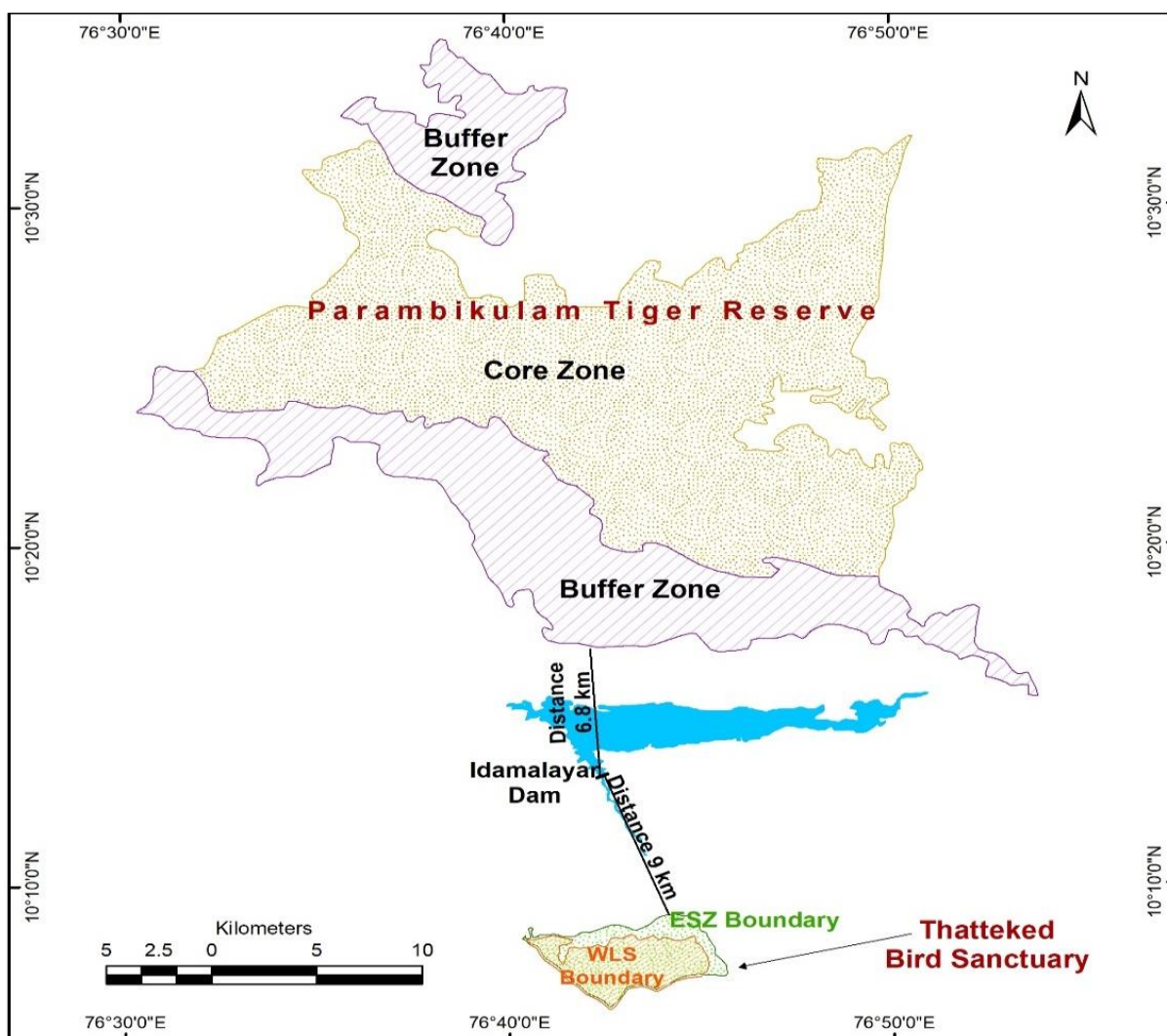


Figure 3.2: Map showing protected areas in vicinity of dam location

3.3 SOCIAL ENVIRONMENT

The Idamalayar dam is located in Ernakulam district in the state of Kerala. The habitations/settlements identified in the proximity i.e. habitations/villages which falls within 5 km distance from dam is only Vadattupara. There are no Schedule V¹ areas in Kerala. The district consists of two revenue divisions i.e. Muvattupuzha revenue division consisting of three tehsils (talukas) namely Kothamangalam, Muvattupuzha and Kunnathunad with 53 villages and Fort Kochi revenue division consisting of four tehsils (talukas) namely Aluva, Paravur, Kochi and Kanayannur with 71 villages.

