

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

**SINGDA DAM**

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**



**February 2020**  
**(Draft Report)**

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## ABBREVIATIONS AND ACRONYMS

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AIDS	:	Acquired Immunodeficiency Syndrome
ASI	:	Archaeological Survey of India
AWS	:	Automatic Weather Station
BOCWW	:	Building and Other Construction Workers Welfare
CCA	:	Culturable Command Area
CPCB	:	Central Pollution Control Board
CRZ	:	Coastal Regulation Zone
CWC	:	Central Water Commission
DEIAA	:	District Environment Impact Assessment Authority
DRIP	:	Dam Rehabilitation and Improvement Project
EAP	:	Emergency Action Plan
ERP	:	Emergency Response Procedure
ESCP	:	Environmental and Social Commitment Plan
ESF	:	Environmental and Social Framework
ESIA	:	Environmental and Social Impact Assessment
ESS	:	Environmental and Social Framework
FI	:	Financial Intermediaries
FSI	:	Forest Survey of India
GBV	:	Gender Based Violence
GCA	:	Gross Command Area
GIS	:	Geographic Information System
GRM	:	Grievance Redressal Mechanism
HIV	:	Human Immunodeficiency Virus
IPF	:	Investment Project Financing
IS	:	Indian Standards
JTU	:	Jackson Turbidity Unit
LMP	:	Labour Management Procedure
MCM	:	Million Cubic Meters
MDDL	:	Minimum Draw Down Level
MOEF&CC	:	Ministry of Environment, Forest & Climate Change
MPCB	:	Manipur Pollution Control Board
MSDS	:	Material Safety Data Sheets
MSIHC	:	Manufacture Storage & Imports of Hazardous Chemicals
MWL	:	Maximum Water Level
NAAQS	:	National Ambient Air Quality Standards
NH	:	National Highway
NTU	:	Nephelometric Turbidity Unit
O&M	:	Operation & Maintenance
OBC	:	Other Backward Class
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PESO	:	Petroleum and Explosives Safety Organization
PMU	:	Project Management Unit
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
PUC	:	Pollution Under Control
PWD	:	Public Works Department
RCC	:	Reinforced Cement Concrete
SC	:	Scheduled Castes

SCADA	:	Supervisory Control and Data Acquisition
SEF	:	Stakeholder Engagement Framework
SH	:	State Highway
SHG	:	Self-Help Group
SPCB	:	State Pollution Control Board
SPMU	:	State Project Management Unit
ST	:	Scheduled Tribes
TMC	:	Thousand Million Cubic Feet
WLS	:	Wildlife Sanctuary
WRD	:	Water Resources Department

## 1.1 PROJECT OVERVIEW

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The proposed Dam Rehabilitation and Improvement Project (DRIP-2) would complement the suite of ongoing and pipeline operations supporting India's dam safety program. The project would continue to finance structural improvements but would break with the prevailing build-neglect-rebuild approach by giving greater emphasis to establishing sustainable mechanisms for financing regular O&M and dam rehabilitation, enhancing State capabilities to manage these critical assets through institutional strengthening, and introducing risk-informed dam safety management. The project development objective (PDO) is to increase the safety of selected dams and to strengthen institutional capacity for dam safety in participating States. Project Components include:

**Component 1: Institutional Strengthening (US\$ 40 million):** This component supports further strengthening of dam safety management in the country through institutional modernization. A major focus of activities under this component will be increasing the oversight of dam safety by developing dam safety guidelines and by strengthening the capacity of various dam safety actors to carry out the regulatory functions defined in the proposed Dam Safety Bill, which has been passed by the Lok Sabha.

**Component 2: Risk-informed Asset Management and Sustainable Financing (US\$ 25 million):** This component supports identifying long-term funding needs for dam safety based on asset management and risk assessment financing for dam safety. This component would focus on: (i) improving the efficiency of public financing; (ii) generating alternative revenue streams. Alternative revenue streams that could be developed include tourism and water recreational activities, fisheries, and other innovative schemes such as floating solar panels; and (iii) establishing financing arrangements for dam safety (e.g., dedicated budget lines).

**Component 3: Rehabilitation of Dams and Appurtenant Structures (US\$ 200 million):** This component supports improving the safety of dams through structural and non-structural interventions. Structural measures could include measures for seepage reduction (e.g., grouting, geomembranes), hydrological and structural safety measures (e.g., additional spillways, fuse plugs), enhancing the reliability of operational facilities (e.g., gates), rehabilitating foundation deficiencies, strengthening dam concrete/embankment structures, and improving basic dam facilities (e.g., access roads). Non-structural measures could include standardized dam safety instrumentation, monitoring, assessment and reporting protocols for dam health; flood forecasting and early warning systems; integrated reservoir operations including streamflow forecasting for climate resilient dam management; preparation and implementation of EAPs; preparation and implementation of sediment management plans; and revised operational rule curves to account for climate change.

**Component 4: Project Management (US\$ 15 million):** This component will ensure effective

implementation of project activities and monitoring and evaluating project implementation progress, outputs and outcomes. The component will support: (i) establishment of the Central Project Management Unit (CPMU), which will oversee and coordinate activities of the implementing agencies of the project, supported by a Engineering and Management Consultant (EMC), which is currently being procured; (ii) establishment and operations of State level Project Management Units (SPMUs) within State implementing agencies, which can hire experts in various fields as and when needed on a contractual basis; (iii) setting up of a monitoring and evaluation system; and (iv) establishment of a Quality Assurance and Quality Control system. This component will also finance consultancies, as well as related material, office equipment and incremental operating costs. The project will provide investment and technical support for the establishment of a Management Information System and Information and Communication Technology systems.

## 1.2 SUB-PROJECT DESCRIPTION – SINGDA DAM

The construction of Singda Dam Project across Singda river was completed in the year 1995. The dam is located in Singda village of Kangpokpi district of Manipur to provide the Irrigation, hydropower and domestic water supply. The dam supplies Irrigation water to 5666 ha Gross Command Area (2428 ha CCA), 0.75 MW hydropower installed capacity and 6.64 MCM annual water supply. Salient features of the project area as reported below:

<b>Project</b>	Singda Dam Project
River	Singda River
Lat/Long	24 <sup>0</sup> 52' 30"/ 93 <sup>0</sup> 48' 24"
GCA	5666 ha
CCA	2428 ha
Catchment Area	25.3 sq km
<b>Main Dam</b>	
Type	Earthen Dam
Length	490 m
Top elevation	914.50 m
Height of dam above lowest river bed level	60 m
Lowest river bed level	854.50 m
<b>Spillway</b>	
Type	Chute spillway
Length	136 m
Location of spillway	Left flank
Crest level	909.50 m
Number of bays	1
Discharge capacity at MWL	363 cumec
Revised flood	395 cumec
<b>Reservoir</b>	
Maximum water level	912.10 m
Full Reservoir Level	909.50 m
MDDL	878.00 m
Live storage	8.51 MCM
Gross storage	9.72 MCM
Reservoir spread area	51 ha
Seismic zone	V
Year of start of construction	10/1/1975

Date of completion	12/05/1995
Year of first impoundment	June 1996



**View of Dam and Submergence**

### **Proposed Interventions/ Activities at Singda Dam**

The following rehabilitation proposals have been formulated and same are described in PST. Present ESIA report has been prepared for these proposals/interventions:

#### **Structural Rehabilitation Works**

##### **Civil Work including Paint**

1. Restoration of Rip-Rap at upstream slope of Singda Dam
2. Construction of parapet wall at Singda Dam
3. Restoration of boulder apron at plunging pool outlet at Singda Dam
4. Restoration of Drainage System at the downstream face of Singda Dam
5. Construction of inspection paths on the upstream and downstream slope of Singda Dam

##### **Electro-mechanical Work**

6. Replacement and installation of Butterfly Valves and lift for operational service in the control shaft of Singda Dam
7. Construction of generator shed i/c supplying, fixing, and commissioning of generator for operating the butterfly valve
8. Construction of Stainless Steel railing at Spillway and Top of Dam

##### **Basic Facilities Enhancement:**

9. Clearing of range vegetation, grass, bushes wood, tress and Singda Dam
10. Restoration of side drain along the approach roads
11. Improvement of approach roads
12. Construction of compound wall fencing
13. Rehabilitation /construction of site office building, quarters, control room, etc.
14. Restoration of retaining wall existing approach road
15. Construction of water tank and distribution system
16. Electrification of dam area

### **Instrumentation, SCADA, Surveillance system, etc**

Supply and installation of Geodetic equipment (ETS, GNSS, digital levels), Geotechnical equipment (Piezometer, tilt meters), Seismic equipment, Hydro meteorological equipment, Surveillance system, Flood Monitoring and Command and Control Room Hardware/Software and Network Communication of Singda Dam.

*Out of above activities, desilting measure shall be taken up only after carrying out Bathymetric survey to know the present capacity of the reservoir, thereafter a detailed proposal on the desilting measures including check dams, desilting in the upstream Nalla (small stream), soil conservation measures/catchment area treatment shall be submitted by the state Government for examination. Therefore, these are not considered as part of present ESIA. Similarly, the above tourism components are not considered as part of present ESIA study as state government shall prepare a detailed proposal incorporating the tourism facilities to be provided along with expected tourists who will be visiting and the revenue being generated and submit for examination before taking up on the ground.*

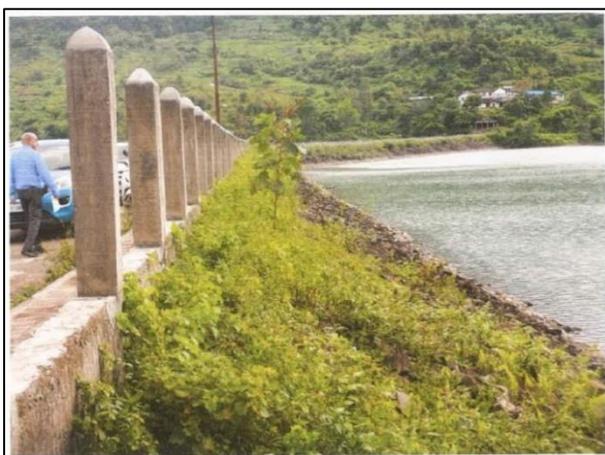
**Conducting of ESIA on these sub-components will be made a pre-requisite in the Environment and Social Commitment Plan (ESCP) before issuance of bids.**

Some pictures of the above interventions area are given at **Figure 1.1**. Project area on google map with major intervention locations marked is given at **Figure 1.2**.

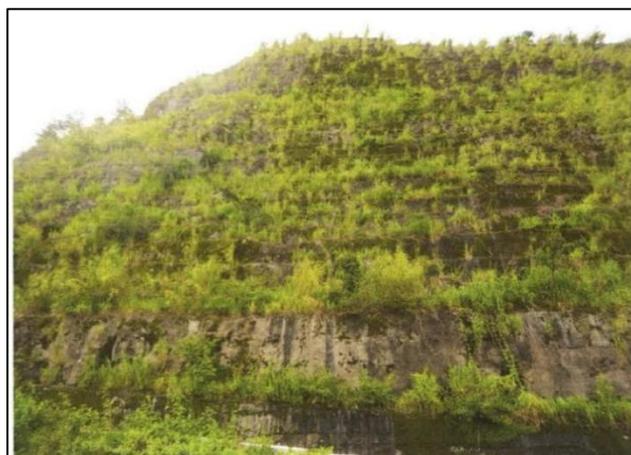
### **Implementation Schedule**

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Timelines for implementing above proposals has been proposed as 60 months.



