DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP) PHASE II

(Funded by World Bank)

UPPER BHAVANI PUMPING WEIR

TN12MH0033

ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT

DECEMBER 2024

Tamil Nadu Green Energy Corporation Limited (TNGECL)

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ABBREVIATIONS AND ACRONYMS

AIDS	:Acquired Immune deficiency Syndrome
CA	:Conservation Area
CCA	:Cultivable Command Area
COVID	:Coronavirus Disease
CWC	:Central Water Commission
DRIP	:Dam Rehabilitation and Improvement Project
DSRP	: Dam Safety Review Panel
E&S	: Environment & Social
EAP	: Emergency Action Plan
ESDD	: Environmental and Social Due Diligence
ESF	: Environmental and Social Framework
ESIA	: Environmental and Social Impact Assessment
ESMF	: Environmental and Social Management Framework
ESMP	: Environmental and Social Management Plan
ESS	: Environmental and Social Standard
GBV	: Gender Based Violence
GIS	: Geographic Information System
GRM	: Grievance Redressal Mechanism
HIV	: Human Immunodeficiency Virus
IA	: Implementation Agency
IPF	: Investment Project Financing
MCM	: Million Cubic Meters
OHS	: Occupational Health & Safety
PA	: Protected Area
PDO	: Project Development Objective
PMF	: Probable Maximum Flood
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
TNGECL	:Tamil Nadu Green Energy Corporation Limited
WB	: World Bank
WQ	: Water Quality

EXECUTIVE SUMMARY

This weir was constructed as Diversion Weir for Upper Bhavani Dam. This is masonry gravity weir having a height of 18.90 m and the length is 122.22 m. It has been proposed to undertake rehabilitation measures (remedial works 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 consultations with communities, living downstream/vicinity of the dam, was conducted on 10.06.2022.

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, protected area and SEAH/GBV. Environment risks of air, water, noise, land use, soil and resource use for special repairs to masonry portion of dam like u/s face treatment are Moderate. Similarly, environment and social risk of transportation of material, labour camp and disposal of debris has been identified as moderate.

Weir is located in Reserve Forest Area, biodiversity conservation will be a priority area during the execution of rehabilitation work. Due to limited amount of rehabilitation work proposed, which is within the weir area, risk on outside sensitive habitat due to rehabilitation work is not significant as all the activities will be carried out within the weir area on the land owned by TNGECL. Only risk identified on ecologically sensitive habitat in dam surrounding is due to transportation of material and involvement of outside labour for rehabilitation work.

Overall risks are low to moderate and localized, 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)
- Biodiversity Conservation Plan (ESS6)
- Stakeholders Engagement Plan (ESS10)

Overall, the proposed activities within this dam sub-project have low to moderate risks resulting in the overall sub-project to be categorized as low risk category. These risks and impacts can be effectively mitigated with effective implementation of mitigation plans by SPMU/IA, Contractors and monitoring by EMC, SPMU and CWC.

Chapter 1 INTRODUCTION

1.1 PROJECT OVERVIEW

The proposed Dam Rehabilitation and Improvement Project (DRIP II) would complement the 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 project is likely to be implemented for 300 dam 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, and 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 – UPPER BHAVANI PUMPING WEIR

The Upper Bhavani Pumping Weir which was constructed during the year 1963-1966 across river Bhavani with 18.90 m high and 122.22 m long masonry gravity structure is located 71 km away from Ooty. The Latitude of the weir is 11° 13' 12" N & Longitude is 76° 31' 26" E. The water pumped into Upper Bhavani reservoir augments water resources of the Power Houses under Kundah Hydro Electric Scheme.

The water pumped into Upper Bhavani reservoir augments water resources of the Power Houses under Kundah Hydro Electric Scheme.

Salient features of the project area are reported below:

1.	River	Bhavani River.
2.	Location of the Weir	This Weir is located at 71 km away from Ooty in Nilgiris District, Tamil Nadu.
3.	Latitude	11° 13' 12" N
4.	Longitude	76° 31' 26" E
5.	Catchment area	4.38 Km2
6.	Maximum Flood discharge	548.17 Cumecs (19350 Cusecs)
7.	Revised Maximum discharge as per Hydrology Review Study	548.17 Cumecs (19350 Cusecs)
8.	Type of Weir	Masonry Gravity
9.	Scheme work commenced during	1963
10.	Works completed during	1966
11.	Reservoir capacity	Gross capacity : 0.65 M.cum (23 Mcft) Effective capacity : 0.312 M.cum (11 Mcft)
12.	Water spread area at FRL	0.22 Km2
13.	Height of Weir	18.90 m
14.	Length of masonry Weir	122.22 m
15.	Length of Spillway	52.42 m
16.	Top level of Non-Spillway	+2209.80 m
17.	Crest level of Spillway	+2205.84 m
18.	Maximum water level	+2208.89 m
19.	FRL	+2205.84 m
20.	Minimum draw down level	+2202.18 m
21.	Deepest Bed level	+2192.12 m
22.	Deepest Foundation level	+ 2190.90 m
23.	Top width of Weir	2.28 m
24.	Spillway	1 No

25.	Spillway gate	Ungated
26.	Length of Non-spillway	69.80 m (L/F – 28.35 m ; R/F – 41.45 m)
27.	Size of construction vent pipe	1 No x 300 mm dia

Proposed Interventions/Activities and Intended Outcomes

The Dam Safety Review Panel (DSRP), constituted for the purpose of inspection of the TNGECL dams to undertake repair, rehabilitation and modernization works under World Bank aided DRIP-II & III schemes, made a visit to Upper Bhavani Pumping Weir on 17/08/2021. It 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.

REMEDIAL WORKS

1.Basic Facilities:-
Improvements to the L/F approach roads to Weir.
Water supply arrangements to the Upper Bhavani Staff Camp.

2.Remedial Works:-
Jungle Clearance.
Repair to revetment / pitching.
Colour washing, Painting and Name board.
Rim protection works.
Fencing to Weir for safety aspects.