The Ernakulam district may well be called the hub of industrialization in Kerala due to the presence of large, medium and small scale industries. The availability of infrastructure facilities like electricity, water, transportation via road, rail, water and air, long coastal line, banking facilities, proximity to Kochi Port, international airport etc. contributed substantially

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**.

for the industrial growth of the district. The High Court of Kerala is in this district. It is the only district in the state with a Jewish Synagogue. Fort Kochi in Ernakulam district is the oldest settlement area of Jews. The densely populated Ernakulam district embodies the achievements of the Kerala State in literacy, industry, trade and commerce. With an inclusive culture, relatively high per capita income and an unstoppable interest of the people in updating themselves of the political, economic, social and cultural happenings in the national and international spheres, Ernakulam represents the high modern phase of the Kerala society. The brief demographic characteristic of the district is given in the table below:

No. of Households	814,011	Household Size	4
Total Population	3,282,388	Population (0-6 age)	304,242
Male	1,619,557	Boys (0-6 age)	155,182
Female	1,662,831	Girls (0-6 age)	149,060
Sex Ratio	1,027	Sex Ratio (0-6)	961
Population (SC)	268,411 (8.18%)	Population (ST)	16,559 (0.50%)
Male	131,573	Male	8,349
Female	136,838	Female	8,210
Literates	2,855,676	Literacy Rate (in %)	95.89
Male	1,425,723	Male	97.36
Female	1,429,953	Female	94.46
No. of Workers	1,249,343	Cultivators	50,423 (4.04%)
Male	913,249	Agricultural Labours	71,391 (5.71%)
Female	336,094	Household Industrial Workers	23,976 (1.92%)
No. of Main Workers	1,061,388	Other Workers	1,103,553 (88.33%)
No. of Marginal Workers	187,955		

Source: Census of India, 2011 (District Handbook)

There are very few scheduled tribe households in the district (0.5%). They are mainstreamed in the area and do not possess any characteristics as outlined in ESS7. There are no physical interventions planned outside the dam. Any ST households in the downstream area will be taken into account during the preparation of Emergency Action Plan for Idamalayar Dam.

3.4 CULTURAL ENVIRONMENT

No monument of National Importance as designated by Archaeological Survey of India (ASI) is located besides Idamalayar Dam.

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 most 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 chemicals, 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. Activities involving machinery and equipment will have impacts on physical environment. 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’s 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.

Emergency Action Plan, Early Warning System and Flood Forecasting System, etc. would be required to be prepared. In that case, project will reach out to the disadvantaged and vulnerable persons and groups and involve them mainly during implementation. 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 further 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 general rehabilitation work as Low risk activities, whereas Labour Camp and Debris Disposal is categorised as Moderate risk.

E&S risks of none of the sub-activities for this sub-project is categorized as either 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. Based on consideration of all the above, summary of Risk/Impact (as per outcome of SF-2) is summarised for major sub-project activities under **Table 4.1 below.**

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

Project Activity	Environment Risks						Social Risks				
	Air, water, noise, land use, Soil, Resource use	Pollution downstream and upstream	General Ecology	Protected Area (Wild Life Sanctuaries, National Park and other natural habitat even if not protected)	Other RET species (flora and fauna) outside protected areas	Fish and Aquatic life within dam water body	Land	Tribal	Labour	Cultural heritage	GBV/SEAH
Civil (within Dam Boundary)	L	L	L	None	None	L	L	L	M	None	L
Hydro Mechanical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Instrumental SCADA, surveillance	L	L	L	None	None	L	L	L	L	None	L
Painting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road work	L	L	L	None	None	L	L	L	M	None	L
Safety measures (Siren, Lighting)	L	L	L	None	None	L	L	L	L	None	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	L	L	L	None	None	L	L	L	L	L	L
Additional activities for Tourism /Solar/Fisheries/ Water recreation enhancement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Criteria for Risk Evaluation:

