

DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP) Phase II

(Funded by World Bank)

PORINGALKUTHU DAM

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT – PART A (PIC:KL29HH0006)



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KERALA STATE ELECTRICITY BOARD LIMITED

**Chief Engineer (Civil – Dam Safety & DRIP)
Dam Safety Organization, Pallom, Kottayam
Kerala. Email : cedamsafety@gmail.com**

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ABBREVIATIONS AND ACRONYMS

AIDS	:	Acquired Immunodeficiency Syndrome
BOQ	:	Bill of Quantities
CA	:	Conservation Area
COVID	:	Coronavirus Disease
CWC	:	Central Water Commission
DE	:	Beyond Dam Area
DI	:	Within Dam Area
DRIP	:	Dam Rehabilitation and Improvement Project
DSRP	:	Dam Safety Review Panel
DSO	:	Dam Safety Organization
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
GIS	:	Geographic Information System
GRM	:	Grievance Redressal Mechanism
HIV	:	Human Immunodeficiency Virus
IA	:	Implementation Agency
IPF	:	Investment Project Financing
LMP	:	Labour Management Procedure
MCM	:	Million Cubic Meters
MDDL	:	Minimum Draw Down Level
MW	:	Megawatt
MWL	:	Maximum Water Level
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PAP	:	Project Affected Person
PDO	:	Project Development Objective
PE	:	Physical Environment
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
RET	:	Rare Endangered and Threatened
SC	:	Scheduled Castes
SCADA	:	Supervisory Control and Data Acquisition
SEA	:	Sexual Exploitation and Abuse
SEAH	:	Sexual Exploitation Abuse and Harassment
SEP	:	Stakeholder Engagement Plan
SF	:	Screening Format

SH : Sexual Harassment
SPMU : State Project Management Unit
ST : Scheduled Tribes
WB : World Bank
WQ : Water Quality

EXECUTIVE SUMMARY

Poringalkuthu is a gravity masonry dam, built in 1957 across Chalakudy river in Thrissur district of Kerala to generate hydropower with 48 MW installed capacity. The project operator, KSEB, has proposed to undertake rehabilitation measures (structural, non-structural, instrumentation and basic facility enhancement) under the proposed Dam Rehabilitation and Improvement Project (DRIP II) with a view to increase the safety and to strengthen dam safety management.

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

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

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Fisheries, Physical Environment, labour and SEAH/GBV. Environment risks of air, water, noise, and resource use as well as social risks of labour, civil work within the dam body and road work are Moderate. Similarly, environment and social risk of labour camp and disposal of debris has been identified as moderate. Risk of all other activities has been identified as Low. 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\$26.84million);

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

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

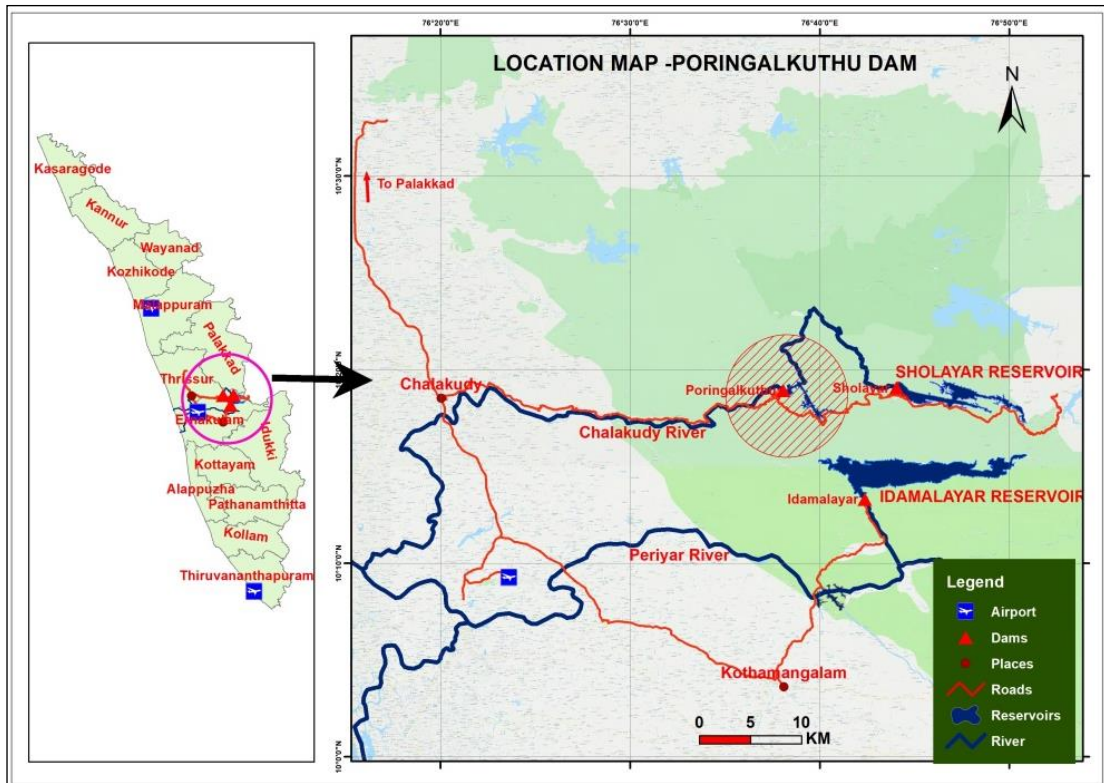
The primary beneficiaries of the project are the communities that live in dam breach flood inundation areas and the communities that depend on water, irrigation and electricity services provided by the dams that could be compromised by poor dam performance or failure. In addition to saving lives, improved 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 – PORINGALKUTHU DAM