3.Earth slip protection works:-
In the approach road to the Weir on the left flank.
Rim protection works.

4.Special repairs to masonry portion of dam:-
Reaming the vertical & drainage shafts
Water washing for removal of lime leaching and pointing.
Spillway treatment.
Approach steps to downstream side of the weir.

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

DSRP Team's Inspection of Upper Bhavani Pumping Weir.

Damaged RR Protection Wall on the Left Flank side

Upstream side masonry joints with leaching


Downstream face with calcium leaching with algae growth


Spillway with algae growth


Vertical shafts without proper cover


Damaged fencing on the left flank side

Approach steps to be provided on the left flank side to reach the Dam toe

Approach road with slush deposits

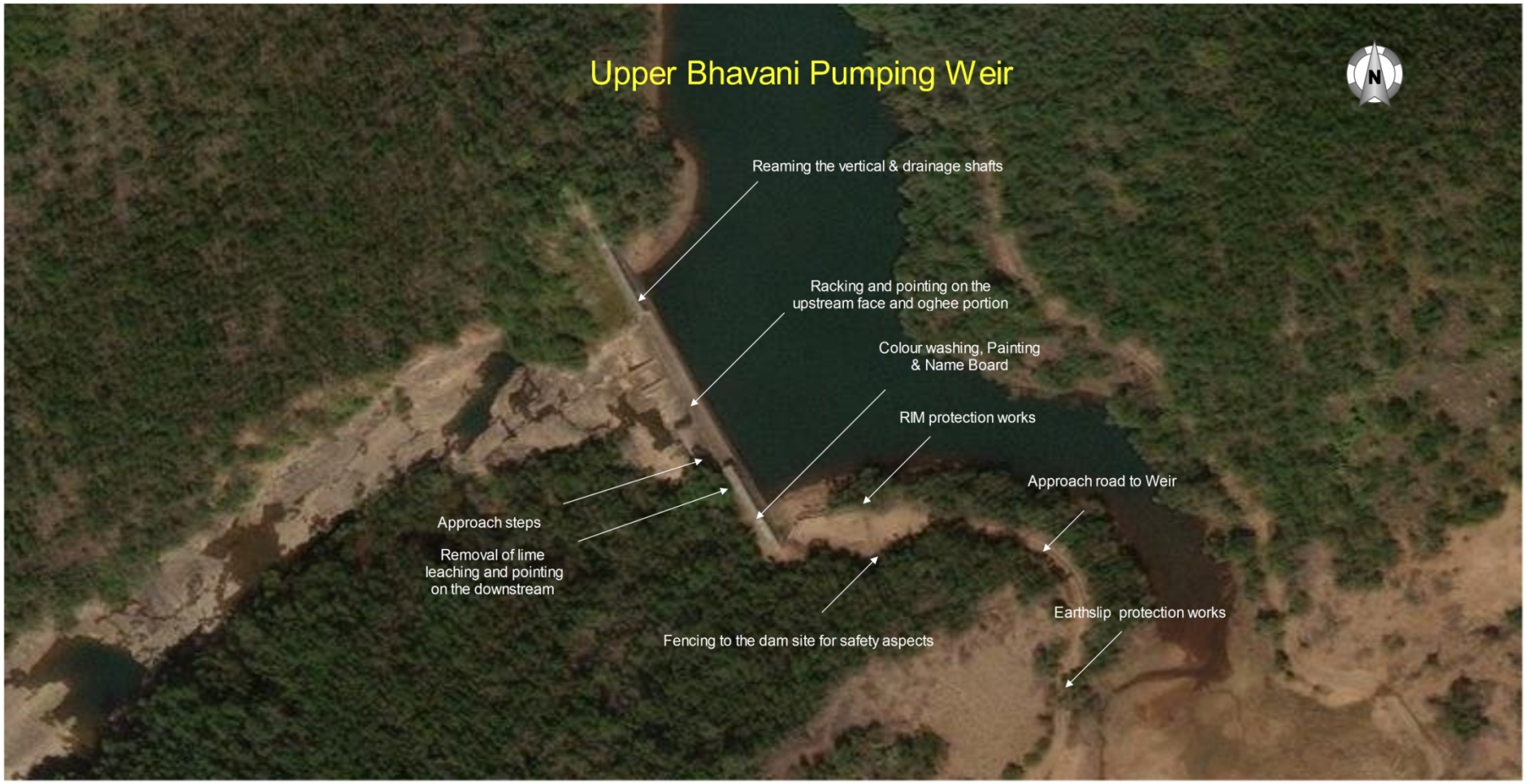
Approach road in damaged condition


Damaged BT surface and slipped earth


Scoured road side require to be protected


Rim protection works

Cavity portion filled with lean mixed concrete



Figures 1.2 Project area showing major intervention locations of Upper Bhavani Pumping Weir

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 18 months. Dam Authority 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) : 04/2025
Proposed Ending of implementation (MM/DD/YYYY) : 09/2026
Implementation Duration (months) (MM) : 18 months

b) Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Main package C M E works	04/2025	09/2026	Procurement process will be initiated after obtaining approval of the PST from World Bank.
2	Procurement– instrumentation, goods, inspection vehicles	NIL		

1.4 PURPOSE OF ESDD

The overall project (DRIP II) was categorized as Low to Moderate 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;

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.

Stakeholder consultations with communities living downstream/vicinity of the dam have been held on 10/06/2022.

Chapter 2 INSTITUTIONAL FRAMEWORK AND CAPACITY ASSESSMENT

2.1 POLICY AND LEGAL FRAMEWORK

India has well defined environmental and social regulatory framework. The regulation applicability depends on nature of work and location of work. Broadly legislation can be divided into four categories viz. environmental, forests, wildlife conservation and social. The applicability analysis of regulations pertaining to all the above four categories was carried out. The applicability of World Bank ESF comprising, 10 ESSs (ESS1 to ESS10) to the proposed rehabilitation proposals and Standard specific requirements were analyzed. Further, a comparison of national environmental and social regulations versus World Bank's ESS has been carried out along with the gap analysis. Applicability of Indian regulations, World Bank's ESS along with comparison and gap analysis is discussed in ESMF.