**Photo showing disintegration of Rip-Rap**



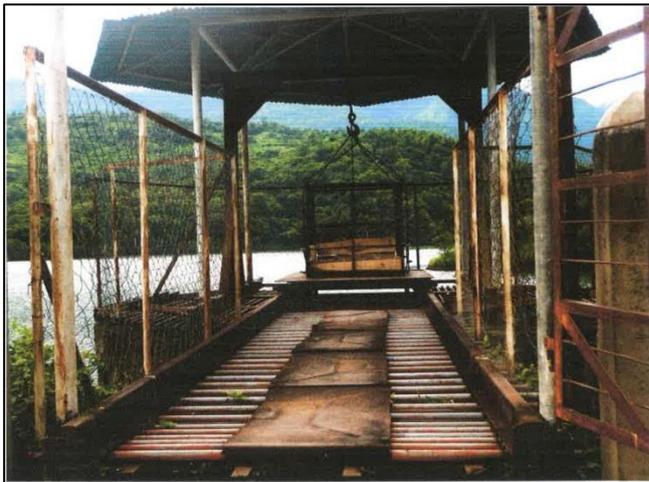
**Profuse vegetation growing on the slope**



**Landslide the sloping portion of Spillway**



**Landslide at the upstream of the Reservoir**



**Lifting arrangement for operating platform of valve**



**Winch for lift cage operation**

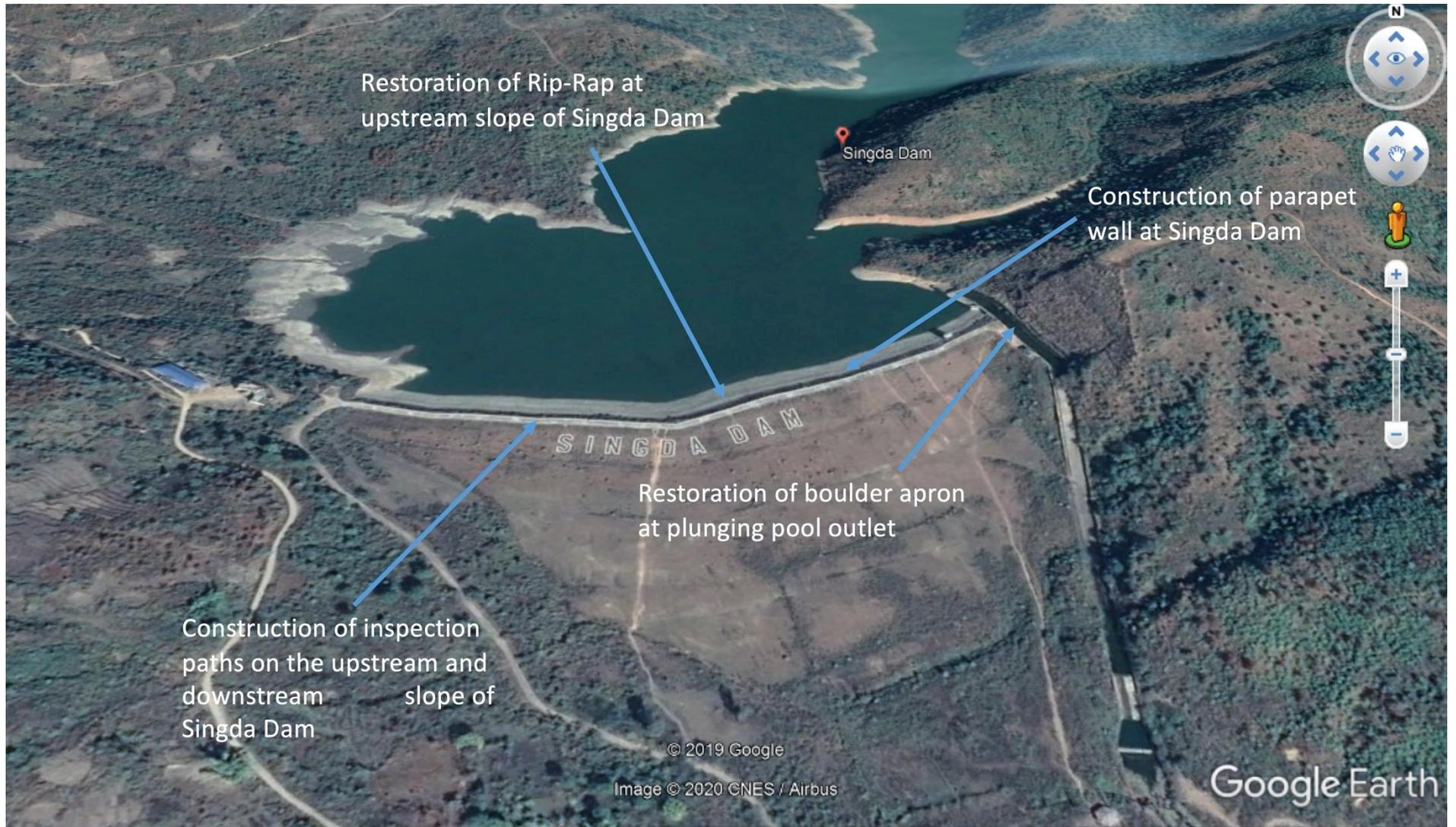


**Distressed approach road to the top of dam**



**Distressed approach road to Inspection Bungalow**

**Figure 1.1: Selected Photographs of Improvement/Intervention area**



**Figure 1.2: Project Area showing major intervention locations**

### **1.3 PURPOSE OF ESIA**

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The overall project (DRIP II) was categorized as **High Risk** as per the internal Environment and Social Risk Classification of the Bank. Hence, a separate agency was contracted to conduct the Environment and Social Impact Assessment to use it as a tool for decision-making on the sub-project. Specifically, the objectives of the ESIA are:

- i. To identify, evaluate and manage the environment and social risks and impacts of the 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 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 and identify areas for enhanced capacity towards management of E&S risks

### **1.4 APPROACH AND METHODOLOGY OF ESIA**

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The following approach has been adopted for ESIA:

- i. Study sub-project information, proposed interventions, their magnitude and locations and carry out assessment of each proposed intervention to identify the magnitude of risk and impacts
- ii. Conduct site visit to understand baseline environment and social settings, proposed activities under the sub-project, their location and sensitivity, if any.
- iii. Conduct stakeholder consultations to help identify potential stakeholders;
- iv. Prepare baseline data essential for impact assessment for immediate vicinity area of proposed interventions from secondary sources, such as land-use, protected areas in vicinity, habitation, access roads, ascertain presence of indigenous (schedule tribe)/vulnerable people, etc.
- v. Review relevance and applicability of national and state legal requirements and Bank's ESF policy, standards and directives and preliminary assessment of impacts as per ESS framework (2-8), suggest mitigation measures in accordance with the requirements of each applicable standard
- vi. Undertake institutional assessment to identify existing capacities & relevant gaps to manage E&S risks and impacts
- vii. Based on above assessment, justify the potential risk to establish the requirement of preparation of detailed ESIA/regulatory clearances, if any.

All formats used for collection of the above information, checklists used for consultations and photographs towards preparation of the Draft ESIA report are available in the project files.

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, social, wildlife protection, and forests conservation. The applicability of environmental laws to dam are mostly at setting up new dams compared to rehabilitation stage. The applicability screening of applicable regulations pertaining to all the above four categories is carried out and summarized at section 2.1.

Central Water Commission, Ministry of Jal Shakti, Government of India has also prepared “Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects” 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 screening.

The world Bank safeguard framework has defined ten standards (ESS1 to ESS10 and 2 Directives). The standard specific requirements and applicability of each standard to the proposed rehabilitation proposals is analysed and presented at section 2.2.

## 2.1 APPLICABILITY ANALYSIS OF INDIAN REGULATION

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The regulatory applicability analysis to the proposed rehabilitation work has been carried out considering nature of improvements, methodology of construction/improvement, material requirement, sourcing and transportation mode, and waste generation. The regulatory applicability analysis is summarised at **Table 2.1** below.

**Table 2.1: Applicable Legal Requirement**

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
1	Environment Protection Act/Rules-1986	To protect and improve overall environment	Yes	Applicable to all activities in general	None	MoEF&CC
2	The Forest (Conservation) Act, 1980 and amendments and The Forest (conservation) Rules 1981 and amendments	To help conserve the country's forests. It strictly restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of the Government. To this end the Act lays down the pre-requisites for the diversion of forest land for non-forest purposes	No	No diversion of forest land involved	None	Forest Department
3	Coastal Regulation Zone (CRZ) notification 2011 and amendment till date	To regulate development activities within the 500 m of high tide line in coastal zone and 100 m of tidal influence rivers.	No	Project is not located in coastal area	None	SCZMA,
4	Air (Prevention and Control of Pollution) Act, 1981, 1987	An Act to prevent and control Air pollution	Yes	Air pollution from proposed activities During construction stage	Consent to establish and operate by contractor for operation of Dg sets and any other air pollution system like ready mix plant etc.	SPCB
5	Water Prevention and Control of Pollution) Act, 1974, 1988	An Act to prevent and control water pollution.	Yes	Water pollution from proposed activities during construction stage	Consent to establish and operate by contractor for setting up construction camp/labour camp	SPCB
6	Noise Pollution (Regulation and Control Act) 2000 and amendment till date	Ambient Noise Standards for different areas and zones	Yes	Noise emission from proposed activities during construction stage like operation of DG sets	None	CPCB & SPCB
7	Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016	Protection to general public against improper handling storage and disposal of hazardous wastes. The rules prescribe the management	Yes	Hazardous waste generation from proposed activities like	Authorisation for handling of hazardous wastes	SPCB

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		requirement of hazardous wastes from its generation to final disposal.		generation of paints waste, used oil/waste oil		
8	Manufacture Storage, & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date	Usage and storage of hazardous substances	Yes	Painting is proposed which will require use of solvents/thinners which will falls under hazardous chemicals category	Arrange MSDS and store quantity of hazardous chemicals below threshold quantity	Chief Inspector of Factories
9	The Batteries (Management and Handling) Rules 2001	To regulate the disposal and recycling of lead acid batteries	No	Batteries will not be used for proposed activities	None	SPCB
10	Construction and Demolition Waste Management Rules , 2016	To manage the demolition and construction waste and prevent environmental degradation	Yes	Construction and demolition waste will be generated from proposed activities	Contractor needs to submit plan for reuse or safe disposal	Local bodies of the area
11	Solid Waste Management Rules, 2016	To manage solid waste or semi-solid domestic waste, sanitary waste,	Yes	Solid Waste will be generated from proposed activities due to influx of labour	Contractor needs to submit plants for its safe disposal/burial	Local bodies of the area
12	Motor Vehicle Act 1988 and amendment till date	To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution.	Yes	Transportation of manpower and material	None	Motor Vehicle Department (Licensing authority, registration authority & State Transport Authorities)
13	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Yes	gas cylinders will be used during welding and other electromechanical work. Storage within threshold	None	PESO

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
				quantity and as per capability analysis. Handling with define safe practices		
14	Ancient Monuments and Archaeological Sites and Remains Act, 1958	Conservation of cultural and historical remains found in India.	Yes	Presence of historical sites of archaeological importance	None	Archaeological Dept. Gol
15	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	To regulate the employment and conditions of service of buildings and other construction workers and to provide for their safety, health and welfare measures and for other matters connected therewith or incidental thereto.	Yes	Involvement of workforce/labour	None	Labour Commissioner
16	Plastic waste management Rules, 2016	To manage the plastic waste generated so as it does not affect the water pipeline, animals and other environmental components	Yes	Plastic waste generation from proposed activities. Safe disposal as per Rules	None	Local bodies of the area
17	E-Waste Management Rules, 2016	Protection of environment against improper handling storage and disposal of hazardous waste.	Yes	E-waste generation from replacement of instrumentation. Safe disposal as per rules	None	CPCB &SPCB
18	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Regulates land acquisition and lays down the procedure and rules for granting compensation, rehabilitation and resettlement to the affected persons	No	Land Acquisition is not involved	None	Revenue Department/District Administration
19	Rights of Persons with Disabilities Act, 2016	Ensures that the Persons with Disability ( <b>PWD</b> ) enjoy the <b>right</b> to equality, life with dignity, and respect	Yes	Persons with disability	None	

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		for his or her own integrity equally with others.				
20	Right To Information Act, 2005	Mandates timely response to citizen requests for government information	Yes	Borrower is government organization	None	Any Government Department
21	Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	To recognize and vest the forest rights and occupation in forest land in forest dwelling STs and other traditional forest dwellers who are residing in such forests for generations but whose rights could not be recorded. Its objective is to facilitate the overall development and welfare of the tribal people by empowering them socially, economically, politically without any impact on their culture, habitation and tradition and in terms of their age old rights and privileges.	No	No such activities are proposed	The Gram Sabha resolution for determining the nature and extent of individual or community forests rights	Ministry of Tribal Affairs
<b>Major Labour Laws Applicable To Establishments Engaged In Building And Other Construction Work</b>						
1	Employees Compensation Act 1923	The Act provides for compensation in case of injury, disease or death arising out of and during the course of employment.	Yes	Contractor/Labour engagement	None	Commissioner for Workmen's Compensation
2	Payment of Gratuity Act 1972	Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.	Yes	Contractor/Labour engagement	None	Chief Labour Commissioner
3	Employees P.F. and Miscellaneous Provision Act 1952 ( <i>since amended</i> )	The Act provides for monthly contribution by the employer plus	Yes	Contractor/Labour engagement	None	Ministry of Labour