Poringalkuthu reservoir is formed by constructing a dam across Chalakudy river in Thrissur district of Kerala. The construction of dam was completed in year 1957. The dam is a gravity masonry dam. The spillway consists of 7 numbers of dropping type gates of size 11.58 m x 5.94 m each and 4 numbers of sluice gates of size 2.44 m x 5.77 m each. The water from the reservoir is directed through a tunnel to generate hydropower. The total installed capacity of the project is 48 MW. The average annual generation of the power station is about 244 MU. The water used for power generation is 36 cumec. A diversion is also provided at Vachumaram to Idamlayar reservoir having a discharging capacity of 39.43 cumec when WL in the reservoir is at EL 422.40 m. The total catchment area of Chalakudy river at Poringalkuthu dam site is 1007 sq km, out of which 512 sq km is the free catchment. The FRL and MDDL of reservoir are at EL 423.98 m and 405.69 m respectively. The gross storage capacity of reservoir at FRL is 32 MCM. The height of dam above deepest foundation level is 36.88 m, while the height of dam above river bed level is 26.24 m. The top of dam is at EL 425.5 m. The length of dam at top is 365.76 m. The length of spillway portion of dam is 98.6 m. The spillway is Ogee type with crest at EL 419.4 m. Length of

sluice section is 38.10 m with sill at EL 400.20 m. The Poringalkuthu dam was designed for a flood discharge of 2265 cumec. During August 2018 flood of Kerala, the dam was overtopped for about 26 hour. The maximum observed discharge at Arangaly G&D site of CWC (about 55 km downstream of dam site) on 16 August 2018, 8 AM was about 2900 cumec.

Location map of the project is shown below:



Salient features of the project area are reported below:

LOCATION	
State	Kerala
District	THRISSUR
River/ Basin	CHALAKUDY
Nearest city and airport	CHALAKUDY, COCHIN INTERNATIONAL AIRPORT
Nearest railhead	CHALAKUDY
Lat/Long	10 ^o 18' 55"/76 ^o 38' 04"
Type of project	HYDRO POWER
Installed Capacity (MW)	48 MW
Average Annual Energy Generation (MU)	244 MU
Firm Power (MW):	28 MW
Main Dam	
Type	Masonry Gravity
Total length of main dam	365.76 m
Top width of Dam	4.72 m
Elevation of top of dam	425.5
Height of Masonry/Concrete Dam above deepest foundation level	36.88 m
Lowest River Bed Elevation	399.26 m
Deepest Foundation Elevation	388.62 m