Central Water Commission, Ministry of Jal Shakti, Government of India has prepared "Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects" and is under publication as a guiding document for the dam owners to systematically address in advance the environmental safeguard requirements and have discussed in detail all applicable legal requirement. Reference has been drawn from this document as well, while carrying out applicability analysis.

Indian environmental 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 cultivable 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 or conservation areas (CA).

Therefore, for the proposed dam rehabilitation activities at Upper Bhavani Pumping weir, regulatory clearances will be applicable as per Indian regulation, such as permission from Forest department is required for transport of men and material inside protected area. Another applicable regulatory requirement is discussed in ESMF.

2.2 DESCRIPTION OF INSTITUTIONAL FRAMEWORK

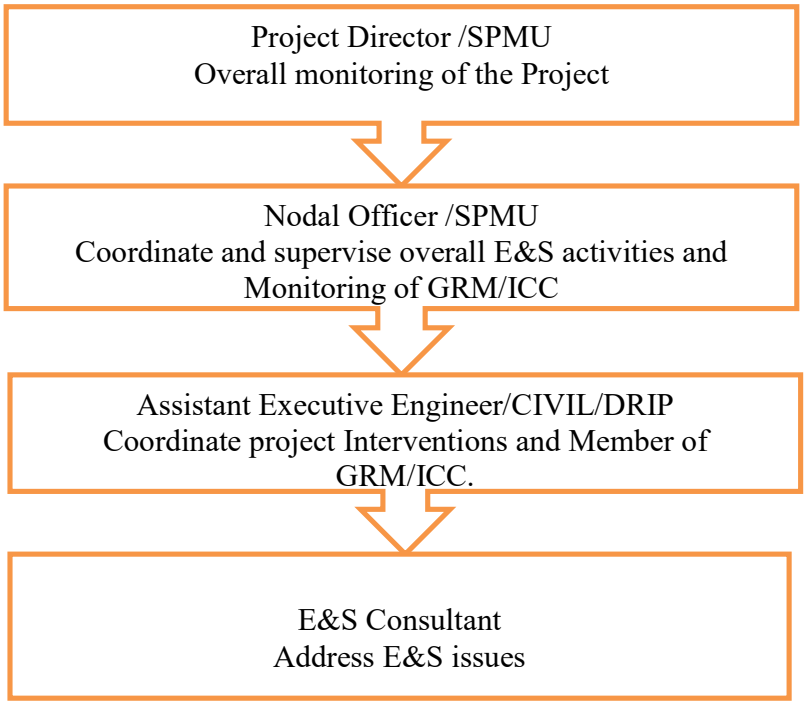
The sub-project will be implemented by Tamil Nadu Green Energy Corporation, Government of Tamil Nadu. TNGECL being responsible for power generation, transmission and distribution; have a well-established customer complaint system for power consumer; where they can register their

complaints 24x7 on dedicated line (1912). It also has a 24x7 Chairman's complaint cell with phone number and whatsapp numbers. In addition, it has established a Consumer Grievance Redressal Forum, where consumers can register complaints online/manually, directly or through a representative to be resolved within a period of 60 days; with a provision of filing appeal in next 30 days if the complainant is not satisfied with the redressal.

Tamil Nadu Green Energy Corporation Limited do not have in-house expertise to address E&S issues. As per the suggestions of CPMU/CWC, it is proposed to outsource consultancy services of Environmental and Social experts to assist TNGECL in resolving E& S issues.

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, Grievance Redressal Mechanism has been established with two nodal officers, one at SPMU level and another at Field level. Sexual Harassment complaints can be made to either at dam level or SPMU level. As committed in ESCP, a Grievance Redress Mechanism (GRM) will be established and operated by the contracted agencies to address Project workers workplace concerns. SPMU will have oversight responsibility on the functioning of the GRM.



Chapter 3 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

Assessment of physical, ecological and socio-economic conditions at dam site and immediate surrounding has been carried out based on secondary information and site observations; as discussed below.

3.1 PHYSICAL ENVIRONMENT

Land Use/Land Cover

The project surrounding area land use and environmental sensitivity was analysed using GIS techniques. Land use/ Land cover map within 5 km radius of Weir is presented at **Figure 3.1**. As can be seen from the map, evergreen/semi-evergreen forest, deciduous forest, and agriculture/fallow land dominates the land use in project surrounding area. In addition, there are small patches of scrub forest and crop land; small and scattered settlement and water body (reservoir). However, the project activities will be confined to Weir body only and no structural interventions are proposed beyond existing Weir boundaries. Two major villages are identified in Weir surrounding (within 5 km) viz. Upper Bhavani and Korakundah.