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		workers @ 10% or 8.33%. The benefits payable under the Act are:				
4	Maternity Benefit Act 1961	The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.	Yes	Contractor/Labour engagement	None	Chief Labour Commissioner
5	Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013	This Act defines sexual harassment in the workplace, provides for an enquiry procedure in case of complaints and mandates the setting up of an Internal Complaints Committee or a Local Complaints Committee	Yes	Contractor/Labour engagement	None	District Officer (District Magistrate or Additional District Magistrate or the Collector or Deputy Collector)
6	Contract Labour (Regulation & Abolition) Act 1970	The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
7	Minimum Wages Act 1948	The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
8	Payment of Wages Act 1936	It lays down the mode, manner and by what date the wages are to be paid,	Yes	Contractor/Labour engagement	None	Chief labour Commissioner

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		what deductions can be made from the wages of the workers.				
9	Equal Remuneration Act 1976	The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
10	Payment of Bonus Act 1965	The Act is applicable to all establishments employing 20 or more employees. Some of the State Governments have reduced this requirement from 20 to 10. The Act provides for payments of annual bonus subject to a minimum of 8.33% of the wages drawn in the relevant year. It applies to skilled or unskilled manual, supervisory, managerial, administrative, technical or clerical work for hire or reward to employees who draw a salary of Rs. 10,000/- per month or less. To be eligible for bonus, the employee should have worked in the establishment for not less than 30 working days in the relevant year. The Act does not apply to certain establishments.	Yes	Contractor/Labour engagement		Chief labour Commissioner
11	Industrial Disputes Act 1947	the Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations, a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.	Yes	Contractor/Labour engagement	None	Ministry of Labour and Employment
12	Trade Unions Act 1926	The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have	Yes	Contractor/Labour engagement	None	Ministry of Labour and Employment

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		been given certain immunities from civil and criminal liabilities.				
13	Child Labour (Prohibition & Regulation) Act 1986	The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in the Building and Construction Industry.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
14	Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979	The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
15	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Building and Other Construction Workers Welfare Cess Act, 1996 (BOCWW Cess Act)	All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under these Acts. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be notified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as Canteens, First - Aid facilities,	Yes	Contractor/Labour engagement	None	Chief labour Commissioner

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.				
16	Factories Act 1948	the Act lays down the procedure for approval of plans before setting up a factory engaged in manufacturing processes, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power.	Yes	Contractor/Labour engagement	None	Chief Inspector of Factories
17	Bonded Labour System (Abolition) Act, 1976	The Act provides for the abolition of bonded labour system with a view to preventing the economic and physical exploitation of weaker sections of society. Bonded labour covers all forms of forced labour, including that arising out of a loan, debt or advance.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
18	Employer's Liability Act, 1938	This Act protects workmen who bring suits for damages against employers in case of injuries endured in the course of employment. Such injuries could be on account of negligence on the part of the employer or persons employed by them in maintenance of all machinery, equipment etc. in healthy and sound condition.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
19	Employees State Insurance Act 1948	The Act provides for certain benefits to insured employees and their	Yes	Contractor/Labour engagement	None	Chief labour Commissioner

S. No.	Legislation	Purpose	Applicability	Reason	Type of permit/specific action and stage of applicability	Administrative Authority
		families in case of sickness, maternity and disablement arising out of an employment injury. The Act applies to all employees in factories (as defined) or establishments which may be so notified by the appropriate Government. The Act provides for the setting up of an Employees' State Insurance Fund, which is to be administered by the Employees State Insurance Corporation. Contributions to the Fund are paid by the employer and the employee at rates as prescribed by the Central Government. The Act also provides for benefits to dependents of insured persons in case of death as a result of an employment injury.				
20	The Personal Injuries (Compensation Insurance) Act, 1963	This Act provides for the employer's liability and responsibility to pay compensation to employees where workmen sustain personal injuries in the course of employment.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner
21	Industrial Employment (Standing Order) Act 1946	It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.	Yes	Contractor/Labour engagement	None	Chief labour Commissioner

## 2.2 APPLICABILITY ANALYSIS OF WB ENVIRONMENTAL AND SOCIAL FRAMEWORK STANDARDS

The World Bank Environmental and Social Framework comprises Policy, 10 standards and 2 Directives. The applicability of these standard vary depending on nature of activities. This applicability analysis is presented at **Table 2.2** below.

**Table 2.2: Relevance and requirements ESF Policy, Standards and Directives**

ESF Policy, Standards and Directives & Guidelines	Applicable Activities	Applicability / Requirements
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	All projects, sub-projects and associated facilities	Applicable (a) Conduct an environmental and social assessment of the proposed project, including stake- holder engagement; (b) Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10; (c) Develop an ESCP, and implement all measures and actions set out in the legal agreement including the ESCP; and (d) Conduct monitoring and reporting on the environmental and social performance of the project against the ESSs
ESS2: Labour and Working Conditions	Engagement of labour for various civil, paint and electro-mechanical or any other activities as part of rehabilitation proposal. It applies to project workers including full- time, part-time, temporary, seasonal and migrant workers. It covers working conditions, protecting workforce, Grievance Mechanism and Occupational Health and Safety (OHS).	Applicable a) Preparation of Labour Management Procedures applicable to the project. b) Preparation of Grievance Mechanism and sharing with all the workers c) Design and Implement OHS measures
ESS3: Resource Efficiency, Pollution Prevention and Management	Resource consumption and pollution generation from proposed activities (civil, electromechanical and paint work). This includes both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases	Applicable a) To assess the resource requirement and implement technically and financially feasible measures for improving efficient consumption of energy, water and raw materials, as well as other resources. b) Preparation of Resource Efficiency and Pollution Prevention Plan to assess and minimize/control the concentration of release of pollutants to air, water and land due to routine, non-routine, and accidental circumstances, and with the potential for local, regional, and transboundary impacts.
ESS 4: Community Health and Safety	Applies to potential risks and impacts on communities that may be affected by project activities such as transportation of material to project site through village roads, labour colony housing migrant workers near the project site,	Applicable a) Pollution from project activities and labour colony and increased traffic causing pollution and road safety risks on village roads during transportation of material. b) Preparation of Emergency Response Procedure (ERP) to prevent injuries to health and safety of the community during an emergency event arising from

ESF Policy, Standards and Directives & Guidelines	Applicable Activities	Applicability / Requirements
	pollution generation from civil and electro-mechanical work.	both natural and man-made hazards, typically in the form of fire, explosions, leaks or spills, flooding, etc.
ESS 5: Land Acquisition, Restrictions on Land use and Involuntary Resettlement	Applies to permanent or temporary physical and economic displacement resulting from land acquisition or restrictions on land use undertaken or imposed in connection with project implementation.	Not Applicable Proposed interventions are limited to the existing dam and will take place on the existing dam structure and within its premises. Any of the proposed activities/interventions, does not 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.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	Applies to all projects that potentially affect biodiversity or habitats, either positively or negatively, directly or indirectly, or that depend upon biodiversity for their success.	Not Applicable The present interventions do not involve any tree cutting or impacting any forest area in any way. Activities remain limited to the dam area only. Impacts on wildlife including that on fish fauna in the river are negligible due the nature and location of activities proposed under this sub-project. There is no national park/wildlife sanctuary/Conservation Reserve within 10 Km of the project. No direct or indirect impacts on biodiversity are envisaged due to proposed interventions.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Tradition Local Communities	Applies to traditional communities or schedule tribes, if they are present or have collective attachment to a proposed project area, as determined during the environmental and social assessment. This ESS applies regardless of whether such Communities are affected positively or negatively, and regardless of the significance of any such impacts.	Not Applicable The project interventions do not directly or indirectly impact schedule tribe.
ESS 8: Cultural Heritage	Applies to all projects that are likely to have risks/impacts on cultural heritage	Not Applicable Project is not directly or indirectly impacting any cultural heritage as no such sites are in proximity to the project site. Access to temples/religious places in surrounding villages will not be blocked/hampered due to any of the proposed interventions as such activities are limited to dam only.
ESS 9: Financial Intermediaries	Applies to Financial Intermediaries (FIs) that receive financial support from the Bank. FIs include public and private financial services providers, including national and regional development banks, which channel financial resources to a range of economic activities across industry sectors.	Not Applicable - Project does not have any FIs

ESF Policy, Standards and Directives & Guidelines	Applicable Activities	Applicability / Requirements
ESS 10: Stakeholder Engagement and Information Disclosure	Applies to all projects supported by the Bank through Investment Project Financing. The Borrower will engage with stakeholders as an integral part of the project's environmental and social assessment and project design and implementation	Applicable for the dam as a whole and in particular in relation to the non-structural interventions involving Early flood Warning system having siren systems, broadcasting facilities, etc. Preparation of Stakeholder Engagement Plan Establishment of a project level GRM
Environmental and Social Directive for Investment Project Financing	This Directive applies to the Bank and sets out the mandatory requirements for the implementation of the Environmental and Social Policy for Investment Project Financing (IPF).	Applies to Bank in addressing E&S aspects of this project
Bank Directive Addressing Risks and Impacts on Disadvantaged or Vulnerable Individuals or Groups	This Directive establishes directions for Bank staff regarding due diligence obligations relating to the identification of, and mitigation of risks and impacts on, individuals or groups who, because of their particular circumstances, may be disadvantaged or vulnerable	Applies to Bank in addressing E&S risks and impacts on disadvantaged and vulnerable persons or groups that are identified in this project
World Bank's Guidance note on managing the risks of adverse impacts on communities from temporary project induced labor influx, 2016	The document provides guidelines to address issues and risks arising from influx of migrant labour leading to gender-based violence, forced labour etc.	Not applicable as even though influx of skilled migrant labour in construction works is likely, these labor will operate within the dam premises which is a restricted access zone and distant from habitations. However, GBV related clauses would be included in the bid documents and sensitization/awareness trainings would be provided to all dam personnel, contractors, etc. during implementation

## **2.3 INSTITUTIONAL FRAMEWORK**

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The sub-project will be implemented by Water Resources Department (WRD), Manipur. The mandate of WRD is:

- All matters relating to Medium and Major Irrigation Projects
- All matters relating to Lift Irrigation Projects
- All matters relating to management of floods, including construction of major dams and drainages
- All matters relating to Management and Preservation of Water Resource
- All matters relating to investigation of Ground Water Resources

Fore implementation of the sub-project, SPMU has been set up to be headed by Chief Engineer (Project) as Nodal Officer. Project Director (SE Irrigation Circle No. II) and 3 Asstt. Project Directors (Executive Engineers) will report to him. In addition, technical, finance and safeguard sections have been created under Project Director for implementation of the project. Safeguard section will appoint Environment and Social Expert to enable preparation of management plans as well subsequent implementation of mitigation measures during implementation. They will hire experts from outside department or seek deputation of staff with relevant experience.