Low: Localized, temporary and Negligible

Moderate: temporary, or short term and reversible under control

Substantial: medium term, covering larger impact zone, partially reversible

High: significant, non-reversible, long term and can only be contained/compensated

Occupational Health and safety: OHS is a substantial risk activity in almost all cases and is being treated separately through OHS plan in accordance with WB ESHS guidelines and shall be applicable to all sub-projects. Hence is not being considered under screening criteria.

4.2 STAKEHOLDER CONSULTATION

Stakeholder consultation was conducted as part of environmental and social due diligence. The purpose was to;

- a. provide initial information to the communities on the proposed project interventions and particularly the non-structural interventions;
- b. Help identify potential stakeholders who are involved at this stage and will be involved a later stage.
- c. Ascertain if there are any legacy issues relating to displacement, resettlement, etc.
- d. elicit their responses in relation to key non-structural interventions such as early warning systems, emergency action plans
- e. Identify mechanisms that would be deployed to engage with different stakeholders and particularly communities living downstream.

Stakeholder consultation was conducted on 18th May 2020 ensuring social distancing. It was attended by permanent staff of KSEBL working at dam, local people living in the nearby area, workers of contractor executing certain rehabilitation works at dam site, contractor's representative etc. The work proposed to be carried out for the dam was explained to them.



Figure 4.1: Consultation with Villagers at site where rehabilitation of access road to dam is proposed

Following is the outcome of the stakeholder consultation meeting:

1. Agriculture, Fishing, Collection of forest produces etc. are the main occupation of people in the nearby area.
2. Contract workers generally work for 3-4 months on dam in a year and carry out repair and maintenance activities
3. All the participants welcomed the proposed interventions relating to dam safety.
4. The dam was constructed in 1987. There are no pending issues regarding dam construction related resettlement
5. The participants explicitly mentioned that the dam is their lifeline and strengthening works will help their long-term livelihood and therefore welcomed such information

6. Participants have expressed that they do not have any grievances and as such no grievances were ever reported from their communities/neighbourhoods

Communities welcomed such interactions and indicated that they would prefer Dam authorities conduct one such face-to-face meeting, once a month at a convenient location to inform of developments/interventions relevant to them. They welcomed other means of information such as advertisements in the local papers etc, but preferred to have face to face interactions at least once a month.

Interactions made with Engineers and local communities is tabulated below;

A. Interaction with Dam Engineers/Staff

Questions	Responses 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 stakeholders consultation meetings planned for dissemination of emergency action plans which is a non-structural measure.	Proposed rehabilitation activities lie within dam premises. There is no possibility of local community's interference. Emergency action plans are prepared and published in the website of CWC.
2. Is there any unsettled issues (legacy) related to displacement or resettlement, pending since time of dam construction? If yes, please give a brief detail.	There are no unsettled issues regarding displacement or resettlement.
3. Any unauthorized encroachers or squatters living within the dam premise? If yes, are these not a threat for dam 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 of dam authorities.	There is neither encroachment nor squatters living within dam premises.
4. What is the proposed institutional arrangement to deal the Environment and Social activities within the scheme i.e. in-house team of experts/hired agency or individual experts?	The project authority would be dealing with the issues of environment and social activities.
5. Who will be in charge of E&S related activities at dam site and at SPMU level?	Smt. Susamma, Assistant Executive Engineer posted at dam site shall be in charge for E&S at dam site. At SPMU level, Sri James Willson, Assistant Executive Engineer is the in charge officer.
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 contact dam officers in person or through mobiles as the concerned officers reside near the dam premises.