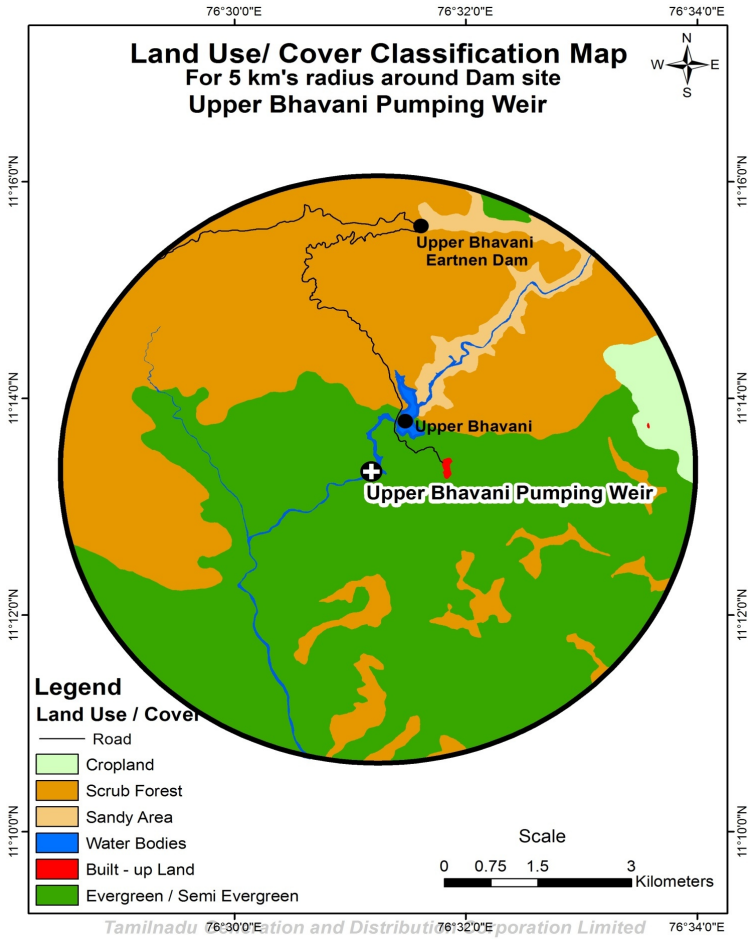


Figure 3.1: Land Use and Land Cover Map of 5 km radius around Upper Bhavani Pumping Weir site

Natural Hazards

Potential of natural hazards such as flooding and earthquake has been assessed.

In terms of Indian Standard IS 11223-1985 criteria, Upper Bhavani Pumping Weir is classified as a 'Intermediate Dam' and, accordingly, qualifies for PMF (Probable Maximum Flood) as the design flood. As the design flood discharge for the Upper Bhavani Pumping Weir is 548.17 m3/sec is more than the derived peak inflow flood of 518.26m3/sec, no flood routing study is required and there is no necessity for providing any additional surplus arrangement for the Upper Bhavani Pumping Weir.

Project location falls on the boundary between earthquake zone II & III, and same was considered at the time of design and there is no need for seismic design review. The 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

Upper Bhavani Pumping weir is located in the TNGECL's own land and was constructed during the period 1963-66. The area falls under the "Reserve Forest". Due to its location, within the protected area, permission is required from Forest Department to transport construction materials, manpower and equipment to dam site. Rehabilitation works, including resurfacing of existing roads, after obtaining permissions from Principal Chief Conservator of Forest. Permissions will be obtained by Officer of Forest Department after award of work and before commencement of works to transport construction materials, manpower and equipment to dam sites.

Location of the dam with respect to Mukurthi National park and Mudumalai Tiger reserve is given at Figure 3.2.