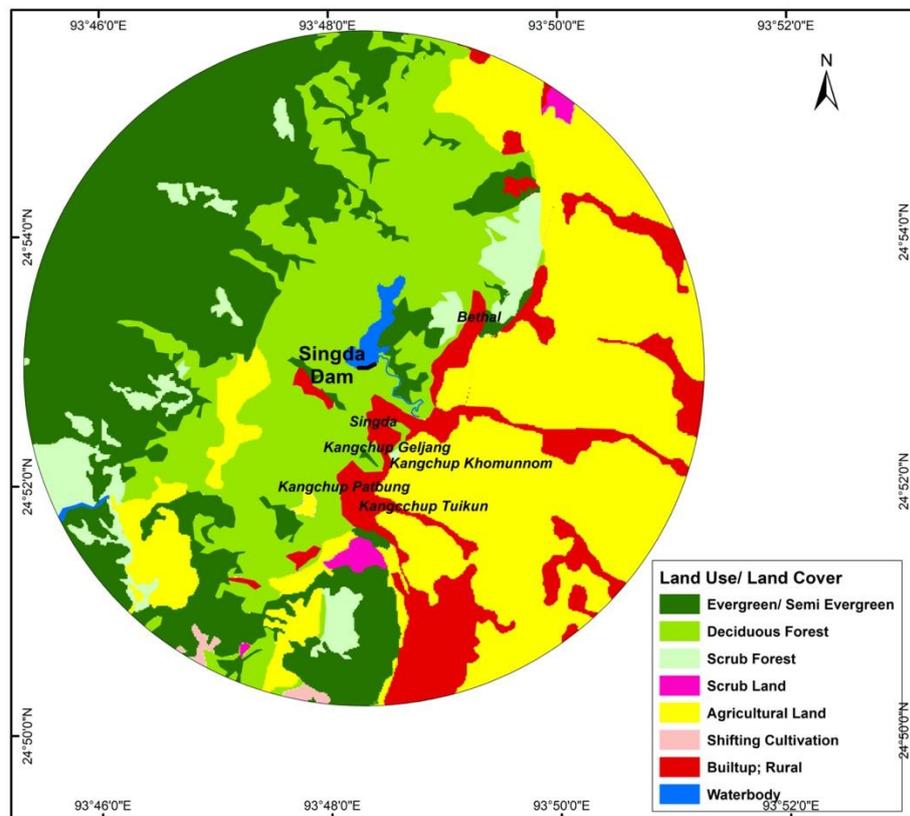
Presently, no formal system is established for dealing with external complaints.

The baseline conditions are analysed based on secondary information and site observations and are presented in following order Physical, Biological, Protected area and Socio-economic profile.

## 3.1 PHYSICAL ENVIRONMENT

### Land Use/ Land Cover

The project surrounding area's land use and environmental sensitivity was analysed using GIS techniques. Land use/ land cover map of 5 Km radius area around the dam site is presented at **Figure 3.1**. As can be seen from the map, the reservoir is very small (only 51 ha), major land use upstream of dam is forest – evergreen/semi-evergreen and deciduous. Downstream of dam, patches of built up area can be seen as well large area under agriculture. Nearest habitation is at around 3 Km from the dam.



**Figure 3.1: Land Use and Land Cover Map of 5 Km radius around Dam**

### Ambient Air Quality and Noise

Ambient air quality is regularly monitored by Manipur Pollution Control Board (MPCB) at their office location located in Imphal, which is about 17 Km away from the dam. Data for the period January to December 2019 has been provided by MPCB. Every month 8 set of readings were taken as per norms i.e. twice a week (non-consecutive days) for four weeks.

Parameters monitored are PM<sub>10</sub>, NO<sub>2</sub> and SO<sub>2</sub>. NO<sub>2</sub> and SO<sub>2</sub> values for all the samples for the entire year were well within the limits prescribed by CPCB for industrial residential rural and other areas i.e. not to exceed 80 µg/m<sup>3</sup> for each parameter. On the other hand, PM<sub>10</sub> is found to exceed the prescribed limit of 100 µg/m<sup>3</sup> for most part of the year except for monsoon months of July-October. In August all values of PM<sub>10</sub> are well within the limits, whereas for July, Sept and October, most of the values were found to be within limits. This is due to the dust suppression during the monsoon.

MPCB monitoring location lies in urban area with substantially higher traffic as compared to dam area and therefore, it is expected that air quality at dam will be much cleaner in terms of PM<sub>10</sub> levels as that of monitored value. This was also observed during the visit to dam.

Site-specific data of sound levels at project site is not available. However, general observation is made during site visit that area is generally quiet and except for limited number of vehicular movement and tourists, there is no source of noise in the area.

### Water Quality

Laishram & Alam (2019) collect and analysed water samples form thirty (30) sampling locations from Nambul (Singda) river during the two seasons to study both temporal and spatial changes. Most of the parameters were found to be in limits except for turbidity, which was found exceeding the desirable and permissible standards prescribed by the World Health Organization and Bureau of Indian Standards. Turbidity was particularly higher during monsoon during monsoon (Table 3.1).

**Table 3.1: Water Quality of Singda River**

	Parameters	Unit	Pre-monsoon			Monsoon			WHO limit	BIS permissible limit
			Min	Max	Avg	Min	Max	Avg		
1	Temp.	°C	25.6	31	28.04	26.7	30.2	27.9	-	-
2	pH		6.93	7.69	7.06	6.84	7.06	6.94	6.5-8.5	6.5-8.5
3	EC	µS/cm	180	590	365.7	60	200	127	250	250
4	TDS	ppm	130	420	240.3	40	140	89	-	2000
5	Salinity	ppt	0.1	0.3	0.16	0	0.1	0.05	-	-
6	DO	ppm	1.42	5.99	3.15	1.54	4.11	2.87	-	-
7	BOD	mg/L	3.3	10.73	6.55	-	-		-	-
8	Turbidity	NTU	12.9	76.8	37.3	194.4	363.2	280.5	5	5
9	Cl <sup>-</sup>	mg/L	7.49	42.49	26.66	2.49	12.49	7.24	250	1000
10	Ca <sup>2+</sup>	mg/L	4.81	17.64	12.88	4.81	9.62	7.06	75	200
11	Mg <sup>2+</sup>	mg/L	7.81	12.69	9.82	0.98	5.86	2.8	50	100
12	HCO <sub>3</sub> <sup>-</sup>	mg/L	25	90	50	10	25	15.2	-	600
13	SO <sub>4</sub> <sup>2-</sup>	mg/L	11.91	28.69	19.22	46.99	74.47	59.1	500	400
14	NO <sub>3</sub> <sup>-</sup>	mg/L	0.31	2.4	0.94	3.38	16.18	7.14	50	45
15	PO <sub>4</sub> <sup>3-</sup>	mg/L	0	0.5	0.36	0.2	0.6	0.44	0.3	-
16	Na <sup>+</sup>	ppm	8.77	24.98	16.11	3.14	9.47	6.14	200	200
17	K <sup>+</sup>	ppm	4.13	14.48	8.46	4.04	9.17	5.94	-	-
18	Fe <sup>3+</sup>	mg/L	0.3	2	1.53	0.3	2	0.98	0.3	1

## Natural Hazards

Potential of natural hazards such as flooding and earthquake cannot be ruled out. Flooding in Singda river especially during sudden release or emergency situation of dam break, downstream area will be affected. Project falls in earthquake zone V, i.e. the most active zone. 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.

Being in Zone V, the most active zone, earthquakes of low to moderate intensity are recorded here regularly. The state of Manipur, has experienced dozens of large earthquakes; the biggest in recent times being the 1988 (magnitude 7.2) earthquake. Most earthquakes in western Manipur are shallow. But some, especially those recorded in the eastern parts and along and across the Myanmar border have greater depths. Other earthquakes in recent times include:

- 18 September 2005 (magnitude 5.7) - A moderate earthquake at Myanmar-Manipur border, caused isolated minor damage to property in some parts of Manipur.
- 4 September 2009 (magnitude 5.9) - A moderate earthquake at Myanmar-Manipur border, felt widely in north-east India and in Bangladesh. No reported damage.
- 4 January 2016 (magnitude 6.7) - Imphal earthquake with epicenter in the Tamenglong district; about 30 km west of Imphal. At least eleven people were killed, 200 others were injured and numerous buildings were damaged. The quake was also strongly felt Bangladesh and eastern and north-eastern India

Keeping in view the seismic activity on the region, Dam Safety Review Panel has already recommended carrying out a site-specific design earthquake parameters study to ascertain the requirement of additional safety measures, if any.

## 3.2 BIOLOGICAL ENVIRONMENT

### Flora and Fauna

The Kangpokpi district shows three prominent units i.e. tiny plain topography, hilly area in the extreme north, central parts and marshy land in the southern parts of the district. It is a narrow valley sand witch between two-hill ranges running north to south. The forests of area consist of tropical moist deciduous forests and Northern sub-tropical broad leaved hill forests. Major species present in each forest type are tabulated below.

S.N.	Group	Forest types	Major Species
1	Group-3 (Tropical moist deciduous forests)	East Himalayan moist deciduous forests	<i>Quercus semiserrata</i> , <i>Q. griffithii</i> , <i>Castanopsis hystrix</i> , <i>C. armata</i> , <i>Q. pachyphylla</i> , <i>Schima wallichii</i> , <i>Engelherdtia</i> spp., <i>Alnus nepalensis</i> , <i>Amoora rohituca</i> , <i>Eugenia precox</i> , <i>Lagestroemia</i> spp., <i>Termanalia myriocarpa</i> , <i>Duabanga grandiflora</i> , <i>Cinnamomum</i> spp., <i>Sterculia villosa</i> , <i>Cedrella serrata</i> , <i>Phyllanthus</i>

			<i>excelsa, Ficus cunii, Bauhinia purpurea, B. variegata, Callicarpa arborea, Macaranga peltata, Mussaenda frondosa, Ficus glomerata, Celtis australis, Erythrina indica, Pterocarpus acerifolium, Terminalia citrina, Albizzia lebbeck, Mallotus philippensis, Hymenodictyon excelsum, Rhus semialata, Pandanus spp, Aphanomixis polystachya, Canarium strictum, Careya arborea, Chukrassia tabularis, Dillenia pentagyna, D. indica, Macaranga denticulata, Stereospermum personatum, Desmodium, Impatiens, Mimosa, Oxalis, Melastoma malabathricum etc.</i>
2	Group-8 (Sub tropical broad leave forest)	Northern sub tropical wet hill forests	<i>Alnus nepalensis, Albizzia spp., Betula alnoides, Castanopsis tribuloides, Cinnamomum glaucescens, Elacocarps spp., Engelherdtia spicata, Erythrena stricta, Magnolia insignis, Michelia cathcartii, Termanalia myrioacarpa, Schima wallichii, Pheobe hainesiana, Albizzia spp., Rhus semialata, Syzygium Jambos, recea, alsaminaceae, Bignoniaceae, Commelinaceae, Zingiberaceae, etc.</i>

Forest area has a diverse assemblage of wild life harbouring many species of mammals, birds, reptiles & amphibian, fishes and insects. The main Carnivores are Leopard, Jungle cat, Jackal, Mongoose, Civet cat, Fox, etc. The main Herbivores are Sambar, Deer, Wild boar, Monkey, etc. Among the small Mammals, Langur, Porcupine, Pangolins are to be mentioned.

Avian fauna is represented by Burmese peafowl, Moorhen, Blyth's tragopan, Mrs. Hume's bar-backed pheasant, Red Jungle fowl and 3 species of Hornbills viz. Great Indian Hornbill, Rufous-necked hornbill, Wreathed hornbill, etc.

Proposed activities remain limited to dam area and therefore no risk is envisaged on flora and fauna in the surrounding areas.

### **Fish & Fisheries**

The comprehensive survey was carried out by Suresh et.al. (2005), the study revealed 125 species of fishes in Manipur state. Out of 125 fish species 53 species belonging to 31 genera and 15 families are reported from the river, streams and lakes of the study area. Cyprinidae is the predominant family with various major and minor carps along with cat fish. Some of the species in river area *Amblypharyngodon mala, Barilius barila, Barilius dogarsinghi, Barilius vagra, Chela laubuca, Esomus danricus, Garra gotyla gotyla, Garra lamta, Garra lissorhynchus, Garra litanensis, Garra manipurensis, Garra nasuta, Garra rupecula,*

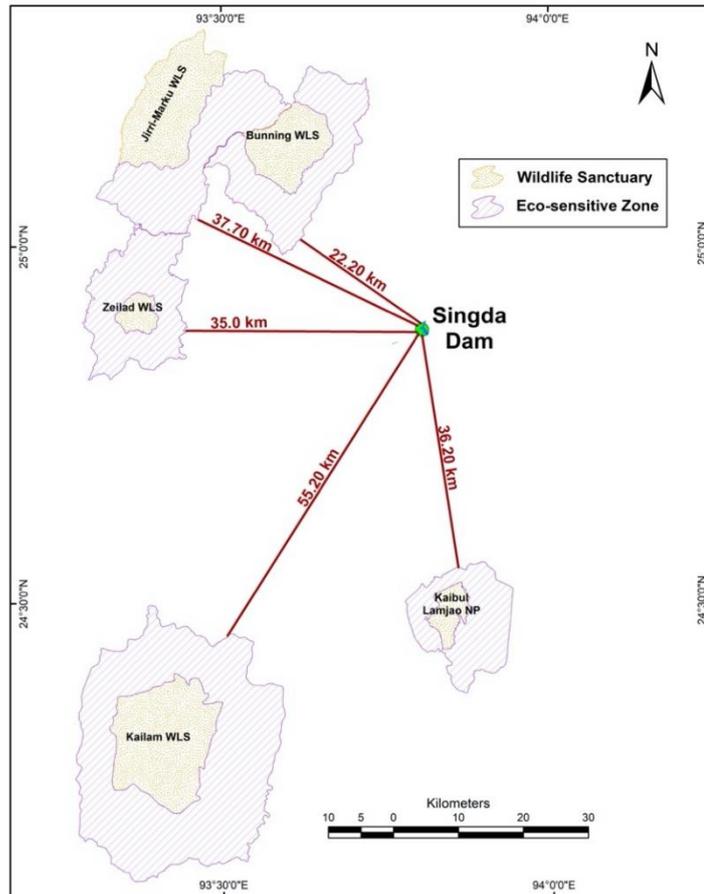
*Neolisocheilus hexagonolepis*, *Osteobrama belangeri*, *Osteobrama cotio* and *Parluciosoma daniconius*.