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 authorities/ telephone/mobile/text messages or any other mode of communication?	Written communication with district revenue authorities is made and with mobile messages. Siren is used to alert at dam site.
8. How do you ensure that downstream community is fully aware of the above existing mechanism?	As the construction of dam is 33 year old and downstream community is now accustomed with the procedure.
9. Are there women employees at the dam site?	Yes.
10. Is there any existing Grievance Redressal Mechanism (GRM) within the department to address any kind of grievance/complaints by general public?	Yes. any public grievance brought to the notice of the project authorities is promptly dealt with.
11. Details of any grievances received lately related to this new Scheme?	None.
12. Is dam premise a restricted area or has open access to general public?	Access is restricted.
13. Are there tribal's living in the surrounding area of dam complex? Which tribes are these? Please give brief detail.	No.
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.	No.
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?	Yes. On contract basis.

B. Interaction with Local Community

Questions	Responses provided / Observations
1. How many villages are in immediate downstream vicinity?	3 Nos. villages are in immediate D/S vicinity.
2. Are they dependent on dam in any way for their livelihood?	No.
3. Does any of these villages were displaced and rehabilitated during the construction of the Dam. Is there any pending compensation issues?	No
4. Is there any R&R affected person known to you who is currently working with the dam authorities? If so, in what capacity (employee/direct worker/contractor)	No.

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.	KSEBL is not concerned with fishery activities.
7. Are you aware of local women affected in any way by dam operations?	No such issue has arisen.
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?	Siren of high amplitude is available and regular updates to D/S with the help of revenue department.
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 such Incident occurred.
10. If you have to contact the dam authorities; how will you contact, through telephone/mobile/e mail/personally?	Through Telephone, mobile or by personal means.
11. In the past, on any occasion, did you contact dam authorities for any specific reason affecting public in general? If so, how did you contact and how was the response of dam authority?	No such occasion occurred.
12. Give your views about the dam, how this dam is helping Country, State, district or local communities in meeting its objectives, any specific concern can also be given?	The dam is constructed as part of Idamalayar Hydro Electric Project generating 75 MW of Power to Kerala Grid. In addition to it, the tail water is utilised for irrigation and drinking water supply.
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 about various protocols in place and consequences in case dam fails? (c) In future, during stakeholder's consultation meeting, would you like to be a part of these consultation and mock drill activities to be conducted by dam authorities? (d) If yes, how to contact you, please give the corresponding address along with all details to receive the official communication.	Yes. Yes, consultation meeting conducted. Yes Through mobile phone.
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?	No, Occasionally.

15. Any suggestion to improve overall system by dam authorities in any way, please give in brief?	Access road is to be improved.
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4.3 DESCRIPTIVE SUMMARY OF RISKS AND IMPACTS FROM ACTIVITIES 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 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 work within dam body will generate localised impacts on physical environment and resource use; pose risk of exposure of workers requiring personal protective equipment (PPE) use.
3. Civil work interfaced with water body may pose risk of water pollution and impact on fish fauna.
4. Construction waste and debris/muck from development, require careful disposal at pre-identified and approved site to minimise the risk of pollution on this count.
5. No significant 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 Impacts and Risks

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. Though there are Scheduled Tribes households in the vicinity, these are mainstreamed into the overall society and do not meet the characteristics outlined in ESS 7. There will be no physical interventions.
3. Influx of migrant labour will be low as these works require only few but very skilled labour. Also, 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 no such sites are identified in project vicinity.
6. Labour related risk would include:
 - Safety issues while at work like injuries/accidents/ fatalities leading to even death, while at work; Occupational health and safety risks due to exposure of workers to unsafe conditions while working at heights, working using lifts, handling of

equipment and machinery, exposure to air and noise pollution etc. will be addressed through OHS guidelines.