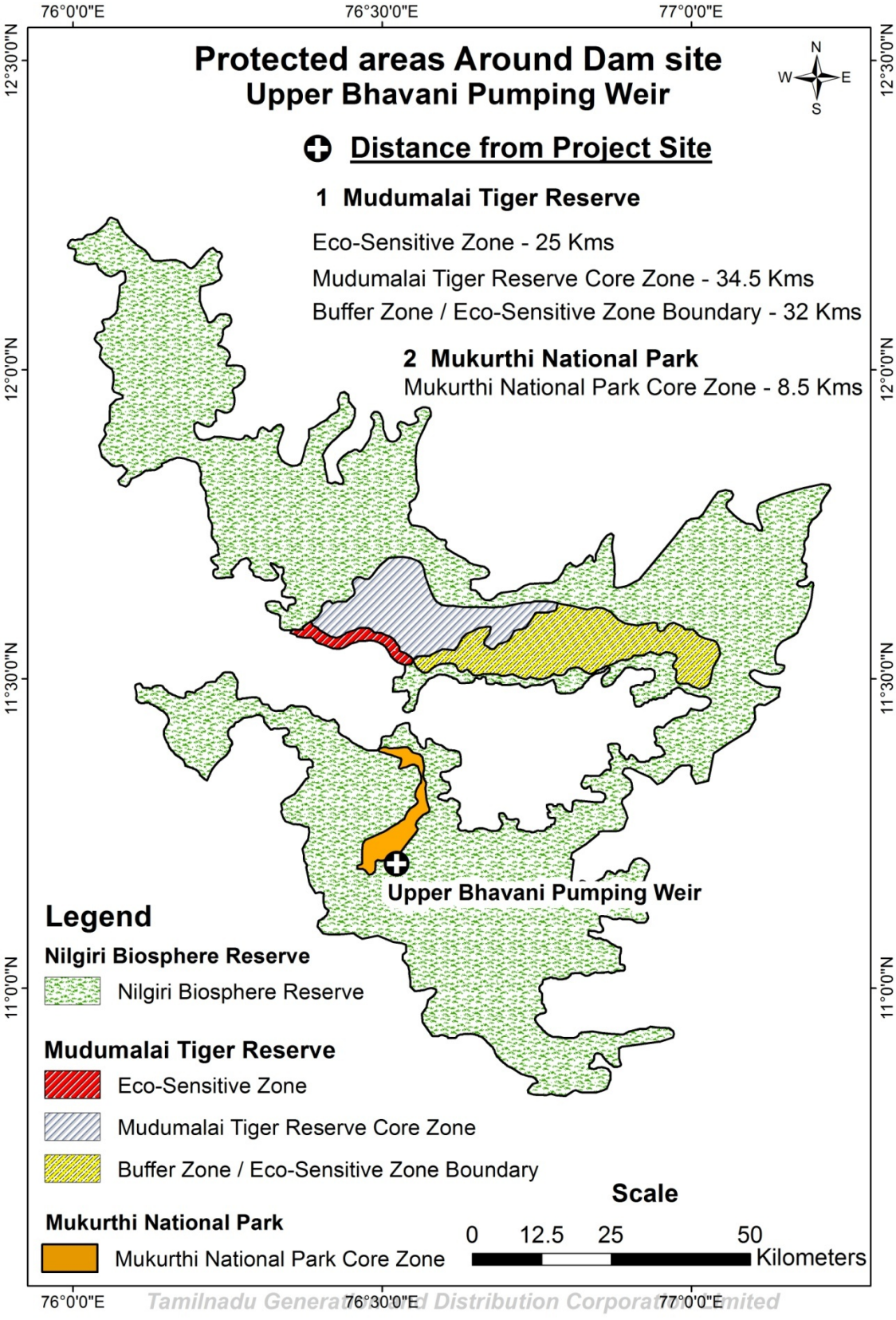


Figure 3.2: Protected Areas around Dam Site

3.3 SOCIAL ENVIRONMENT

Upper Bhavani Pumping Weir is located in Nilgiris District in Tamil Nadu. There is no significant settlement in the proximity areas of the project. There are no Schedule V1 areas in Tamil Nadu.
The district is divided into three revenue Divisions namely Ooty, Coonoor and Gudalur. The district has six tehsils (talukas) namely Coonoor, Kotagiri, Udhagamandalam, Kundah, Gudalur and Panthalur along with 4 Panchayat Unions (Community Development Blocks); Gudalur, Udhagamandalam, Kotagiri and Coonoor.

The economy of the district is primarily dependent on non-agriculture sector. The brief demographic characteristic of the district is given in the table below:

No. of Households	**1,97,653**	**Household Size**	**04**
Total Population	**7,35,394**	**Population (0-6 age)**	**6 6,799**
Male	3,60,143	Boys (0-6 age)	3 3,648
Female	3,75,251	Girls (0-6 age)	3 3,151
Sex Ratio	1042	Sex Ratio (0-6)	985
Population (SC)	**2,35,878 (32.08 %)**	**Population (ST)**	**32,813 (4.46%)**
Male	1,15,917	Male	16,091
Female	1,19,961	Female	16,722
Literates	**5,69,647**	**Literacy Rate (in %)**	**85.20**
Male	2,99,447	Male	91.72
Female	2,70,200	Female	78.98
No. of Workers	**3,49,974**	**Cultivators**	15,645 (4.47%)
Male	2,12,172	**Agricultural Labours**	79,100 (22.60%)
Female	1,37,802	**Household Industrial Workers**	3,895 (1.11%)
No. of Main Workers	**3,18,924**	**Other Workers**	2,51,334 (71.82%)
No. of Marginal Workers	**31,050**		
			Source: *Census of India, 2011 (District Handbook)*

Schedule tribe population in the district is very limited (4.46%) and are scattered. There are only very few Scheduled Tribe households in the downstream areas and they are mainstreamed in the area with other households. No physical interventions planned in the downstream areas. Therefore, ESS7 is not applicable. Downstream areas including ST households will be taken into account during the preparation of Emergency Action Plan for Upper Bhavani Pumping Weir.

3.4 CULTURAL ENVIRONMENT

List of National Monuments in Tamil Nadu and list of State Protected monuments in Tamil Nadu have been reviewed. There are protected monuments identified by Archaeological Survey of India however none of them are in the vicinity of the project.

Chapter 4 ACTIVITY WISE ENVIRONMENT & SOCIAL SCREENING, RISK AND IMPACTS IDENTIFICATION

4.1 SUB-PROJECT SCREENING

The sub project 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 chemicals, construction material, and debris leading to water pollution and impacts on fishes.

As the dam is located within Wildlife Sanctuary and bordering a tiger reserve, biodiversity conservation is a priority area during the execution of rehabilitation work. Due to limited amount of rehabilitation work proposed, which is within the dam area, risk on outside sensitive habitat

due to rehabilitation work is not significant. Proposed rehabilitation work includes repair to masonry portion of dam and shutters, electrification/lighting, repair to approach road and construction of guard room. These activities will be carried out within the dam area on the land owned by TNGECL. Only risk identified on ecologically sensitive habitat in dam surrounding is due to transportation of material and involvement of outside labour for rehabilitation work.

Pre-construction and construction stage major auxiliary or preparatory intervention are within 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 also be within the dam area due to protected habitat in dam surrounding. 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. They also pose risk to protected habitat in dam surrounding.

Project will involve project managers and supervisors, contracted workers – these would also include migrant workers as the required labour will not be available locally for a number of reasons, such as worker's unavailability and lack of technical skills and capacity, there is no significant human habitation in immediate surroundings of dam. Construction contractors will stay within dam area, 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 within the dam premises; hence risk of SEA/SH is unlikely.

Non-structural interventions such Emergency Action Plan has not been proposed, however, EAP shall be prepared and implemented. Upper Bhavani Pumping Weir drains into downstream Pillur Dam and there is no significant habitation in the downstream stretch up to Pillur reservoir. Vulnerable population in the downstream area, if any, will be appropriately contacted during implementation of EAP.

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 categorized 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 following activities as having Moderate Risks/impacts.

- Special repairs to masonry portion of dam: u/s face treatment
- Labour Camps involved
- Major Debris Disposal
- Transportation of material
- Repair and maintenance works to quarters

All other activities are categorized as low risk activities. 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)	M	M	L	None	None	L	L	L	M	L	L
Hydro Mechanical	None	None	None	None	None	None	None	None	None	None	None
Instrumentation, surveillance	None	None	None	None	None	None	None	None	None	None	None
Painting	L	L	L	M	None	L	L	L	M	None	L
Road work	M	L	L	None	None	L	L	L	M	L	L
Safety measures (Siren, Lighting)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Civil Work like Additional Spill Way	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Hydraulic Structure (tunneling)	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 STAKEHOLDER CONSULTATION

Stakeholder consultation was made at Upper Bhavani Pumping Weir on 10/06/2022. Inputs were taken from permanent staff of the borrower (TANGEDCO) working at Weir.