None of the proposed activities under the sub-project will impact water quality of river and therefore, there is no risk/impact on fish fauna.

### 3.3 PROTECTED AREA

#### Nearest Protected Area

There is no protected area within 10 Km distance from the dam. Nearest protected area is Bunning WLS at a distance of 22.2 Km from the dam. The location of protected areas in relation to dam is shown below at **Figure 3.2**.



**Figure 3.2: Map showing location of Protected Areas wrt Dam**

### 3.4 SOCIAL ENVIRONMENT

The dam is located in the district Kangpokpi. Six villages namely Singda, Kangchup Geljang, Kangchup Patbung, Kangchup Khomunnom, Kangchup Tuikon and Bethel have been identified as falling in 5 km area on the downstream side of the dam. The district has nine sub-divisions i.e. nine Tehsil Headquarters. The brief demographic characteristic of the district is given in the table below:

<b>No. of Households</b>	<b>36,000</b>	<b>Household Size</b>	<b>5</b>
<b>Total Population</b>	<b>1,93,744</b>	<b>Population (0-6 age)</b>	<b>26,232</b>
Male	98,908	Boys (0-6 age)	13,679
Female	94,836	Girls (0-6 age)	12,553
Sex Ratio	959	Sex Ratio (0-6)	918
<b>Population (SC)</b>	<b>714</b>	<b>Population (ST)</b>	<b>1,54,528</b>
Male	387	Male	77,127
Female	327	Female	77,401
<b>Literates</b>	<b>1,24,182</b>	<b>Literacy Rate</b>	<b>74.1</b>
Male	68,169	Male	80.0
Female	56,013	Female	68.1
<b>No. of Workers</b>	<b>88,065</b>	<b>Cultivators</b>	58,987 (67.0%)
Male	50,198	<b>Agricultural Labours</b>	7,353 (8.3%)
Female	37,867	<b>Household Industrial Workers</b>	3,117 (3.5%)
<b>No. of Main Workers</b>	1,66,009	<b>Other Workers</b>	18,608 (21.1%)
<b>No. of Marginal Workers</b>	47,378		
<i>Source: Census of India, 2011 (District Handbook)</i>			

Total population of the study area (vicinity villages) has been worked out to 1,365. The gender wise distribution of the above population is 731 (53.55%) male and 634 (46.45%) female. The overall sex ratio of the study area has been worked out to 867 females per 1,000 males. Total population of the study area is distributed into different social groups like Scheduled Tribe (ST) and General Category (including OBC). The share of these social groups' population to the total population of the study area is 93.92% and 6.08% respectively. There is no population belonging to Scheduled Caste category in proximity area.

In the study area, 77.73% of the population is literate in which male literates are 54.85% and that of females are 45.15%. The overall literacy rate in the study area has been worked out to 89.99%. The male literacy rate is 93.57% and female literacy rate is 86.00%, creating a gender gap in literacy rate of 7.57%.

The economic classification of workers as per Census 2011 is saying that total number of workers in the study area is 752 which constitute 55.09% of the total population. Of the total workers, 59.71% are males and remaining 40.29% are females. In absolute term, total number of male workers is 449 and that of female is 303. The gender gap in work participation rate is 19.42%. Agriculture is the main source of livelihood in the study area followed by 'Other Workers' and 'Household Industrial Workers'. Rice, Maize, Potato, Cabbage and cereals are the major agricultural products in the study area. Terrace cultivation is generally practice by the people.

'Household Industrial Workers' who is part of the small scale establishments run as a household industry involving production & manufacturing of handloom and handicraft products which is the only important industry with regard to employment potential particularly females. Bed sheets, mosquito nets, bamboo baskets, mats, fishing nets, furniture, carpentry products, pottery articles etc. are some of the notable products manufacturing by the people of the area. 'Other Workers' which include those activities engaged as government servants, municipal employees, teachers, construction workers, entertainment artists, trade, commerce, business, transport, banking etc.

Basic amenities like water supply for drinking and other uses are available from Tank and Tube wells etc. Electricity is available for domestic, agriculture, commercial & industrial uses in almost all over the study area. The study area having approach roads as Black Topped (Paved), Gravel and Footpath. As per the census data, a deficiency in health & educational institutions & facilities are observed in the proximity area/villages.

Data on population, occupation and amenities of vicinity villages haven been compiled from Census of India and is given at **Annexure I**.

### **3.5 CULTURAL ENVIRONMENT**

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List of Monuments of National Importance in Manipur and list of State Protected monuments in Manipur have been reviewed. There are no protected monuments in the project vicinity.

## 4.1 STAKEHOLDERS CONSULTATION

Stakeholder consultations were conducted as part of environmental and social impact assessments. 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

A stakeholder consultation meeting was conducted at dam site on 02/02/2020 and later at WRD office on 03/02/2020. It was attended by permanent staff of the borrower (WRD) working at dam, workers from nearby villages, locals, elected representatives and local welfare groups. Town planning department was also consulted on 03/02/2020.



Following is the outcome of the stakeholder consultation meetings:

1. The dam is main source of water supply to Imphal and nearby areas and the participants expressed that improvement works shall be taken up.
2. As it is a spillway without a gate, the participants opined that early warning and alerting measures be provided.
3. The Rip rap work is damaged and shall be attended to protect from erosion
4. The dam is visited by many tourists and it is requested to provide safety and security measures including fencing, lighting.
5. The stakeholders informed that the extent of silting is unknown and it may have an effect on the storage capacity. Desilting may be taken up.
6. The participants at the old quarters urged for immediate construction of quarters as the present place is in dilapidated condition
7. The WRD engineers are fully aware of the interventions but need training on ESF and related standards.
8. No formal fishing is noticed.
9. The participants informed that largescale greening is lost and greening works may be considered as part of the project.
10. About 15000 tourists visit the dam during the year.
11. The WRD team indicated the proposed labour camp site within the vacant area of the WRD site abutting the dam. The present landuse is vacant.
12. The WRD office maintains RTI process through which the public is provided with requested information. The WRD will set up 3 levels of GRM for the project – at site, at WRD and at Govt of Manipur.

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

**Affected parties:** 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 potential contractors, Project Management consultants, either regulatory bodies/institutional stakeholders such as Revenue, Environmental Authorities, etc. In relation to non-structural interventions, these would include: communities living downstream including farmers; village heads (Sarpanchs), 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 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.

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.

Based on the relevance of each Standard, as identified in the chapter on Legal, Regulatory and Institutional Framework, ensuing sections summarize the environmental and social risks and impacts likely due to the proposed interventions followed by the mitigation measures considered, for each relevant Standard. Table below, presents the Risk and impacts grouped in respect of the applicable ESS identified in chapter 3 earlier:

Applicable ESS	Risk and Impacts area assessed
ESS1- Assessment and Management of Environmental and Social Risks and Impacts	The risks and Impacts is carried out as per requirement of this standard
ESS2- Labour and Working Conditions	Types of Workers/labour and working conditions
ESS3- Resource Efficiency, Pollution Prevention and Management	Impact on Physiography/land use/Geology/Soil Impacts on water resources/Water Quality Impact on Air quality/Noise levels  Impact due waste generation/disposal
ESS4- Community Health and Safety	Impacts on Community Health and safety

### **5.1 ASSESSMENT AND MANAGEMENT OF E&S RISK AND IMPACT (ESS 1)**

Proposed intervention are categorised as civil, electromechanical and painting work requiring labour involvement for works and their stay at site for a period of about 5 years, use of resources such as water and power during construction, pollution generation from storage and handling of material, generation of waste, use of paints and other chemicals for construction activities, transportation of raw material, etc. In addition, labour intensive work always involves risks of accidents such as working at heights, working across river or on river banks, etc.

As all the proposed structural interventions are within the dam area, no adverse impacts are envisaged on communities including that on the disadvantaged or vulnerable people. On the contrary, all communities including disadvantaged and vulnerable persons and groups will indirectly benefit from these proposed interventions that shall enhance safety.

However, in case of non-structural interventions relating to early flood warning systems having siren systems, broadcasting facilities and Emergency Action Plans, project will need to make extra efforts to reach out to the disadvantaged and vulnerable persons and groups to involve them in both preparation and implementation.

### **5.2 LABOUR AND WORKING CONDITIONS (ESS 2)**

Water Resources Department, Manipur shall contract agencies to undertake civil works, agencies/firms to support core-functions; primary suppliers of material/equipment and other implementation support partners, and these could be from anywhere in the country. Construction works will require labour force and associated goods and services. Based on the construction package sizes and the project implementation schedule, the peak

construction workforce/manpower has been estimated as about 10 skilled workers sourced by contractor and about 25 unskilled workers sourced locally. They are expected to stay on site for a period of 5 years. In addition, there will be floating population of suppliers, transporters of material and their labour who will keep on moving in and out of the site during the work period of 5 years.

Labour camp will be set up at the WRD site office campus about 50 m from the entry side of dam. Water supply are available. A vacant building with about 10 rooms is available with water and power and sanitation facilities. Necessary modifications will be done for housing the contractor labour.

**Project shall comprise the following types of workers:**

1. **Direct workers:** Direct workers will include the project managers and supervisors, who are employees of WRD. The estimated number of direct workers is not likely to exceed 30 as per existing institutional arrangements and practices of WRD.
2. **Contracted workers:** All the work force deployed by the Contractors will be deemed to be contracted workers. The Contractor(s) might further engage multiple subcontractors. All work force of all such sub-contractors will be also deemed to be contracted workers. These will 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.

**Migrant Workers:** The migrant workers are that, who are employed for the Project but does not belong to the Project region and are not normally expected to return to their places of residence after work shift hours. The number of migrant workers in any contract package, would depend on decisions made by contractors, based on the locally available workforce and their skills for Project construction requirements. The migrant workers could be at all levels and include unskilled and semiskilled construction labour and could even comprise combination of male and women labour force. The migrant workers are either directly engaged by the contractor or through labour contractors, who supply the work force to as per the needs of the contractors.

3. **Primary Supply Workers:** No primary supplier or primary supply workers are anticipated as all goods and services essential to the core functions of the project shall be provided by the contractor – through a contract by Rajasthan WRD.
4. **Community Workers:** Community workers are envisaged under the Emergency Action Plans, who will be mostly volunteers for implementing parts of the EAP.

**Potential Labour risks:** Following are the potential risks associated with workers/labours engaged in execution of planned intervention works.

**Impact/Risks on Community**

1. Waste generation from labour colony can pollute drinking water sources of community

**Impacts/Risks for Workforce**

2. Safety issues while at work like injuries/accidents/ fatalities leading to even death, while at work;
3. Short terms effects due to exposure to dust and noise levels, while at work
4. Long term effects on life due to exposure to chemical /hazardous wastes
5. Inadequate accommodation facilities at work force camps, including inadequate sanitation and health facilities
6. Non-payment of wages
7. Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
8. Sexual harassment at work
9. Absence or inadequate or inaccessible emergency response system for rescue of labour/workforce in situations of natural calamities.
10. Health risks of labour relating to HIV/AIDS and other sexually transmitted diseases

*In addition, other risks that would be applicable for all types of workers would be as follows:*

1. Unclear terms and conditions of employment
2. Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
3. Denial for workers' rights to form worker's organizations, etc.
4. Absence of a grievance mechanism for labour to seek redressal of their grievances/issues

### **5.3 RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT (ESS 3)**

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#### **Impact on Physiography**

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The present interventions involve only civil and electromechanical works to improve dam safety. All the work will be carried out at one location i.e. at dam, therefore, physiography will not change due to any of the proposed interventions. There will be no significant impact on physiography of the region due to the proposed interventions.