Outlet works (In Embankment, Concrete & Masonry Dams)	
Location	Block No. 11
Number	4
Sill level	400.20
Size	2.44 m wide * 5.77 m high
Discharging Capacity	800 cumec
Spillway	
Type of Spillway	Ogee
Length of Spillway	98.6 m
Location of Spillway	CENTRAL SPILLWAY
Spillway Crest Level	419.4 m
Number of Bays	7
Type of Spillway Gate	Vertical lift
Size of Spillway Gate	11.58 m wide * 5.94 m high
Total Discharging Capacity at MWL	1400 cumec
Reservoir	
Catchment Area at Dam site	1007 sq km
Maximum Water Level	423.98 m
Full Reservoir Level	423.98 m
Minimum Draw Down Level	405.69 m
Gross Storage Capacity	32 MCM
Live Storage Capacity	30.3 MCM
Reservoir Spread Area	2.82 sq km
Date of Starting the Construction	Not available
Date of Completion	1957
Original Inflow Design Peak Flood	2265 cumec
Maximum observed flood peak	2900 cumec on 16/08/2018
Revised Inflow Design Peak Flood	5700 cumec



View of Dam from Upstream

Proposed Interventions/ Activities and intended Outcomes

Dam Safety Review Panel (DSRP) constituted for DRIP Phase II, has made a visit to Poringalkuthu dam on 16/12/2019 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 Project Screening Template have been formulated based on DSRP recommendations and these proposals form the basis for preparation of the present ESDD report.

Structural Rehabilitation Measures

- 1 Strengthening of Poringalkuthu Dam by providing concrete mass at downstream face
- 2 Pointing of deteriorated masonry joints at upstream face
- 3 Curtain grouting of Poringalkuthu Dam
- 4 Construction of protection wall in the downstream of block 1 & rectification of damaged access road to dam top.
- 5 Repair works to Spillway bucket & vertical face of bucket
- 6 Repairs to Parapet wall & light post
- 7 Replacement of 2 nos. sluice Gates
- 8 Maintenance to Hoist Mechanism
- 9 Replacement of Emergency Gate filling valve
- 10 Providing regulatory arrangement for water discharge from 15 cm pipe at downstream portion
- 11 Providing cable tray for fixing power cables at spillway Hoist Platform

Non Structural Measures

- 1 Integrated Reservoir Operation

Basic Facilities Enhancement

- 1 Procurement of office equipment and survey equipment

Instrumentation, SCADA, Surveillance system, etc.

- 1 Installation of Accelerographs (3 Nos.)
- 2 Installation of Inflow forecasting & Early warning system

Other Works

- 1 Hydrographic Survey
- 2 Preparation of EAP (Tier II)
- 3 Geophysical Investigation
- 4 Testing of materials
- 5 Site specific seismic parameter estimation
- 6 Conducting Model studies for construction of additional spillway
- 7 Geological studies
- 8 Preparation of built-up drawings
- 9 Other investigations