Stakeholder consultation was made 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, etc.

e. Identify mechanisms that would be deployed to engage with different stakeholders and particularly communities living downstream.

Following is the outcome of the stakeholder consultation exercise. List of participants is enclosed as **Annexure III**.

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 stakeholder's consultation meetings planned for dissemination of emergency action plans which is a non-structural measure.	The proposed structural Rehabilitation activities are within the Weir premises only. This Weir is located in the Reserved Forest area and there is no possibility of community interference during the implementation of Rehabilitation work including stakeholder's consultation meeting.
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.	The Weir is located in the Reserve forest area; there were no displacement and resettlement issues during construction.
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.	No encroachers (or) squatters within the Weir premises so far.
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?	Dealing of Environmental and social activity by CWC environmental experts.
5. Who will be in charge of E&S related activities at dam site and at SPMU level?	Dam site : Executive Engineer/ Civil/ DRIP/ Madurai SPMU : Executive Engineer/ Civil/ DRIP/ Chennai
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?	Through mobile.
7. What is existing mechanism to communicate with downstream communities/public on unregulated releases of water during high flood time	1. Written Communication to the District Collector. 2. Advance intimation to the public/ downstream communities through

siren/written communication to district authorities/ telephone/mobile/text messages or any other mode of communication?	mobile.
8. How do you ensure that downstream community is fully aware of the above existing mechanism?	Does not arise.
9. Are there women employees at the dam site?	-Nil-
10. Is there any existing Grievance Redressal Mechanism (GRM) within the department to address any kind of grievance/complaints by general public?	Yes. Executive Engineer/Civil/DRIP-I/Chennai @ HQrs. Executive Engineer/Civil/DRIP/Madurai @ Field.
11. Details of any grievances received lately related to this new Scheme?	-Nil-
12. Is dam premise a restricted area or has open access to general public?	Access to Weir area – Fully restricted.
13. Are there tribal's living in the surrounding area of dam complex? Which tribes are these? Please give brief detail.	There is no tribal's living in the surrounding area.
14. Does the dam have any tourism/water recreation facilities? If yes, how many approximate tourist visits annually, annual revenue generated, whether any portion of this generated revenue is diverted to regular O&M of this dam.	-Nil-
15. Do you engage any local labours 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?	Routine Weir maintenance works are being done by department staff and through Government approved contractor.

B. Interaction with Local Community

Questions	Responses provided / Observations
1. How many villages are in immediate downstream vicinity?	The weir is in Reserved Forest Area. There is no village in immediate downstream 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 Upper Bhavani Pumping Weir. Is there any pending compensation issues?	Weir area is fully covered in Reserved forest area. Displacement and Rehabilitation does not arise.
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.	-NO-
7. Are you aware of local women affected in any way by dam operations?	-NO-
8. Are you aware of any early flood warning system for this dam, or any other system wherein downstream communities getting regular update during flood season for any uncontrolled release of water?	No. The weir is having ungated spillway.
9. Are you aware of any dam related incident happened in the past wherein some loss of life encountered? If yes, brief summary may be given	-NO-
10. If you have to contact the dam authorities; how will you contact, through telephone/ mobile/ e mail/ personally?	By Mobile and in Person.
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?	Such situation did not arise.
12. Give your views about Upper Bhavani Pumping Weir, how this dam is helping Country, State, district or local communities in meeting its objectives, any specific concern can also be given?	The water pumped into Upper Bhavani reservoir augments water resources of the Power Houses under Kundah Hydro Electric Scheme.

13. (a) Are you aware of any document named Emergency Action Plan (EAP) of the dam?	-NO-
(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?	Consultation meeting to be conducted.
(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?	YES
(d) If yes, how to contact you, please give the corresponding address alongwith all details to receive the official communication.	1. Thiru. D.Vijay Anand, Assistant Engineer/ Mechanical, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219. Ph No: 7598409800. 2. Thiru. K.Anathakrishnan, Mechanical II Grade, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219. Ph No: 94427 99903. 3. Thiru.N.Andiyappan, Wireman / Electrical section, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219. Ph No: 9488693520. 4. Thiru. S.Murugan, Electrician I Grade. Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219. Ph No: 9488378931. 5. Thiru.P.Meganathan, Mechanical III Grade, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219. Ph No: 8903085741.

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-
15. Any suggestion to improve overall system by dam authorities in any way, please give in brief?	Proposed Dam Rehabilitation and Improvement works, as per DSRP recommendations, shall be carried out as a safety measure.

Following is the summary of the outcome of stakeholder consultation:

1. All the participants welcomed the proposed interventions relating to dam safety and ensured that our DRIP work will not affect the villages during execution.
2. The participants explicitly mentioned that the dam is their lifeline and strengthening works will help their long term livelihood and therefore welcomed such information.
3. Participants have expressed that they do not have any grievances and as such no grievances were ever reported from their communities/ neighbor hoods.
4. There are no pending issues regarding dam construction related resettlement.
5. The participants are working in TNGECL.
6. The participants stated that, to engage daily wage labourers during execution of the DRIP works.

Communities welcomed such interactions and indicated that they would prefer Weir authorities conduct such face-to-face meeting, 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, local media, etc, but preferred to have face to face interactions.

Based on these findings relating to both structural and non-structural interventions, potential stakeholders were categorized as Affected stakeholders, other interested stakeholders and Disadvantaged and 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, etc. In relation to non-structural interventions, these would be communities living downstream including farmers; village heads, 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).

Disadvantaged and vulnerable persons and groups: Illiterate persons, physically challenged, women and elderly would be key stakeholders – requiring special focus and outreach to ensure that they are well informed about the provisions of the EAP.

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 summarized below:

Environmental Impacts and Risks

1. Dam is located within the protected area, although no activity is proposed outside the dam area which is owned by TNGECL, moderate risk is identified on protected habitat due to labour movement and movement of material through protected area.