#### **Impact on Land/Geology**

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All project components are proposed to happen within dam with no land acquisition. Therefore, impact on land and geology will be limited to sourcing of construction material or disposal of construction waste related only. The civil works will require different construction materials such as earth, aggregate, boulders, and sand. The requirement of such material is not large and will be sourced from already operational and approved mines/quarries. Sekmai is the nearest approved quarry area, which is about 35 Km from the site. The construction waste generation is also likely to be minimal and will be either reused or disposal for land filling or levelling purposes. However, requisite mitigation measures will be taken to minimise impact further.

The various 'resource efficacy' options during design include optimize usage of construction waste from repair activities and thereby reduce potential impact due to dumping etc., are considered to achieve minimum construction footprint.

### **Impact on Soil**

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The land where construction activities will take place will be directly impacted due to excavation, removal of topsoil, temporary storage of excavated material, etc. Other repair sites will also impact soil due to repair and demolition works such as upstream and downstream stone pitching, embankment of river bund, desilting of dam area, spillage during painting, operation of construction equipment and machinery and waste generation thereof, etc. There is also possibility of contamination of soil from leakage and spillage during handling and storage of fuels and chemicals.

### **Muck Disposal:**

The activities that generate construction debris and/or spoil are excavation, removal of damaged material, other repair and renovation activities as discussed above. This being largely repair work, quantities have not been estimated and they are not expected to be significant to create disposal problem. Nevertheless, all the construction debris/muck generated needs to be disposed off in a planned manner to avoid adverse impacts on soil.

### **Impacts on Water Resources**

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The proposed intervention activities are not expected to impact water resources in any way as the proposed interventions are neither crossing, altering or disturbing drainages nor impacting ground water resource in any form. Use of resources such as water and power will be optimised before start of work through Resource Efficiency and Pollution Prevention Plan.

### **Impacts on Water Quality**

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Construction related impacts and risks for water quality include:

- a) accidental release of fuel or chemicals and contamination from poor waste practices can affect surface and groundwater
- b) contamination from construction machinery working near water bodies
- c) discharges and disturbance of soil and sediment that drain into surface waters
- d) repair and construction work along river banks such as rip-rap replacement
- e) Generation of sanitary wastes from camp site and construction sites finding way to water bodies

### **Impact on Ambient Air Quality**

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As discussed in baseline, ambient air quality in the area is good due to absence of anthropogenic sources of air pollution. Construction activities will give rise to dust emissions if not effectively managed and have the potential to increase the pollution near to the main construction sites due to dust generated from demolition, excavation, operation of construction equipment and machinery, increased movement of vehicles, etc. Earth works will result in exposed areas of soil which will potentially generate dust when it is windy, with dust potentially being generated when winds blow at all times of day or night, not just during active periods of construction. The level and distribution of dust emissions will vary

according to the duration and location of activity, weather conditions, and the effectiveness of suppression measures.

Gaseous emission during construction will be from machinery, equipment and vehicles used for material transportation. The operation of vehicles and equipment will result in emissions of carbon monoxide, sulphur dioxide, and oxides of nitrogen. In particular, all commercial vehicle driven with diesel fuel is often used in India. The greatest impact on air quality due to emissions from vehicles and construction equipment will be in the areas immediately adjacent to work area and will affect the labour. Generally, additional vehicle movements generated during the construction phase will have the potential to influence local air quality at sensitive receptors located at close proximity to road. The impacts will therefore apply mostly to the habitation along the route to dam.

As the project is presently operational and the interventions are not going to alter the project operation in any manner, no operational phase impacts are envisaged on ambient air quality.

### **Impact of Noise and Vibration**

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Sources of noise will be the vehicles and equipment for construction at the project site. Due to construction activity in the area, noise levels will increase during the period of construction, however, they will remain limited to the work area mainly where construction activity will progress. Additionally, noise levels will increase on approach roads due to increased traffic.

Noise generation due to operation of construction machines and equipment will impact workers operating these machines and other who are working in the surrounding area. Such impacts can become significant if they are exposed to high noise for long hours continuously.

### **Impact of Waste Generation**

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Migratory population is expected to reside in the area during peak construction period. Proper sanitary and solid waste management facilities would be provided at the labour colonies. In the absence of proper solid waste management plan, there can be serious impacts of land and water pollution due to indiscriminate disposal. In addition, there will be odour issues and health impacts. There will be an influx of labourers and other service providers into the project area. Sewage and solid waste will be generated from the colony. It is essential that from the planning stage, sewage management and solid waste disposal facilities should be conceptualized to maintain the health of the people and the environment. Solid waste generated from the colonies during construction phase will be disposed off as per Solid Wastes Management Rules, 2016.

As most of the proposed activities involve repair and renovation, it is expected that construction and demolition waste in the form of debris will be generated. This being largely repair work, quantities have not been estimated and they are not expected to be significant to create disposal problem. Nevertheless, all the construction debris/muck generated needs to be disposed off in a planned manner to avoid adverse impacts on soil/land. All such wastes will be handled in compliance with Construction and Demolition Waste Rules, 2016.

Project interventions include substantial amount of electro-mechanical work such as Replacement and installation of Butterfly Valves and lift for operational service in the control shaft, Construction of generator shed i/c supplying, fixing, and commissioning of generator for operating the butterfly valve, Construction of Stainless Steel railing at Spillway and Top of Dam, etc. These activities will generate significant amount of waste in terms of replaced parts, packaging material, empty containers, use and disposal of oil & grease, iron scrap, etc. There will be a mix of hazardous and non-hazardous wastes. It is important to have a plan ready for disposal of such wastes before start of the activity. All such waste will be transported to WRD's stores about 40 kms from dam and will be disposed off as per the approved department process of auction /salvage.

Contractor is obliged to provide first-aid/basic medical facilities to labour at site especially during accident/emergency which is likely to generate bio-medical waste, although quantity is not expected to be significant, this needs to be managed to avoid indiscriminate dumping as impacts could be serious.

WRD along with contractor will prepare project specific muck / debris/Solid Waste disposal plan and provide sufficient site for such disposals.

#### **5.4 COMMUNITY HEALTH AND SAFETY (ESS 4)**

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Health safety and security risks and impacts on project affected communities especially on vulnerable people are not considered significant as communities are not directly involved or getting impacted. However, the project construction would involve engagement of labour, transportation and handling of material, civil construction and electromechanical works and such activities may impact the community and increase the risks.

Engagement of labour for project work and their stay at site for about 5 years' time, will increase the risks of crimes including gender based violence.

Waste generation from labour colony if not handled properly, will pollute the water resources used by community for drinking leading to health impacts. Migratory workforce may be bringing in new and infectious diseases not known to area.

Transportation of material will increase the traffic on village roads. Increased movement of traffic will impact the community by way of increased noise and air pollution. In addition, this will also increase the risk of accidents.

Similarly, civil construction and electromechanical works will lead to pollution generation in the form of air emissions and noise generation, which will remain local and are not expected to impact the community. Construction waste and electromechanical work waste, especially the hazardous waste if not disposed off properly have the potential of impacting the surrounding community.

As can be seen from the above discussion, the interventions proposed under Singda dam sub-project are of the nature of civil and electromechanical work, besides instrumentations. In case of structural interventions, there is no additional land requirement – neither forest nor private, as all the interventions remain within the close proximity to dam itself. Impacts/risks as assessed under ESIA study will remain limited to dam area except for procurement and transportation of material and labour habitation in the area, which have the potential of impacting community around the dam.

### **6.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

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E&S impacts/risks for this sub-project is Low risk, as identified in the previous chapter. These risks and impacts can be mitigated by appropriately implementing management measures. Based on the ESIA following plans/procedures have been identified to effectively mitigate the environment and social impacts and risks of the proposed interventions:

- ***Labour Management Procedure including GRM***

The Procedure will set out the way in which project workers will be managed, in accordance with the requirements of national law and the bank's ESS Standards and will address the way in which this ESS will apply to different categories of project workers. It covers the terms and conditions of employment, non-discrimination and equal opportunity, worker's organization and welfare. Protecting the workforce, establishing minimum age for labour to prevent child labour will be defined in the procedure. The responsibility to manage any adverse impacts would be clearly reflected in the contractual obligations of the Contractor with appropriate mechanisms for addressing non-compliance.

A grievance mechanism will be provided for all direct workers and contracted workers to raise workplace concerns and workers will be informed of the grievance mechanism at the time of recruitment along with the measures put in place to protect them against any reprisal for its use. Mechanism should be easily accessible to all project workers. It should be designed to address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned in a language they understand, without any retribution, and will operate in an independent and objective manner.

The document shall be prepared by Manipur WRD with support from the E&S staff and shall be applicable for both the projects taken under DRIP 2 in the state. It shall be disclosed by WRD one month before mobilization of the Contractor.

- ***OHS Measures***

Measures relating to occupational health and safety applies to the project as it involves engagement of workers. The OHS measures will take into account the General Environment

Health and Safety Guidelines and applicable legal requirements. The OHS measures will be designed and implemented to address:

- i. identification of potential hazards to project workers, particularly those that may be life threatening;
- ii. provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances;
- iii. training on occupational safety and health, and maintenance of training records
- iv. Provision of personal protective equipment without expense to the project workers.
- v. documentation and reporting of occupational accidents, diseases and incidents;
- vi. emergency prevention and preparedness and response arrangements to emergency situations;
- vii. remedies for adverse impacts such as occupational injuries, deaths, disability and disease
- viii. accident reporting and analysis procedure
- ix. system for regular review of OHS performance

The document shall be prepared by Manipur WRD with support from the E&S staff and shall be applicable for both the projects taken under DRIP 2 in the state. It shall be disclosed by WRD one month before mobilization of the Contractor.

- ***GBV Risk Mitigation Guidelines***

The proposed structural interventions are extremely localized in nature and will be carried out in areas of restricted access – as normally all dams are. These structural interventions will not result in any project interface with local communities, the overall GBV rating for this dam intervention as per the Risk Assessment Tool is low. Hence, in accordance with the overall GBV Risk Mitigation Framework for the project, guidelines will be developed commensurate to the low risk category to address Gender Based Violence Risk before invitation of bids. The Plan will provide a set of measures such as orientation to all categories of labour including department staff/dam site personnel. The document shall be prepared by Rajasthan WRD with support from the E&S Staff of Rajasthan WRD.

- ***Resource Efficiency and Pollution Prevention Measures***

Keeping in view the risks and impacts of the proposed activities, WRD will prepare a set of measures to be implemented by the Contractors to ensure efficient use of resources and avoid/minimize the pollution from proposed interventions. The measures should address all possible impacts identified above, with respect to resource use and pollution generation from civil works and electromechanical work and also from labour camps and colonies. It should focus on reuse/recycling; energy efficiency such as solar lights and cookers for colony/community kitchen for workers, where possible.

The project's demand for major raw material such as boulders, aggregate and sand for construction will be sourced through pre-existing authorized quarries, with valid environment clearance. To mitigate air and noise pollution from transportation, material storage and handling and construction activities, following measures should be included:

- To ensure trucks are loaded only up to permitted capacities to prevent high emission

- The ensure trucks used for transportation of material is covered by tarpaulin and provided tail board, so that en-route spillage and generation of fugitive dust are prevented.
- Vehicles in good condition with valid PUC (Pollution Under Control) certificate shall be deployed during construction
- Regular sprinkling of the water will be done on construction sites for dust suppression.
- Mobile DG sets shall be used for lighting only during construction phase and they should meet emission and noise standards as per guidelines/standards issued by CPCB.
- All the construction workers and other staff, who get directly exposed to dust, should necessarily be provided with dust masks. Workers in high noise area, will be provided with ear muffs and their use will be monitored. Workers exposure (time duration) to high noise will also be controlled.
- Minimize the use of noise producing equipment during night hours to avoid the disturbance to locals and wild animals of surrounding area.