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



Eroded foundation portion at downstream face



Damaged portion of Access road to dam top



Damaged training wall



Eroded portion of d/s side abutment at left bank of dam



Damaged portion of the abutment at d/s side of dam



Damaged foundation at downstream

Figure 1.1: Selected Photographs of Improvement/Intervention are

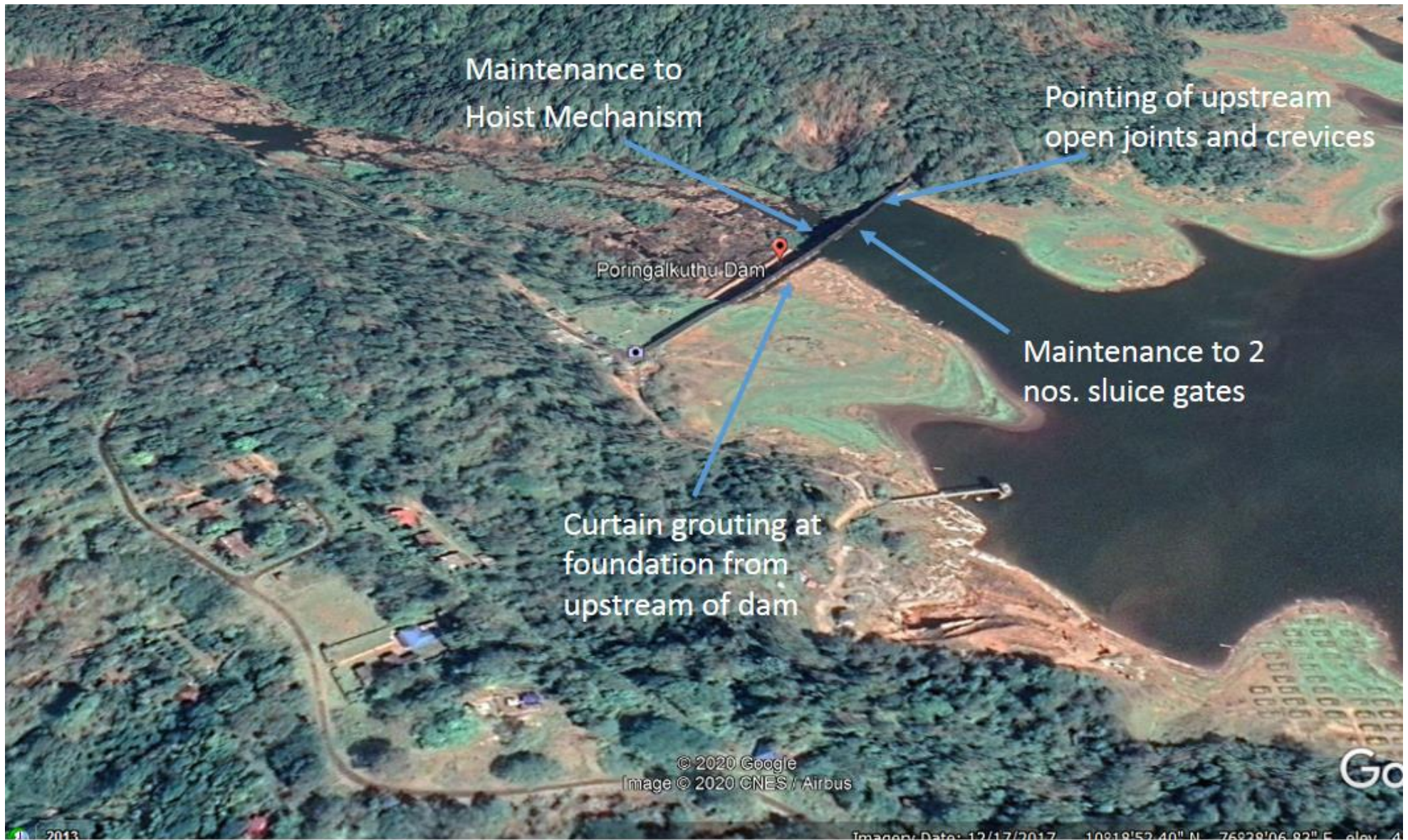


Figure 1.2: Project Area showing major intervention locations

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. 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): 01/08/2020
Proposed Ending of implementation (MM/DD/YYYY): 31/01/2023
Implementation Duration (months) (MM): 30 months

- b) Timeline phasing of implementation:

Sl. No.	Description	From (Month/Year)	To (Month/Year)
1	Civil Work – Main Package	08/2020	01/2023
2	Other Packages	08/2020	11/2021
3	Procurement of Goods	09/2020	03/2022
4	Consultancy Contracts	10/2020	12/2021

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.

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 Poringalkuthu dam, which are limited to dam area and does not involve any forest or protected area; regulatory clearances will not be applicable.

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 to improve 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 to appoint an E&S expert in SPMU to assist KSEBL in E&S activities of DRIP Phase II.

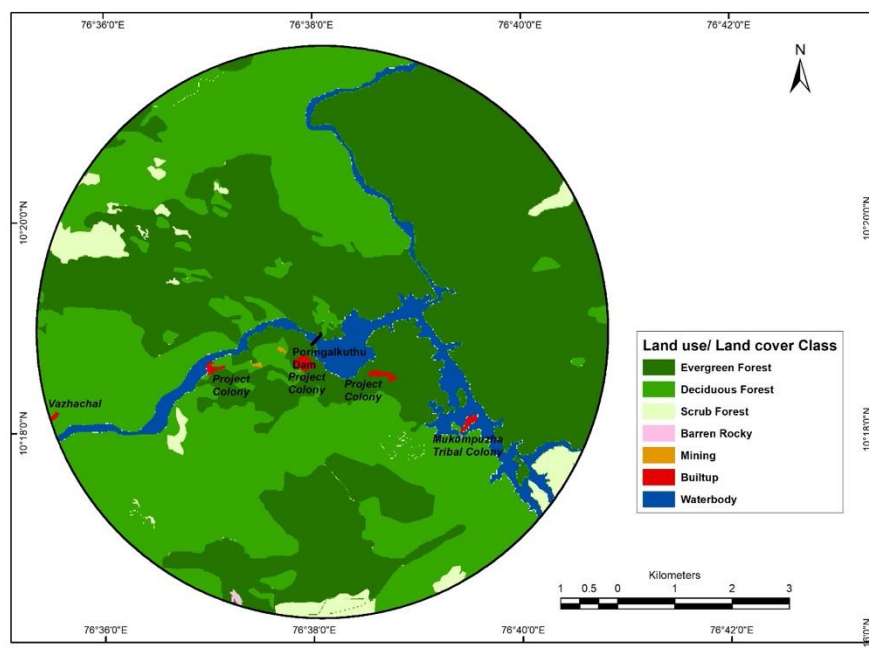
Presently, GRM & Internal complaint committee as per Sexual Harassment Act is there in KSEBL but not specific to SPMU or the Dam Safety Organization. A system specific to DSO will be introduced before commencing the execution of works at site. As committed in ESCP, a Grievance Redress Mechanism (GRM) 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.