2. Environment risks and impacts, as assessed above, for various project activities under this sub-project are categorized as Low and Moderate due to localized nature of proposed activities i.e. activities remain limited to dam area except for labour camp and muck/debris disposal.

3. Execution of civil work within weir body will generate localized impacts on physical environment and resource use; pose risk of exposure of workers requiring personal protective equipment (PPE) use.

4. Civil work interfaced with water body pose risk of water pollution and impact on fish fauna.

5. Construction waste and muck from repairs to masonry portion of dam like u/s face treatment, approach road etc require careful disposal at pre-identified and approved site to minimise the risk of pollution on this count.

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. The dam is not located in the Schedule V area. 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 little 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 ate 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/ work force in situations of natural calamities.
- Health risks of labour relating to HIV/AIDS and other sexually transmitted diseases
- Non-payment of wages
- Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
- Unclear terms and conditions of employment
- Discrimination and denial of equal opportunity in hiring and promotions/ incentives/ training opportunities
- Denial for workers' rights to form worker's organizations, etc.
- Absence of a grievance mechanism for labour to seek redressal of their grievances/ issues.

Chapter 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 Risk Classification

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Physical Environment, labour, protected area and SEAH/GBV. The summarised environmental and social risk of identified activities, with level of risk, is presented in previous chapter. Environment risks of air, water, noise, land use, soil and resource use for special repairs to masonry portion of dam like u/s face treatment are Moderate. Similarly, environment and social risk of transportation of material, labour camp and disposal of debris has been identified as moderate due to location of dam within the protected area. 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 generic 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 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, 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 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	Dam is located within the Anaimalai Tiger Reserve. As no interventions are planed outside the dam, no direct impacts have been identified

	on natural
Relevant ESS	**Reasons for Applicability of the standard**
	To eliminate risks of indirect impacts due to outside labour and transportation of man and material, Biodiversity Plan will be prepared.
ESS 10: Stakeholder Engagement Plan	For engagement of stakeholders in all structural and non-structural 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)
- Bio-diversity Conservation Plan (ESS6)
- Stakeholders Engagement Plan (ESS10)

c. Contractor shall submit BOQ as per ESMP of the sub project.

Mitigation plans to meet requirements for relevant Standards with responsibility and stages are given in **Table 5.2** below:

Table 5.2: List of Mitigation Plans with responsibility and timelines

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	Gender Based Violence or SEA/SH related actions	SPMU/IA	Before mobilization of contractor
ESS2: Labour and Working Conditions	Labour Management Procedure (LMP) including	SPMU/IA	Before mobilization of contractor

	OHS management plan.		
WB-ESS Triggered	**Mitigation Instrument**	**Responsibility**	**Timelines**
ESS3: Resource Efficiency, Pollution Prevention and Management	Pollution Prevention and Environment Quality Management Plan (PPEQMP)	SPMU/IA	Before mobilization of contractor
ESS 4: Community Health and Safety	Community Health and Safety Management Plan (CHSMP)	SPMU/IA	Before mobilization of contractor
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	Biodiversity Conservation Plan	SPMU/IA	Before mobilization of contractor
ESS 10: Stakeholder Engagement Plan	Stakeholder Engagement Plan	SPMU/IA	By negotiation

ESDD and ESMP will be placed on the www.damsafety.in website as well as other accessible locations such as the office of Engineer in Charge at Dam site as well at SPMU for reference and record. These documents would be disclosed/disseminated through other appropriate means like project meetings, workshops etc. Each IA will translate these documents in their local language, if required, and will upload in their respective websites and also make available at other accessible locations.

5.2.2 Institutional Management, Monitoring and Reporting

ESMP will be customized 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), Occupational Health (OH), Physical Environment (PE), Cultural (C), Tribal presence (T), impact on private land/assets/encroachers/squatters (LA), Labour (L), GBV risks (G), (Write whichever is applicable)
1	2	3	4	5
A	**Nature of Project Component Related**			
1	Reservoir Desilting	**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 Repairs to revetment/rip-rap in u/s face)	**A**	**DI**	**WQ, F, OH, PE, L, G**
5	Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir) (like energy dissipating arrangement etc.)	**A**	**DI**	**WQ, OH, PE, L, G**
6	Remodelling earth dams to safe, stable cross sections	**NA**		
7	Hydro-mechanical/electrical activities with interface with dam reservoir	**NA**		
8	Hydro-mechanical/ electrical activities Downstream of Dam site (with no interfacing with dam reservoir)	**NA**		
9	Instrumentation, General lighting and SCADA systems	**A**	**DI**	**OH, L**
10	Basic Facilities (like access road improvement, renovation of office, etc)	**A**	**DI**	**OH, PE, L, G**
11	Utility installation like standby generator, or setting up solar power systems	**NA**		
12	Painting Work	**A**	**DI**	**WQ, OH, L**
13	Water recreation activities	**NA**		
14	Tourism Development	**NA**		
15	Solar power/floating solar	**NA**		
16	List any other component not listed above			
i	Jungle clearance	**A**	**DI**	**E, L, G**