To mitigate the risk of wastewater from construction site and colony finding its way to fresh water source without treatment, the following measures should be included:

- All toilets and wash areas in worker's colony should have functional septic tanks and soak pit arrangements, of adequate capacity.
- No discharge from oil/lube storage areas shall be directly discharged in to any open surface water channel/ streams.
- Construction along the river bank/reservoir shall be done when surface water level is receded and clear construction area is available.
- Storage of material and construction equipment should be kept away from the drainages to avoid any spillage and pollution of surface water.

For solid and hazardous waste management, sites should be identified for disposal of construction waste, surplus excavated material, and other solid wastes; and appropriate permissions taken for dumping with restoration plan covering engineering and biological measures as appropriate. No dump site shall be located in forest area. WRD will share identified locations of muck or debris disposal sites with the contractor. The contractor will develop a muck and debris disposal plan after incorporating longitudinal and cross section references to assess volume or capacity of the disposal site and will submit muck/ debris disposal plan before commencement of the work at site. This action needs to be included in the Bid Document as one of the key requirements.

WRD needs to prepare a plan to identify and quantify all the waste generated from electro-mechanical work include replaced parts with estimated quantities and categorisation as hazardous and non-hazardous waste. The plan should also identify the temporary secured and covered storage location till the time it is removed, contractors/vendors who will pick these parts/wastes; authorisation status of contractors for hazardous wastes.

Measures should also cover cleanliness of the labour colony, provision of basic solid waste collection facilities and restrict dumping of solid waste on land or in water body. Contractor should provide bins for dumping of domestic waste from colony and ensure timely pick up and dumping at authorised location.

The document shall be prepared by Manipur, WRD with support from the E&S Staff and shall be applicable for both the projects taken under DRIP 2 in the state. It shall be disclosed by WRD one month before mobilization of the Contractor.

- ***Procedures for Stakeholder Engagement***

The Stakeholder Engagement Framework (SEF) will describe the timing, methods of engagement with stakeholders and range of information, distinguishing between project-affected parties and other interested parties, as well as the type of information to be sought from them. The procedures developed based on SEF will set out how stakeholders will be engaged throughout project preparation and implementation and describe the measures that will be used to remove obstacles to participation, and how the views of differently affected groups will be captured. Where applicable, the procedures will include differentiated measures to allow the effective participation of those identified as disadvantaged or vulnerable. The draft Framework will be prepared by CWC in discussion with Manipur WRD and will be disclosed. The Stakeholder Engagement Procedures will be developed specific to the proposed interventions at the site, prior to invitation of bids.

- ***Institutional Arrangement***

As part of institutional strengthening for implementation of sub-projects, Environmental and Social staff will be engaged by the department to enable preparation of management plans as well subsequent implementation of mitigation measures during implementation. IA will hire experts from outside department or seek deputation of staff with relevant experience.

- ***Grievance Mechanism***

WRD shall establish and implement a grievance mechanism to receive and facilitate resolution of concerns and grievances, from the communities and other stakeholders including implementation partners. It shall be proportionate to the potential risks and impacts of the project and be accessible and inclusive. The department will establish three levels of Grievance Mechanism:

1. A cell at each of the dam site headed by respective Executive Engineer
2. A cell at the SPMU headed by CE/PD
3. A committee at the state government level headed by Secretary to Government

Details on the processes and procedures for the GRM will be provided in the Stakeholder Engagement Framework.

## **6.2 MONITORING REPORTING AND BUDGETING**

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SPMU will prepare a monitoring, reporting and budgeting requirement to implement above plans and measures, which will be approved by CPMU - CWC. SPMU will prepare a quarterly monitoring report and submit to CPMU - CWC.

### **6.3 ENVIRONMENTAL AND SOCIAL COMMITMENT PLAN (ESCP) AND OTHER REQUIREMENTS**

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WRD, Manipur will agree on an Environmental and Social Commitment Plan (ESCP) with the Bank covering the material measures and actions that are required for the project to achieve compliance with the ESSs over a specified timeframe. It will take into account the findings of the environmental and social assessment, the Bank's environmental and social due diligence and the results of engagement with stakeholders. ESCP will clearly spell out the plans to be prepared with time frame and responsibility.

**Annexure I**  
**Socio-economic Profile of Proximity villages (Study Area)**

Study area is defined as proximity villages i.e. villages which fall within 5 km distance from dam on downstream side. These are Singda, Kangchup Geljang, Kangchup Patbung, Kangchup Khomunnom, Kangchup Tuikon and Bethel.

**A. Demography of Study Area**

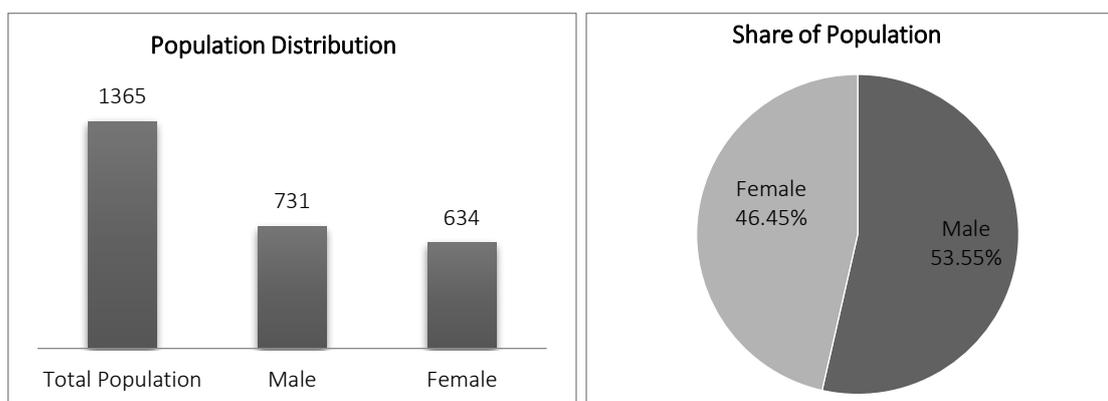
S. No.	Description	Number	Percentage to Respective Total
1	<b>Total Population</b>	<b>1,365</b>	<b>100.0</b>
	Male	731	53.55
	Female	634	46.45
	Sex Ratio	<b>867</b>	
2	<b>Population (0-6 age group)</b>	<b>186</b>	<b>100.0</b>
	Male	109	58.60
	Female	77	41.40
	Child Sex Ratio	<b>706</b>	
3	<b>Scheduled Tribe (ST) Population</b>	<b>1,282</b>	<b>100.0</b>
	Male	657	51.25
	Female	625	48.75
	Sex Ratio	<b>951</b>	
4	<b>General Category (Including OBC)</b>	<b>83</b>	<b>100.0</b>
	Male	74	89.16
	Female	09	10.84
	Sex Ratio	<b>122</b>	
5	<b>Total No. of Households</b>	<b>260</b>	
	Average Household Size	5	
6	<b>Total Literates</b>	<b>1,061</b>	<b>100.0</b>
	Male	582	54.85
	Female	479	45.15
	<b>Overall Literacy Rate</b>	<b>89.99</b>	
	Male Literacy Rate	93.57	
	Female Literacy Rate	86.00	
	Gender Gap in Literacy Rate	7.57	
7	<b>Total Workers</b>	<b>752</b>	<b>100.0</b>
	Male	449	59.71
	Female	303	40.29
	Gender Gap in Work Participation Rate	19.42	
8	<b>Main Workers</b>	<b>585</b>	<b>100.0</b>
	Male	385	65.81
	Female	200	34.19
	Gender Gap in Work Participation Rate	31.62	
9	<b>Marginal Workers</b>	<b>167</b>	<b>100.0</b>
	Male	64	38.32

	Female	103	61.68
	Gender Gap in Work Participation Rate	-23.36	
10	<b>Household Industrial Workers</b>	<b>11</b>	<b>100.0</b>
	Male	03	27.27
	Female	08	72.73
11	<b>Cultivators</b>	<b>462</b>	<b>100.0</b>
	Male	244	52.81
	Female	218	47.19
12	<b>Agricultural Labour</b>	<b>107</b>	<b>100.0</b>
	Male	62	57.94
	Female	45	42.06
13	<b>'Other Workers'</b>	<b>172</b>	<b>100.0</b>
	Male	140	81.40
	Female	32	18.60

*Source: Census of India, 2011*

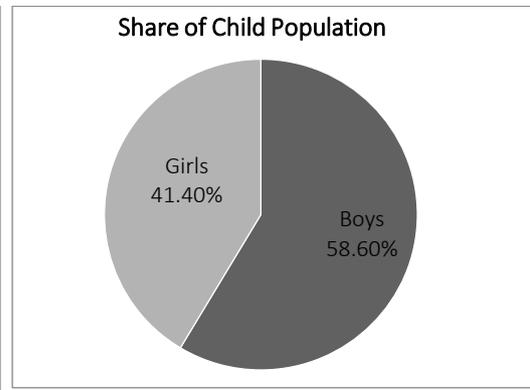
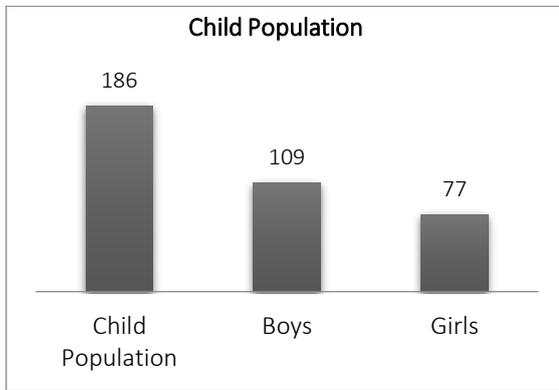
## B. Population Composition

According to above table, the data reveals that total population of the study area has been worked out to 1,365. The gender wise distribution of the above population is 731 (53.55%) male and 634 (46.45%) female. The overall sex ratio of the study area has been worked out to 867 females per 1,000 males. The entire population of the study area is distributed into approx. 260 households and the average household size is five.



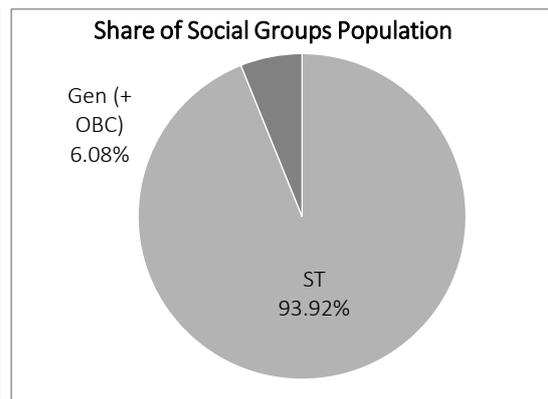
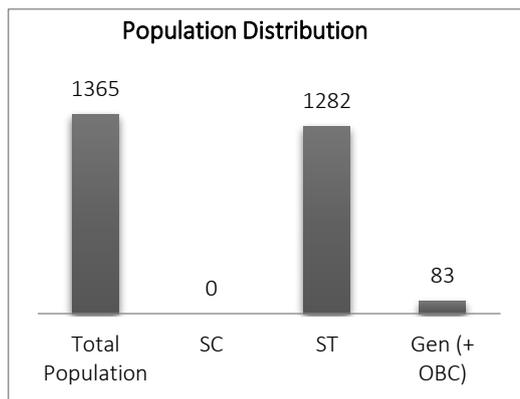
## C. Child Population Distribution

In the study area, the total child population of 0-6 age group has been worked out to 186 which represent 13.63% of the total population. Of the total child population, 58.60 % are boys and remaining 41.40% are girl child. The child sex ratio in this age group is 706 girls per 1,000 boys.