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, evergreen and deciduous forests dominate the land use in project surrounding area along with water body (river & reservoir). There are small patches of scrub forest in surroundings. Proposed rehabilitation work will be confined to dam area and no structural interventions are proposed beyond existing dam boundaries except for training walls of proposed additional spillway, which are immediate downstream of the dam. The habitations/settlements identified in the proximity are Vazhachal, Mukumpuzha Tribal Colony and Project Colony. The dam is located in forest area. 24 No. of tribal houses are located on the left bank of river about 300 m downstream of dam. Number of people living in this settlement is about 170.



[(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 has been assessed.

The largest flood recorded since the construction of Dam in 1957 was in 2018. The dam overtopped in 2018 flood. Flood studies were revised by CWC. The revised design flood was increased considerably and recommended to provide an additional spillway to release the excess flood. Tier I EAP of the dam has been prepared and approved by the CWC.

Project falls in earth quake zone III as per Bureau of Indian Standards [IS 1893 (Part I):2002]. Seismic Design review of Poringalkuthu dam has been carried out as per the recommendation of Panel of Experts constituted to evaluate the safety of Poringalkuthu dam consequent to overtopping occurred during 2018 Kerala Flood, with the assistance of CWC during 2020 based on the parameters as per BIS.

Rehabilitation works to take care of revised design flood and change in the seismic zone is included in DRIP Phase II to ensure safety against natural hazards.

3.2 PROTECTED AREA

Protected areas near Poringalkuthu dam have been reviewed to assess the applicability of ESS6. Dam is in Vazhachal Forest Division located outside of the periphery of buffer zone of Parambikulam Tigre Reserve. Shortest aerial distance from dam site to buffer zone is about 2.7 km. The location of dam with respect to the periphery of buffer zone of Parambikulam Tigre Reserve is shown in the Figure 3.2 below.

Dam construction was completed in 1957, whereas Parambikulam Tigre Reserve was notified in 2009. Government of Kerala notified an extent of 390.89 square kilometres as core area of Parambikulam Tiger Reserve on 16 December 2009, which includes 245.12 square kilometres of Parambikulam Wildlife Sanctuary and an extent of 252.77 square kilometre as buffer zone. Parambikulam Tiger Reserve supports diverse habitat types like evergreen forests, semi evergreen forests, moist and dry deciduous and shola forests and the sanctuary also has unique habitats like montane grasslands and marshy grasslands known as vayals; and supports healthy population of several endangered wild animals including Tiger, Asian elephant, spotted deer, sambar, mouse deer and barking deer, gaur, nilgiri tahr, lion-tailed macaques, Malabar giant squirrel, flying squirrel and 273 species of birds.

As can be seen from Figure 3.2, the tiger reserve core area is further protected by a buffer zone towards the dam and dam fall outside the buffer zone. No significant movement of wildlife from core area to dam has been observed. Rehabilitation work is not sufficient distance away and is not expected to impact the protected habitat. No rehabilitation work is proposed beyond the dam boundary, which can directly or indirectly impact the protected area and no material movement is through the protected area; hence there ESS6 will not be triggered. Further, there is no restriction on carrying out rehabilitation work at dam due to proximity to tiger reserve. No permission or clearance would be required from Wildlife angle to carry out any of the proposed rehabilitation work at Poringalkuthu dam.