- Short terms effects due to exposure to dust and noise levels, while at work
- Long term effects on life due to exposure to chemical /hazardous wastes
- Inadequate accommodation facilities at work force camp, including inadequate sanitation and health facilities
- Sexual harassment at work
- Absence or inadequate or inaccessible emergency response system for rescue of labour/workforce in situations of natural calamities.
- Health risks of labour relating to HIV/AIDS and other sexually transmitted diseases
- Non-payment of wages
- Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
- Unclear terms and conditions of employment
- Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
- Denial for workers' rights to form worker's organizations, etc.
- Absence of a grievance mechanism for labour to seek redressal of their grievances/issues

5.1 CONCLUSIONS

5.1.1 Risk Classification

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Physical Environment, labour and SEAH/GBV. The summarised environmental and social risks of identified activities with level of risk is presented in previous chapter. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. Environment risks of air, water, noise, land use, soil and resource use for activities are Low whereas social risks of labour to labour/community are Moderate. Environment risks are categorized as Low for all rehabilitation works. Environmental risk relating to Labour camp has been flagged as Moderate on environment and land.

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 legislation 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 5.2: 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 measures e.g. implementation of 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 5.3: 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	<ul style="list-style-type: none"> • Gender Based Violence or SEA/SH related actions 	SPMU/IA	Before mobilization of contractor
ESS2: Labour and Working Conditions	<ul style="list-style-type: none"> • Labour Management Procedure (LMP) including OHS management plan 	SPMU/IA	Before mobilization of contractor
ESS3: Resource Efficiency, Pollution Prevention and Management	<ul style="list-style-type: none"> • Pollution Prevention and Environment Quality Management Plan (PPEQMP) 	SPMU/IA	Before mobilization of contractor
ESS 4: Community Health and Safety	<ul style="list-style-type: none"> • Community Health and Safety Management Plan (CHSMP) 	SPMU/IA	Before mobilization of contractor
ESS 10: Stakeholder Engagement Plan	<ul style="list-style-type: none"> • 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 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 restoration of right bank training wall up to bucket portion etc.)	A	DI	WQ, PE, L, G
5	Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir) like construction of control room, improvement of access road to dam top etc	A	DI	PE, L, G
6	Re-sectioning earth dams to safe, stable cross sections	NA		
7	Hydro-mechanical activities with interface with dam reservoir	NA		
8	Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)	NA		
9	Instrumentation, General lighting and SCADA systems	A	DI	PE, L, G
10	Basic Facilities (like access road improvement, renovation of office, etc)	A	DE	PE, L, G
11	Utility installation like standby generator, or setting up solar power systems	NA		
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			

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	DE	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		

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	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	Restoration of right bank training wall up to bucket portion	WQ, PE, L, G	Air pollution, noise pollution, risk of reservoir water contamination, generation of construction debris, Labour and GBV risk	L
b	Reaming of formed drain holes	WQ, L, G	Risk of reservoir water contamination, 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 of Centralized control room	PE, L, G	Air pollution, noise pollution, Labour & GBV risk	L
b	Improvement to the access road to dam top	PE, L, G	Air pollution, noise pollution, construction debris, , Labour and GBV risk	L
c	Modernization of existing laboratory	PE, L, G	Air pollution, noise pollution, construction debris, Labour and GBV risk	L
3	Instrumentation, General lighting and SCADA systems			
a	Installation of Accelerograph	PE, L	Waste from packing material, Labour risk	L
4	Basic Facilities Enhancement			
a	Procurement of office equipment	PE, L	Waste from packing material, Labour 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 hoists and for	L

			other activities - risk due to machine handling, waste, wastewater and air emissions from machines operations, hazardous waste generation from oil waste	
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 dewatering - risk due to machine handling, waste generation, wastewater and air emissions from operations, hazardous waste generation from oil waste, Labour and GBV risks	L
4	Disposal of large amount of Debris	PE, L, G	Debris will be generated from various repair activities, 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	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

Sl. No.	Name of Participant	Address
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6	Biju N.V	Narakathumkudiyil (H), Vadattupara P.O, Ph. 8547620581
7	Arun P.M	Podimattathil (H), Vadattupara P.O, Ph. 9744675261
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10	Nikhil Sabu	Payyabpillil (H), Neelamperoor P.O, Ph. 9400906553
11	Sreekala	Mundackal (H), Vadattupara P.O, Ph. 9947198215
12	Shyni	Kunnathettu (H), Vadattupara P.O, Ph. 974799860
14	Adam. N.P, Asst. Engineer, KSEBL	Dam Safety Division, Idamalayar