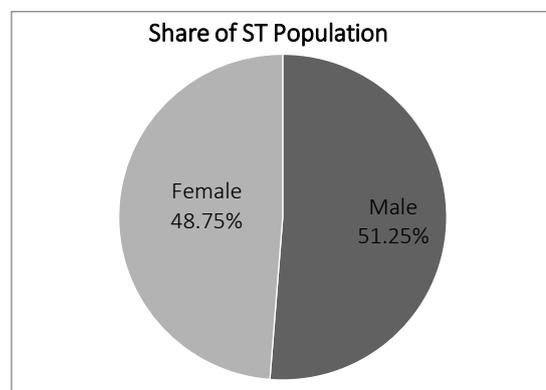
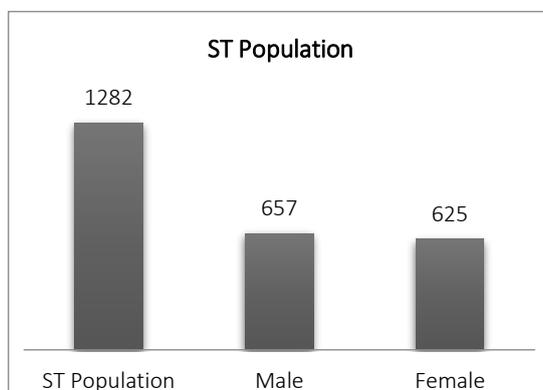


#### D. Social Group Population Distribution

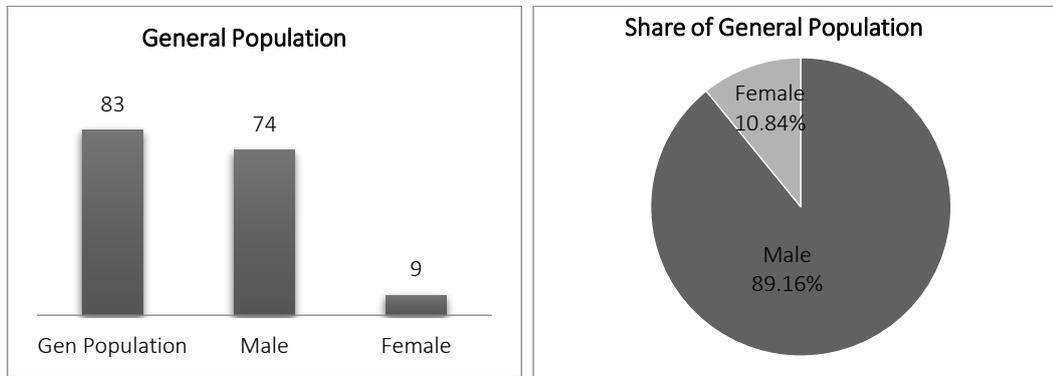
Total population of the study area is distributed into different social groups like Scheduled Tribe (ST) and General Category (including OBC). The share of these social groups' population to the total population of the study area is 93.92% and 6.08% respectively. There is no population belonging to Scheduled Caste category in proximity area.



- Scheduled Tribe Population:** The Scheduled Tribe population in the study area has been worked out to 1,282 which represent 93.92% of the total population. Of the total Scheduled Tribe population, 51.25% is male and 48.75% is female. The sex ratio among the Scheduled Tribe population has been worked out to 951 females per 1,000 males.

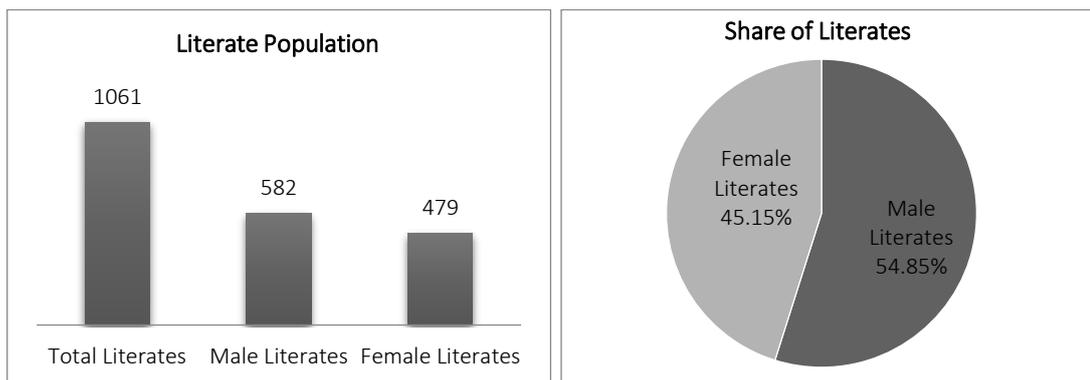


- General Category (including OBC) Population:** The population of this group has been worked out to only 83 which is just 6.08% of the total population of the study area. Of this, 89.16% is male and 10.84% is female. The sex ratio among this group of population has been worked out to only 122 females per 1,000 males which are not significant.



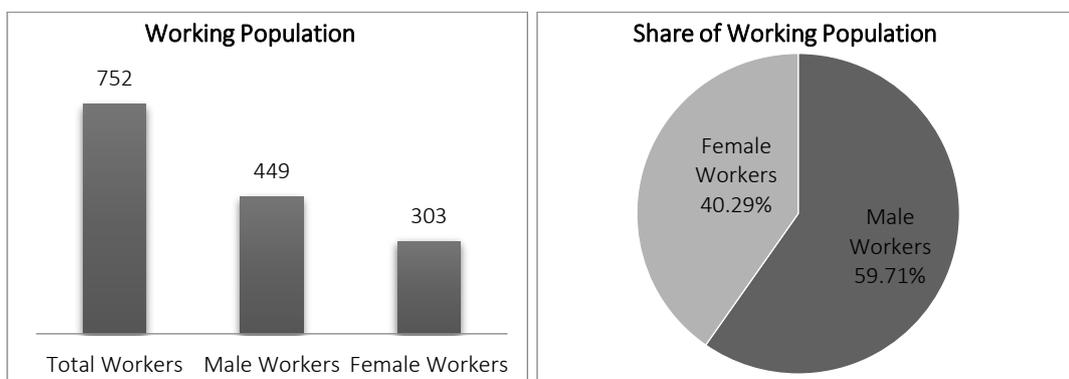
### E. Literates, Literacy Rate and Gender Gap in Literacy Rate

In the study area, 77.73% of the population is literate in which male literates are 54.85% and that of females are 45.15%. The overall literacy rate in the study area has been worked out to 89.99%. The male literacy rate is 93.57% and female literacy rate is 86.00%, creating a gender gap in literacy rate of 7.57%.



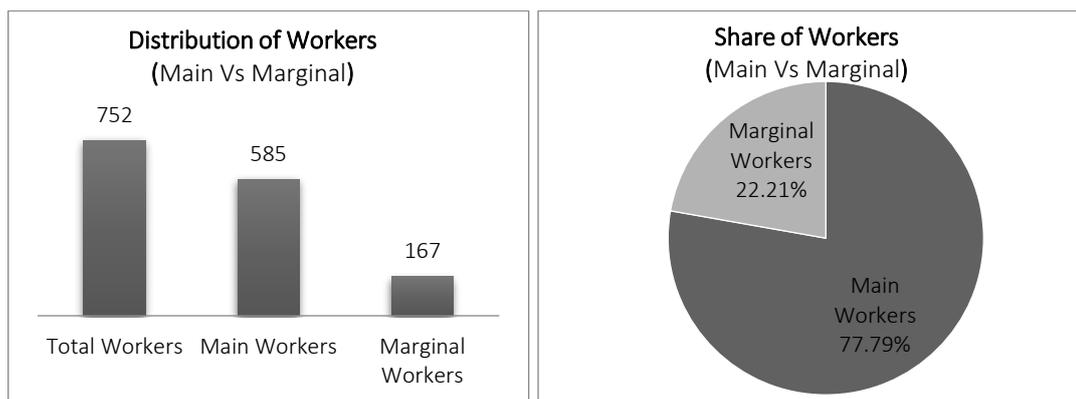
### F. Workers and Work Participation Rate

The economic classification of workers as per Census 2011 is saying that total number of workers in the study area is 752 which constitute 55.09% of the total population. Of the total workers, 59.71% are males and remaining 40.29% are females. In absolute term, total number of male workers is 449 and that of female is 303. The gender gap in work participation rate is 19.42%.

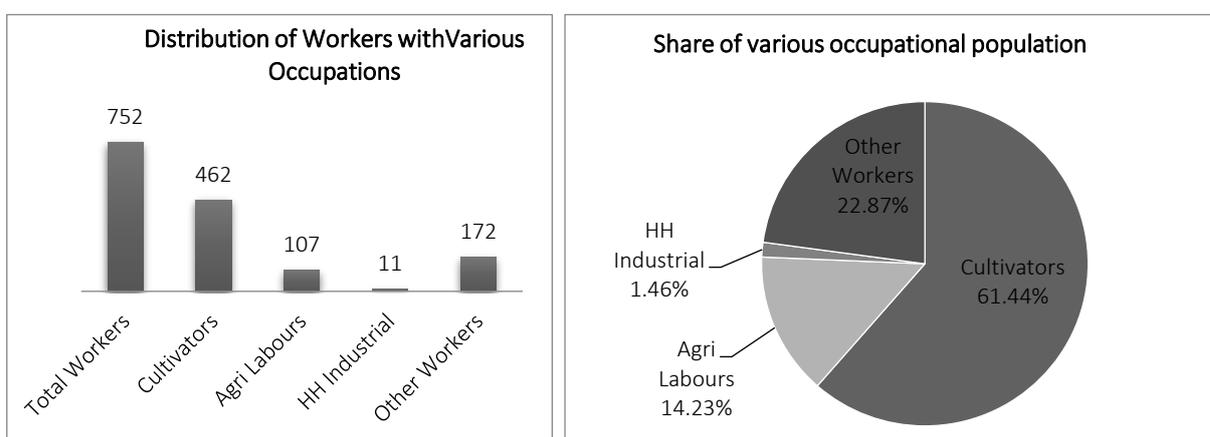


Further of the total workers, 77.79% are main workers and remaining 22.21% are marginal workers. Of the total main workers, 65.81% are male and remaining 34.19% are female which creates a gender gap in work participation rate of 31.62%. In case of marginal workers,

38.32% are male and 61.68% are female that creates a gender gap of minus (-) 23.36% in this segment of work participation.



The workers are further divided into Cultivators, Agricultural Labours, Household Industrial Workers and 'Other Workers'. Their shares in the total workers are 61.44%, 14.23%, 1.46% and 22.87% respectively.



Agriculture is the main source of livelihood in the study area followed by 'Other Workers' and 'Household Industrial Workers'. Rice, Maize, Potato, Cabbage and cereals are the major agricultural products in the study area. Terrace cultivation is generally practice by the people.

'Household Industrial Workers' who is part of the small scale establishments run as a household industry involving production & manufacturing of handloom and handicraft products which is the only important industry with regard to employment potential particularly females. Bed shits, phaneks, mosquito nets, bamboo baskets, mats, fishing nets, furniture, carpentry products, pottery articles etc. are some of the notable products manufacturing by the people of the area.

'Other Workers' which include those activities engaged as government servants, municipal employees, teachers, construction workers, entertainment artists, trade, commerce, business, transport, banking etc.

## G. Basic Amenities

The basic amenities like education, health, drinking water, electricity, approach road, transportation and other facilities available in the study area are given in the following table:

<b>Basic Amenities Available in the Study Area</b>		
<b>EDUCATION</b>		
Educational Institutions	<b>Type of Educational Institutions</b>	<b>Number</b>
	Pre-primary School (Govt.)	03
	Primary School (Govt.)	03
	Middle School (Govt.)	01
<b>WATER</b>		
Means of Drinking Water	Tank	
	Tube wells	
<b>ELECTRICITY</b>		
Types of Electricity Available	Power for Domestic Uses	
	Power for Agriculture Uses	
	Power for Commercial & Industrial Uses	
<b>ROAD</b>		
Types of Approach Roads	Black Topped (Paved/Pucca) Road	
	Gravel (Mud/Kachcha) Road	
	Footpath Road	
<b>TRANSPORTATION</b>		
Types of Road Transportation Available	Private Bus Services	
	Auto/Modified Autos	
	Taxi Services	
<b>OTHER AMENITIES</b>		
Other Amenities	Open Drainage System	
	Self-help Group	
	Nutritional Centre (Anganwadi)	
	ASHA	
<i>Source: Census of India, 2011</i>		

Basic amenities like water supply for drinking and other uses are available from Tank and Tube wells etc. Electricity is available for domestic, agriculture, commercial & industrial uses in almost all over the study area. The study area having approach roads as Black Topped (Paved), Gravel (Kachcha) and Footpath. As per the census data, a deficiency in health & educational institutions & facilities are observed in the proximity area/villages.