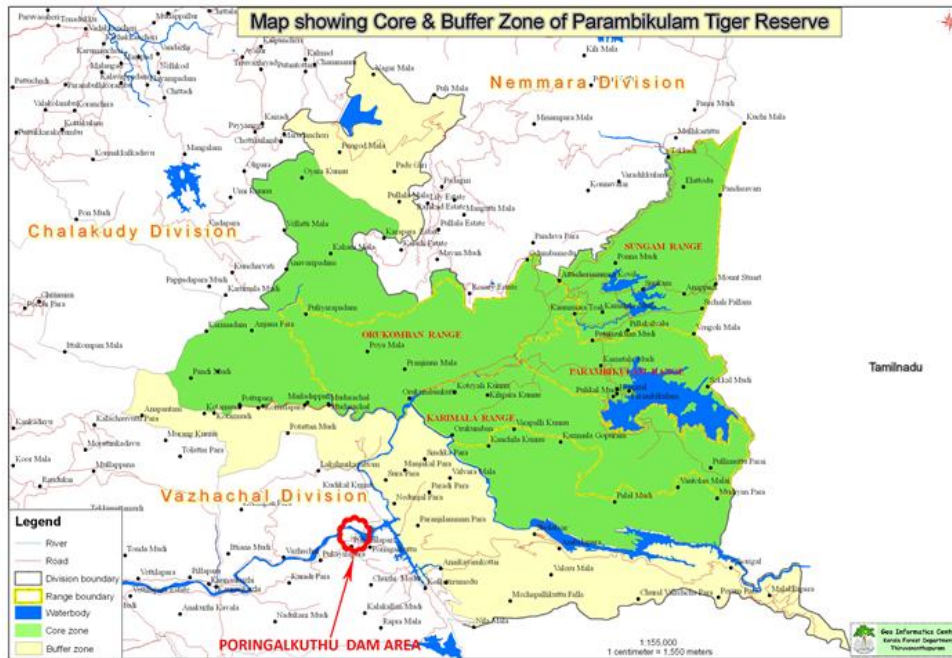


Figure 3.2 : Dam Location wrt Buffer Zone of Parambikulam Tigre Reserve

3.3 SOCIAL ENVIRONMENT

The Poringalkuthu dam is located in Thrissur 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 are Vazhachal, Mukumpuzha Tribal Colony and Project Colony. There are no Schedule V¹ areas in Kerala. The district comprises of a single revenue division i.e. Thrissur, consisting of five tehsils (talukas) namely Talappilly, Chavakkad, Thrissur, Kodungallur, Mukundapuram and 254 villages.

Thrissur district occupies the pride of place in the country in the manufacture of gold ornaments and jewellery. There are hundreds of jewellery shops in the district. The economy of the district is mainly dependent on non-agricultural resources. Thrissur is known as the cultural capital of Kerala-Kerala Kalamandalam at Cheruthuruthy, Kerala Sahitya Academy, Kerala Sangeetha Nataka Academy, Kerala Lalithakala Academy, Institute of Fine Arts, Unnayi Warriar Smaraka Kalanilayam are located here.

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

No. of Households	759,210	Household Size	04
Total Population	3,121,200	Population (0-6 age)	303,950
Male	1,480,763	Boys (0-6 age)	155,862
Female	1,640,437	Girls (0-6 age)	148,088
Sex Ratio	1,108	Sex Ratio (0-6)	950
Population (SC)	324,350 (10.39%)	Population (ST)	9,430 (0.30%)
Male	156,480	Male	4,362
Female	167,870	Female	5,068

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**.

Literates	2,678,548	Literacy Rate (in %)	95.08
Male	1,282,261	Male	96.78
Female	1,396,287	Female	93.56
No. of Workers	1,095,727	Cultivators	41,786 (3.81%)
Male	789,511	Agricultural Labours	73,941 (6.75%)
Female	306,216	Household Industrial Workers	27,883 (2.54%)
No. of Main Workers	929,506	Other Workers	952,117 (86.89%)
No. of Marginal Workers	166,221		
<i>Source: Census of India, 2011 (District Handbook)</i>			

There are very few scheduled tribe households in the district (0.3%). 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 households in the downstream area will be taken into account during the preparation of Emergency Action Plan for Poringalkuthu Dam.

3.4 CULTURAL ENVIRONMENT

No monument of National Importance as designated by Archaeological Survey of India (ASI) is located besides Poringalkuthu 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 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. There will not be change in flow pattern or water availability in the downstream reaches. There will be no change in the flow behavior upstream of dam as there is no increase in dam height or no increase in storage or no increase in submergence area.

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 outside 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 don'ts during such scenarios.