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated within dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries(F), Conservation area(CA), Protected Area (PA), Ecological (E), Occupational Health (OH), Physical Environment (PE), Cultural (C), Tribal presence (T), impact on private land/assets/encroachers/squatters (LA), Labour (L), GBV risks (G), (Write whichever is applicable)
1	2	3	4	5
B	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Acquisition of forest land involved	**NA**		
2	Taking of private land (including physical or economic displacement, impact on livelihood; temporary loss of business)	**NA**		
3	Major Borrow materials requirement involved	**NA**		
4	Major Quarry materials requirement involved	**NA**		
5	Blasting involved	**NA**		
6	Resettlement and Rehabilitation	**NA**		
7	Types of project workers (Direct, Contracted, Community Workers (or Volunteers i.e. for EAP implementation)	**A**	**DE**	**L, G**
8	Labour Camp involved (location within dam premises or outside)	**A**	**DE**	**WQ, PE, L, G**
9	Migrant labour likely to be involved	**A**	**DE**	**L, G**
10	Heavy machinery to be deployed and related maintenance workshop set up involved	**A**	**DI**	**OH, PE, L, G**
11	Hot mix plant Requirement	**NA**		
12	Concrete mixture and heavy pumps to be deployed	**A**	**DI**	**OH, PE, L, G**
13	Temporary land acquisition involved	**NA**		
14	Temporary disruption to access, livelihoods	**NA**		
15	Tree felling/ vegetation clearance involved	**NA**		
16	Haulage of machinery involved	**A**	**DI**	**OH, PE, L, G**
17	Major Debris Disposal involved	**A**	**DE**	**PE, L, G**
18	Major Transport of materials involved	**A**	**DE**	**PE, L, G**
19	Utility shifting involved	**NA**		
20	Discharge of reservoir water (lowering of reservoir water involved)	**NA**		
21	**List any other not listed above**			

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

Annexure – II: Form SF2

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
A	**Project Component Related**			
1.	**Structural Strengthening/Improvement/Repair work - upstream of Dam site**			
a	Repairs to revetment/rip-rap in u/s face	**WQ, F, OH, PE, L, G**	Air pollution, noise pollution, risk of reservoir water contamination and impact on fishes, generation of construction debris, Occupational health and safety risk due to working on upstream face of dam, labour and GBV risk	**L**
b	Special repairs to masonry portion of dam • Reaming the vertical and drainage shaft • Approach Steps • Colour washing	**WQ, OH, PE, L, G**	Air pollution, noise pollution, water pollution, Occupational health and safety risk, labour and GBV risk	**L**
	Jungle clearance	**E, L, G**	Impact on ecology, 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	Energy dissipation arrangement	-	-	-
b	Colour washing, Painting & chipping, Water washing and Pointing	**WQ, PE, L, G**	water pollution, hazardous waste, Labour and GBV risk	**L**
c	Special repairs to	**OH, PE, L,**	Air pollution,	**M**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
	• Approach road to Weir	**G**	noise pollution, construction debris, Occupational health and safety risk	
d	Special repairs/constructions/improvements to buildings including electrification and fencing	-	-	-
e	Painting gates	-	-	-
3.	**Hydro-mechanical/Electrical activities Downstream of Dam site (with no interfacing with dam reservoir)**			
a	Supply and erection of entrance gate, Name Board and Gauge plate	**PE, L, G**	waste generation from removed parts, Labour& GBV risk	**L**
	Repairs to shutters • Repairs/replacement of shutters with seals	-	-	-
4.	**Instrumentation, General lighting and SCADA systems**			
a	Providing electrification to dams • lights on the top of the dam, gallery, approach road • Dam Electrification	-	-	-
B.	**Pre-construction and construction stage major auxiliary or preparatory intervention**			
1	Types of project workers (Direct, Contracted, Community Workers (or Volunteers i.e. for EAP implementation)	**L, G**	GBV risk due to involvement of workers and local population	**L**
2	Labour Camp involved (location within dam premises or outside)	**WQ, PE, L, G**	Wastewater generation from domestic activities, waste generation, GBV risk within labour and involving community.	**L**
3	Migrant labour likely to be involved	**L, G**	Migrant labour having low degree of	**L**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
			interface with community	
4	Likely interface of Workers with communities	**L, G**	Risk of GBV due to labour interaction with community	**L**
5	Heavy machinery to be deployed and related maintenance workshop set up involved	**OH, PE, L, G**	Heavy machinery will be deployed for structural measures - OH risk due to machine handling, waste, wastewater and air emissions from machines operations, Labour & GBV risk	**L**
6	Concrete mixture and heavy pumps to be deployed	**OH, PE, L, G**	Concrete mixture and pumps will be deployed for road repair and other civil works and de-watering - OH risk due to machine handling, waste generation, wastewater and air emissions from operations, Labour &GBV risk	**L**
7	Haulage of machinery involved	**OH, PE, L, G**	Machines will be hauled from different location and brought to site; OHS risk during loading/unloading and air and noise pollution during transportation, labour and GBV risk	**L**
8	Debris/Silt Disposal involved	**OH, PE, L, G**	Debris will be generated from	**L**

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work related Sub activity (s per SC-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
			various activities - OH risk during debris handling, air and noise emissions from debris handling and transportation, water pollution risk due to debris finding its way to water body, and GBV risk due to labour involvement	
9	Major Transport of materials involved	**OH, PE, L, G**	Material will be transported from various vendors and suppliers to site for civil, hydro-mechanical work and instrumentation - OH risk during material handling, loading and unloading; ,air and noise emissions from transportation, Labour and GBV risk	**L**

Criteria for Risk Evaluation:
Low: Localized, temporary and Negligible.

Moderate: Temporary, or short term and reversible under control.

Substantial: Medium term, covering larger impact zone, partially reversible.

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

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

Annexure III: Stakeholder's consultation: List of Participants

Sl. No.	Name	Relation with Dam – Staff, contractor, worker, full time/part time, local, NGO….	Mobile Number	Address (at least village name)
1.	P. Vadivelu	Assistant Executive Engineer/ Civil/DRIP/Kundah.	9445360733	Kundah Upper Camp
2.	D.Vijay Anand,	Assistant Engineer/ Mechanical, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219.	7598409800	Kundah Lower Camp.
3.	K.Anathakrishnan	Mechanical II Grade, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219.	9442799903	Kundah Lower Camp.
4.	N.Andiyappan	Wireman / Electrical section, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219.	9488693520	Kundah Lower Camp.
5.	S.Murugan	Electrician I Grade. Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219.	9488378931	Kundah Lower Camp.
6.	P.Meganathan	Mechanical III Grade, Power House-1, Generation Circle/ Kundah, Kundah Bridge Post, The Nilgiris – 643 219.	8903085741	Kundah Lower Camp.