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

Step II Screening (using Form SF-2): All applicable activities identified as having potential risks/impacts that were identified through Step I screening, are 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.

- Strengthening of Poringalkuthu Dam by providing concrete mass at downstream face
- Curtain grouting of Poringalkuthu Dam
- Construction of protection wall in the downstream of block 1 & rectification of damaged access road to dam top
- Labour Camps involved (location within dam premises or outside)
- Major Debris Disposal involved

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	M	L	NONE	NONE	M	L	L	M	L	L
Hydro Mechanical	L	L	L	NONE	NONE	L	L	L	L	L	L
Instrumental SCADA, surveillance	L	L	L	NONE	NONE	L	L	L	L	L	L
Painting	L	L	L	NONE	NONE						
Road work	M	L	L	NONE	NONE	L	L	L	L	L	L
Safety measures (Siren, Lighting)	L	L	L	NONE	NONE	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

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 3rd May 2020. 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. Number of family living downstream of dam is 24. The population is about 170 nos. A formal consultations will be held and outcomes documented at opportune time.



Consultation with Villagers

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 1957. 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

Based on these findings relating to both structural and non-structural interventions, potential stakeholders were categorized as Affected stakeholders, Other interested stakeholders and disadvantaged & vulnerable stakeholders.

Affected Stakeholders: There are no affected persons who shall be directly or indirectly adversely affected by the proposed interventions.

Other interested stakeholders: In relation to structural interventions, these would be contractors, project management consultants, regulatory bodies/institutional stakeholders such as revenue, environmental Authorities, people living in downstream reaches etc. In relation to non-structural interventions, these would be communities living downstream including farmers; community leaders; district administration, police, state disaster management authority, revenue department, electronic and print media, etc. These communities would be key stakeholders requiring to be involved in the preparation and implementation of Emergency Action Plan (EAP).

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.

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 pointing of upstream open joints and crevices, curtain grouting at foundation from upstream of dam etc. pose risk of water pollution and impact on fish fauna.
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 very few Scheduled Tribes households in the district, which are mainstreamed into the overall society and do not meet the characteristics outlined in ESS7. 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

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	<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	<ul style="list-style-type: none"> • SEP in accordance 		

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
Engagement Plan	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	A	DI	WQ, PE, L, G
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	PE, L, G
8	Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)	NA		
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	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			
B	Pre-construction and			

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
	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		
	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 (PI 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	Pointing of upstream open joints and crevices	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	Curtain grouting at foundation from upstream of dam	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
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	Strengthening of dam by adding mass on downstream	PE, L, G	Air pollution, noise pollution, waste generation from surface cleaning and preparation, and Labour & GBV risk	M
b	Repair of damage to spillway bucket	WQ, PE, L, G	Air pollution, noise pollution, risk of river water contamination, construction debris, Labour and GBV risk	L
c	Construction of retaining wall to access road	PE, L, G	Air pollution, noise pollution, construction debris, muck from excavation, Labour and GBV risk	L
3.	Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)			
a	Repairs of sluice gates	PE, L,G	Air pollution, noise pollution, waste generation from removed parts and empty paint containers, Labour & GBV risk	L
b	Cable tray for power cable to hoist	PE, L, G	Air pollution, noise pollution, Labour and GBV risk	L
c	Dam Instrumentation (Geo-technical, hydro-meteorological, Seismic, Geodetic, data collection, storage, data transfer, analysis, retrieval, Operation & Maintenance etc.).	OH, PE, G	waste generation from removed parts and packing material, labour risk	L
4.	Instrumentation, General lighting and SCADA systems			

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 (PI 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	Installation of Accelerographs (3 Nos.) Installation of Inflow forecasting & early warning system		No Impacts	
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, 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: List of Participants in the Stake Holders’ Consultation for Poringalkuthu Dam on 3rd May 2020

SL. No.	Name of Participant	
1	Madhavan – Mooppan	Poringalkuthu Colony
2	Pankajakshy	-do-
3	Kunjumon	-do-
4	Sanimol	-do-
5	Sudhi	-do-
6	Paily	-do-
7	Unnikrishnan	-do-
8	Joshymon M.N	Puliyilappara
9	Nelson P	-do-
10	Sajeevan R	
11	Vysakh Mohan	Ammancheri
12	Suresh Kumar P, Assistant Executive Engineer, Poringalkuthu Dam	KSEBL
13	Rajeev M G, Sub Engineer, Poringalkuthu Dam	KSEBL